City of Irwindale

Irwindale Materials Recovery Facility and Transfer Station Project Environmental Impact Report

Appendix A – Project Scoping Materials

Print Form

Appendix C

~~Notice of Completion &~~ Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Athens Services Materials Recovery Facility and Transfer Station (MRF/TS)

Lead Agency: City of Irwindale
Contact Person: Paula Kelly
Mailing Address: 5050 N. Irwindale Avenue
Phone: (626) 430-2200
City: City of Irwindale Zip: 91706
County: Los Angeles

Project Location: County: Los Angeles City/Nearest Community: Irwindale, Baldwin Park
Cross Streets: NW corner of Live Oak Avenue and Arrow Highway Zip Code: 91706
Longitude/Latitude (degrees, minutes and seconds): 34 ° 6 ′ 15 ″ N / 117 ° 58 ′ 00 ″ W Total Acres: 17.22 Acres
Assessor's Parcel No.: 8535-001-911 Section: 6 Twp.: 1S Range: 10W Base: SBD
Within 2 Miles: State Hwy #: I-605 and I-210 Waterways: San Gabriel River
Airports: None Railways: Southern Pacific Schools: Heath, Landis, Geddes

Document Type:

CEQA: ☒ NOP ☐ Draft EIR
☐ Early Cons ☐ Supplement/Subsequent EIR
☐ Neg Dec (Prior SCH No.) _____
☐ Mit Neg Dec Other: _____

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI

Other: ☐ Joint Document ☐ Final Document ☐ Other: _____

Local Action Type:

☐ General Plan Update ☒ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☒ Site Plan
☒ Rezone ☐ Prezone ☒ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☐ Other: ZOA/DDA/FFOA

Development Type:

☐ Residential: Units _____ Acres _____
☐ Office: Sq.ft. _____ Acres _____ Employees _____
☐ Commercial: Sq.ft. _____ Acres _____ Employees _____
☒ Industrial: Sq.ft. 246,022 Acres 17.22 Employees 85
☐ Educational: _____
☐ Recreational: _____
☐ Water Facilities: Type _____ MGD _____

☐ Transportation: Type _____
☐ Mining: Mineral _____
☐ Power: Type _____ MW _____
☐ Waste Treatment: Type _____ MGD _____
☐ Hazardous Waste: Type _____
☒ Other: MRF/TS, up to 6,000 Tons/day

RECEIVED
4:40 pm
MAY 10 2013
STATE CLEARING HOUSE

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☐ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☒ Biological Resources ☐ Coastal Zone ☒ Drainage/Absorption ☐ Economic/Jobs
☐ Fiscal ☒ Flood Plain/Flooding ☐ Forest Land/Fire Hazard ☒ Geologic/Seismic ☒ Minerals ☒ Noise ☒ Population/Housing Balance ☒ Public Services/Facilities
☒ Recreation/Parks ☐ Schools/Universities ☐ Septic Systems ☐ Sewer Capacity ☒ Soil Erosion/Compaction/Grading ☒ Solid Waste ☒ Toxic/Hazardous ☒ Traffic/Circulation
☐ Vegetation ☒ Water Quality ☒ Water Supply/Groundwater ☐ Wetland/Riparian ☒ Growth Inducement ☒ Land Use ☒ Cumulative Effects ☒ Other: Env. Justice

Present Land Use/Zoning/General Plan Designation:

Vacant and disturbed / Heavy Manufacturing / Commercial

Project Description: *(please use a separate page if necessary)*

Athens Services (Applicant/Operator) has submitted an application to the City of Irwindale (City) to construct and operate a Materials Recovery Facility and Transfer Station (MRF/TS), with a Fueling Facility/Convenience Store (see NOP attached, figure 1 - 4). A MRF/TS is a facility where residential, commercial, and/or industrial municipal solid waste and recyclable materials are delivered by commercial and non-commercial haulers, and sorted and processed in one central location prior to delivery at end use distributors.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Revised 2010

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

X	Air Resources Board		Office of Historic Preservation
	Boating & Waterways, Department of		Office of Public School Construction
	California Emergency Management Agency		Parks & Recreation, Department of
	California Highway Patrol		Pesticide Regulation, Department of
X	Caltrans District # 7		Public Utilities Commission
	Caltrans Division of Aeronautics	X	Regional WQCB # 4
	Caltrans Planning		Resources Agency
	Central Valley Flood Protection Board		Resources Recycling and Recovery, Department of
	Coachella Valley Mtns. Conservancy		S.F. Bay Conservation & Development Comm.
	Coastal Commission	X	San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
	Colorado River Board		San Joaquin River Conservancy
X	Conservation, Department of		Santa Monica Mtns. Conservancy
	Corrections, Department of		State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of		SWRCB: Water Quality
	Energy Commission		SWRCB: Water Rights
X	Fish & Game Region # 5		Tahoe Regional Planning Agency
	Food & Agriculture, Department of		Toxic Substances Control, Department of
	Forestry and Fire Protection, Department of		Water Resources, Department of
	General Services, Department of		
	Health Services, Department of		Other:
	Housing & Community Development		Other:
X	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date May 13, 2013 Ending Date June 12, 2013

Lead Agency (Complete if applicable):

Consulting Firm:
Address:
City/State/Zip:
Contact:
Phone:

Applicant: Athens Services
Address: 5355 Vincent Avenue
City/State/Zip: Irwindale, CA 91706
Phone: (626) 336-3636

Signature of Lead Agency Representative: J. Harris **Date:** May 10, 2013

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

NOTICE OF PREPARATION

TO: State Clearinghouse
Governor's Office of Planning and Research
Post Office Box 3044
1400 Tenth Street
Sacramento, California 92512-3044
-AND-
Agencies, Organizations, and Interested Parties

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report

The City of Irwindale is the Lead Agency under the California Environmental Quality Act (CEQA), and will prepare an Environmental Impact Report (EIR) for the project described below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and potential environmental effects are contained in the attached materials. [CEQA Guidelines §§15082(a), 15103, 15375]. Because the City has determined that an EIR is required, an Initial Study has not been prepared (CEQA Guidelines §15063(a)).

PROJECT TITLE: *Irwindale Materials Recovery Facility and Transfer Station*

PROJECT APPLICANT: Athens Services

PROJECT LOCATION:
The proposed *Irwindale Materials Recovery Facility and Transfer Station* (Project) is located at 2200 Arrow Highway, at the northwestern intersection of Live Oak Avenue and Arrow Highway, within the City of Irwindale. The project site is approximately 17.22 acres (Assessor's Parcel Number 8535-001-911; see **Figure 1: Vicinity Map**).The project site is currently zoned for Heavy Manufacturing and is designated for commercial land use in the City's General Plan. The project site is located in an industrial area, with various commercial/industrial, residential, and recreational land uses in surrounding areas.

The irregular–shaped, triangular project site is unimproved, and is bordered on the south by Live Oak Avenue, on the east by the Santa Fe Dam and property owned by the U.S. Army Corps of Engineers (USACE), on the northeast by Arrow Highway, and

on the west and northwest by an existing business/industrial parking lot. The project site is crossed by a City of Los Angeles Department of Water and Power (LADWP) electricity transmission easement along the south side totaling approximately 2.84 acres of the total site area. In addition, Southern California Edison (SCE) Company holds a 23-foot-wide utility easement totaling approximately 0.5 acres along the entire length of the project site frontage on Arrow Highway.

On the north side of Arrow Highway is the Santa Fe Dam and Santa Fe Dam Recreation Area. To the southwest of the project site, also on the far side of Live Oak Avenue and in the City of Baldwin Park, is a Waste Management Corporation yard. To the south of the project site on the south side of Live Oak Avenue is a Valley County Water District storage facility in the City of Baldwin Park.

PROJECT DESCRIPTION:

Athens Services (Applicant/Operator) has submitted an application to the City of Irwindale (City) to construct and operate a Materials Recovery Facility and Transfer Station (MRF/TS), with a Fueling Facility/Convenience Store (see **Figure 2: Site Plan**). A MRF/TS is a regional facility where residential, commercial, and/or industrial municipal solid waste and recyclable materials are delivered by commercial and non-commercial haulers, and sorted and processed in one central location prior to delivery at end use distributors. The application requires a General Plan Amendment, Zone Change, Zoning Ordinance Amendment, Site Plan and Design Review Permit, Sale/Disposition and Development Agreement, Conditional Use Permit, Franchise and Facility Operations Agreement, and environmental review subject to the California Environmental Quality Act (CEQA).

Athens Services has identified the following objectives for development of the proposed MRF/TS:

- Assist the City of Irwindale and surrounding communities to achieve and surpass existing and foreseeable future waste reduction and diversion goals and mandates;
- Provide additional processing capacity to increase diversion of recyclable commodities from the mixed municipal waste stream, thereby reducing the consumption of landfill capacity and prolonging the operational period of the region's current permitted landfill capacity;
- Provide replacement capacity for the management and processing of a portion of the green waste presently managed by Puente Hills Landfill (planned closure date November 1, 2013);
- Provide processing and diversion of a portion of construction and demolition debris presently deposited at the Puente Hills Landfill;
- Facilitate the consolidation of residual wastes destined for final landfill disposal and recyclable commodities destined for re-use from small vehicles to larger transport vehicles in order to reduce traffic on the regional transportation network and reduce net air emissions;

- Provide a disposal outlet accessible to waste haulers and generators during non-peak traffic hours in order to reduce traffic loading to area roads during peak hours;
- Provide state-of-the-art waste processing to achieve objectives with minimum impacts;
- Construct the facility at an optimal location that minimizes the effect of traffic on local communities and reduces truck travel on area roadways; and
- Provide a convenient and easily accessible recycling and disposal site for self-haul materials.

The MRF/TS facility would be located in a fully enclosed structure designed to control odors, dust, and litter. The MRF/TS would receive, process, and transfer mixed municipal solid waste (MSW), green waste (GW), construction and demolition (C&D) materials, and waste hauled in by self-haulers. The MRF/TS would be open for waste receipt 24 hours per day, seven days per week. MRF/TS operations would consist of sorting, consolidating, and compacting received materials, and then re-loading all recyclable, compostable, and solid waste material into transfer trucks for transport to additional processing and/or disposal facilities (end use distributors).

As designed, the MRF/TS facility would have the maximum capacity to process up to 3,000 tons per day (tpd) of MSW, 1500 tpd of GW, 1500 tpd of C&D, and 750 tpd self-haul. While the permitted maximum capacity would be 6,000 tpd, the sum of the upper end values for each waste type equals 6,750 tpd. In order to stay within the permit limit, if a higher volume of one type of waste is received, the facility will accept a smaller volume of another type of waste. Actual processing volume per day will depend on a number of different market factors. The facility would also have a load checking program, per Title 14 California Code of Regulations Section 17409.5. Hazardous wastes will be prohibited at the MRF/TS.

The MRF/TS would consist of one large, fully enclosed building with the interior designed to provide separate areas for the receipt and processing of the different waste materials (MSW, GW, C&D materials, and self-haul waste). A below-grade load-out tunnel approximately 45 feet wide and 15 feet tall would be constructed along the northwest side of the MRF/TS building to accommodate three lanes of traffic. Truck axle scales will be installed beneath each of the four planned load-out ports (two ports for MSW, and one port each for GW and C&D debris).

In addition to the MRF/TS, on-site improvements include operations offices, administrative offices and visitor center, maintenance facility, scale houses, and a fueling facility/convenience store open to the public. The fueling facility/convenience store would be a separate structure located in the northeastern portion of the project site adjacent to Arrow Highway and includes a fueling island with pump canopy, convenience store, and parking for customers. Administrative offices, visitor's center, and equipment maintenance facilities will be housed in a building located along Arrow Highway and to the east of the MRF/TS building. The equipment maintenance portion of the building will provide areas for maintenance of the transfer trucks and heavy

equipment servicing the facility. The maintenance area will contain maintenance bays, a wash bay, and storage. Building element specifics are provided below in **Table 1 – Proposed Project Building Specifications**.

Table 1 – Proposed Project Building Specifications	
Project Building Elements	**Specifications (square feet)**
Materials Recovery Facility / Transfer Station	82,593
Green waste	65,483
Self-haul and Construction & Debris	73,270
Operations	6,636
Maintenance Building	9,800
Administrative / Visitor Center	5,400
Scale Houses	450
Convenience Store	2,390
Total Area	**246,022**
Parking Provided	
Standard parking stalls	246
Handicap-accessible parking stalls	4
Convenience store standard parking stalls	9
Convenience store handicap-accessible parking stalls	2
Total Parking Stalls	**261**
Transfer truck stalls (12'x80')	24

Project Variant

On the far eastern corner of the site, the Valley County Water District (VCWD) has expressed interest in acquiring 1.9 acres for placement of two water storage tanks. This section of the project site, owned by the City of Irwindale, is referred to as the "project variant." In the event that VCWD does acquire the 1.9 acres, the project site would not be able to accommodate the required overnight parking for transfer trucks or the administrative office/maintenance building. In that event, the Applicant would need to hire sub-hauler vendors for all transfer truck operations, and the office/visitors' center would be incorporated into the main MRF/TS building. Building element specifics are provided below in **Table 2 – Project Variant Building Specifications.** (See **Figure 3: Project Variant Site Plan**).

Under this alternative development option, the MRF/TS facility would essentially be the same as the proposed project described above, except that due to the reduced acreage available, there would be no transfer trucks parked or maintained at the facility. In the absence of the on-site parking and maintenance facility for Applicant-owned transfer trucks, all transfer truck operations would be supplied via various sub-hauler vendors and similar contract arrangements.

Table 2 – Project Variant Building Specifications	
Project Building Elements	**Specifications (square feet)**
Materials Recovery Facility / Transfer Station	82,593
Green waste	65,483
Self-haul and Construction & Debris	73,270
Operations / Administrative / Visitor Center	6,400
Scale Houses	600
Convenience Store	2,390
Total Area	**233,906**
Parking Provided	
Standard parking stalls	161
Handicap-accessible parking stalls	6
Convenience store standard parking stalls	9
Convenience store handicap-accessible parking stalls	2
Total Parking Stalls	**178**

Parking and Circulation

Design of the parking stall size and driveways would be built to City and Fire Department standards. Primary access for transfer trucks to and from the project site would be from Arrow Highway, and directed towards Interstate 605 for regional transport exclusively utilizing City of Irwindale roadways including Live Oak Avenue, Arrow Highway, and Rivergrade Road. Two additional access points to the south from Live Oak Avenue will serve for employees, visitors and Fire Department access only. Site access into the Fueling Facility/Convenience Store area would be located on Arrow Highway.

Design and Landscaping

The exterior design of the facility buildings would be consistent with the City's *Commercial and Industrial Design Guidelines*, including varying parapet heights, vertical tower elements, arcades, arched entry structures, and deeply recessed exterior fenestrations.

Landscaping would be developed to screen the site perimeter and throughout the MRF/TS facility with particular focus on the public view areas. In addition, a decorative concrete block wall would be constructed with wrought iron gates at facility access points. The site would have secured perimeter fencing and/ or a block wall along the entire property boundary.

Construction Schedule

The MRF/TS and Fueling Facility/Convenience Store project would be constructed in a single phase estimated to require 18 months. An average daily construction crew of 84 employees would be present on-site during construction.

POTENTIAL ENVIRONMENTAL EFFECTS: Based upon the City's preliminary assessment, potential environmental effects may involve the following resource areas that are planned to be addressed in the EIR. Topics to be discussed may include, but are not limited to:

- Aesthetics;
- Air quality and greenhouse gas emissions;
- Biological resources;
- Cultural resources;
- Environmental justice;
- Geology and soils;
- Hazards and hazardous materials;
- Land use;
- Noise;
- Public services and utilities;
- Transportation and circulation;
- Water quality and hydrology; and
- Alternatives to the Project.

PUBLIC SCOPING PERIOD: The City will accept written comments for the NOP regarding of the scoping of the EIR between May 13, 2013 and June 12, 2013. (State CEQA Guidelines §§15082-15083).

RESPONSES AND COMMENTS: Comments regarding the scope and content of the EIR are welcomed. *Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than the close of the 30 day comment period* (June 12, 2013). We will need the name for a contact person in your agency.

Please send written comments to:

Ms. Paula Kelly, Senior Planner
5050 North Irwindale Avenue
Irwindale, California 91706

Your comments may also be sent via fax to (626) 962-2018 or by email to: paulakelly@ci.irwindale.ca.us

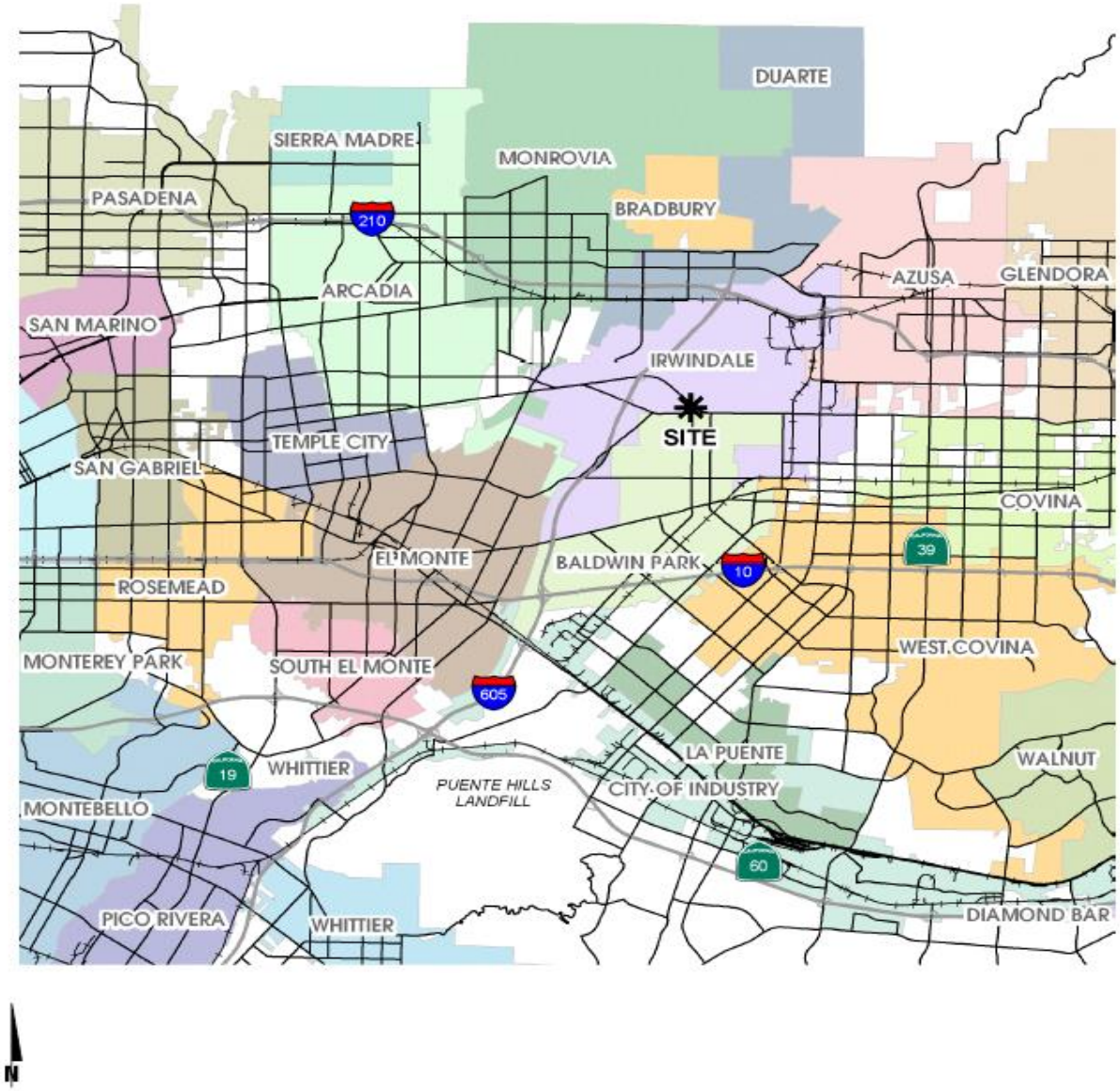
Date: 05-09-13_____

Signature: Original signed by ***Paula Kelley***_

Title: **Senior Planner**_____

Telephone: **(626) 430-2209**_____

Figure 1: Regional Location Map



Athens Services Traffic Impact Analysis
City of Irwindale, CA (JN - 06625:01)

Figure 2: Vicinity Map



Figure 3: Site Plan

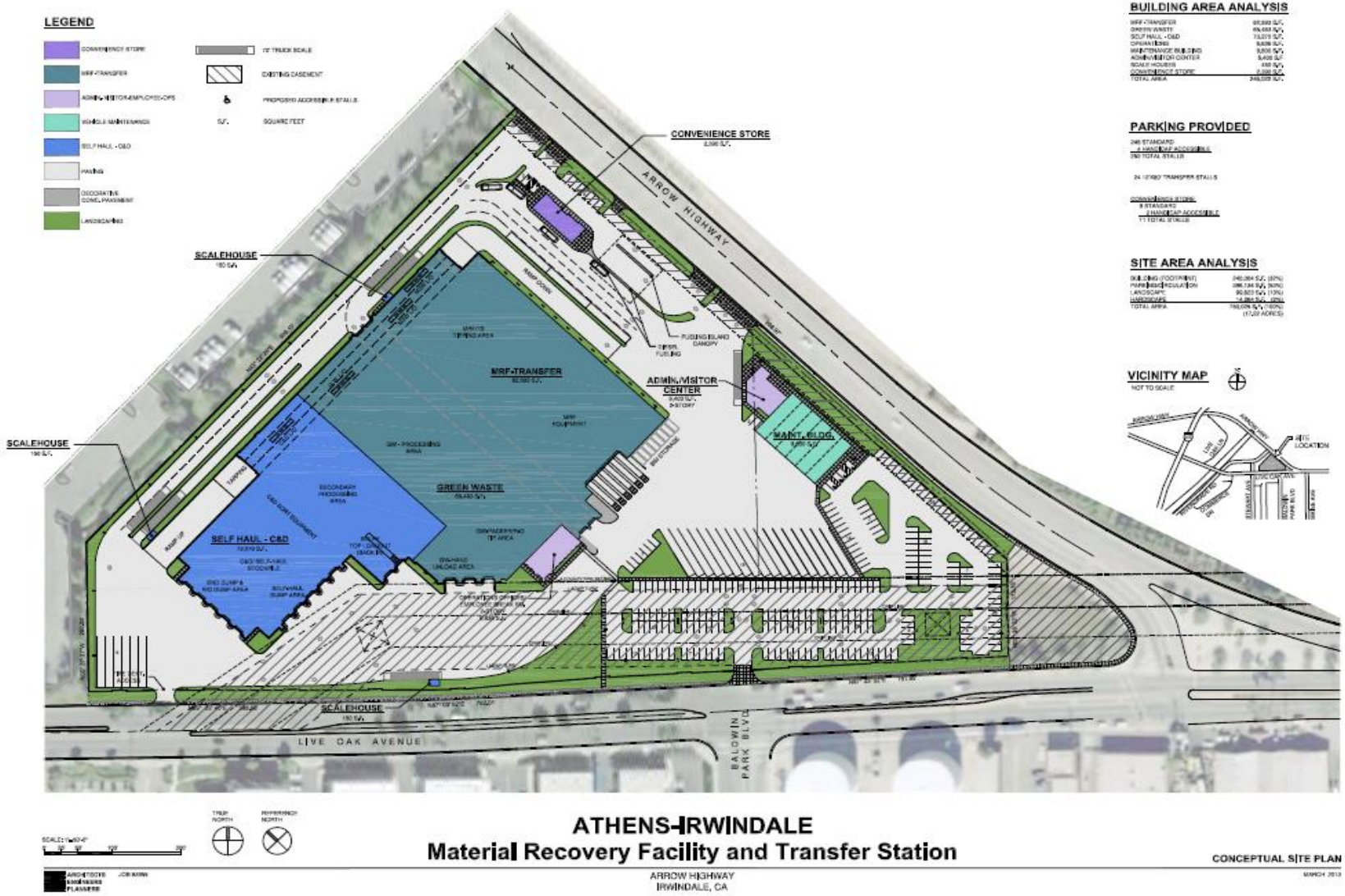
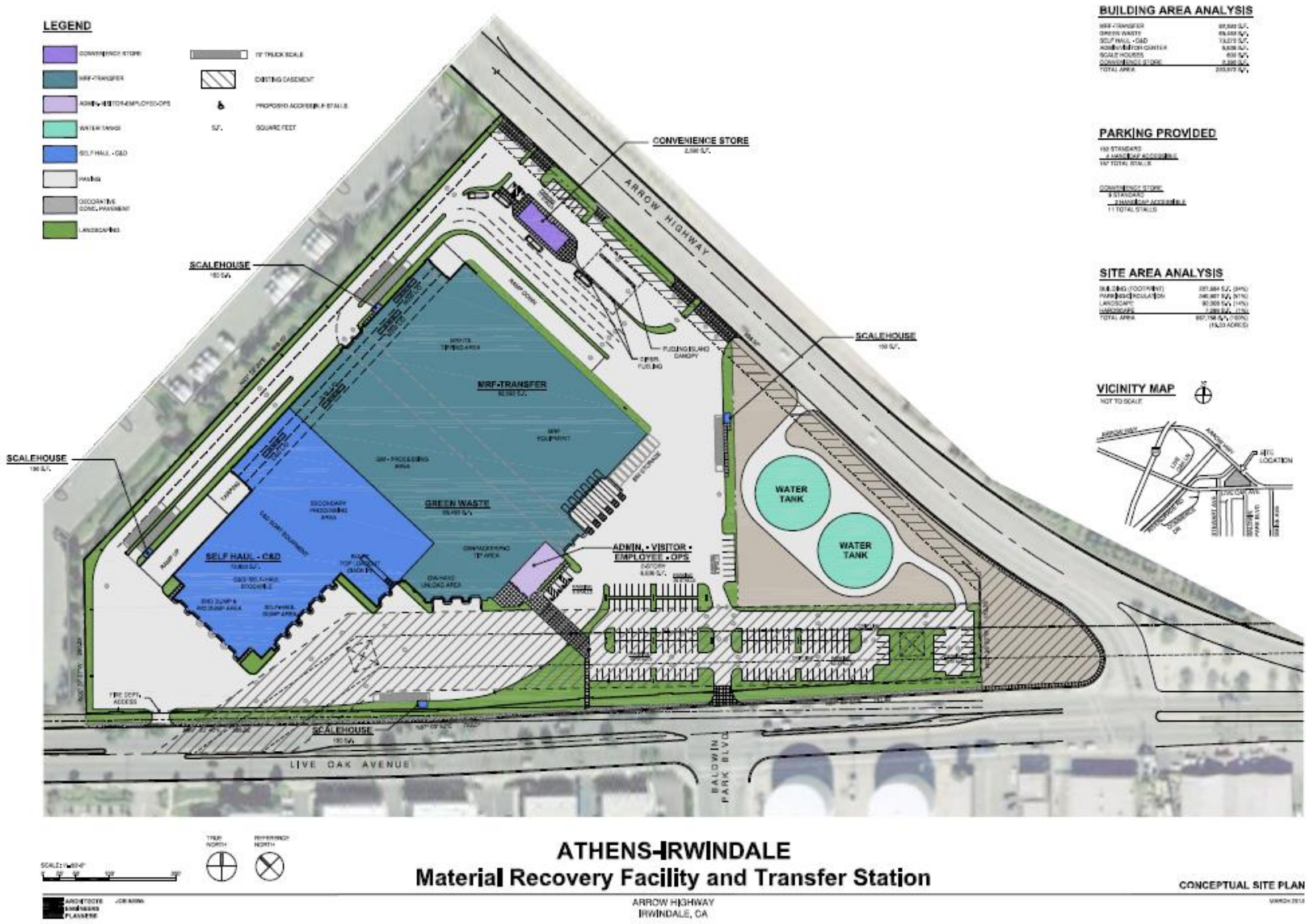


Figure 4: Site Plan Project Variant





Athens Services Materials Recovery Facility and Transfer Station (MRF/TS)

SCH Number: 2013051029

Document Type: NOP - Notice of Preparation

Project Lead Agency: Irwindale, City of

Project Description

Athens Services (Applicant/Operator) has submitted an application to the City of Irwindale (City) to construct and operate a Materials Recovery Facility and Transfer Station (MRF/TS), with a Fueling Facility/Convenience Store (see NOP attached, figure 1 - 4). A MRF/TS is a facility where residential, commercial, and/or industrial municipal solid waste and recyclable materials are delivered by commercial and non-commercial haulers, and sorted and processed in one central location prior to delivery at end use distributors.

Contact Information

Primary Contact:
Paula Kelly
City of Irwindale
626 430 2200
5050 N. Irwindale Avenue
Irwindale, CA 91706

Project Location

County: Los Angeles
City: Irwindale, Baldwin Park
Region:
Cross Streets: NW corner of Live Oak Avenue and Arrow Highway
Latitude/Longitude: 34° 6' 15" / 117° 58' 0" Map
Parcel No: 8535-001-911
Township: 1S
Range: 10W
Section: 6
Base: SBB&M
Other Location Info:

Proximity To

Highways: I-605 and 210
Airports: No
Railways: SPRR
Waterways: San Gabriel River
Schools: Heath, Landis, Geddes
Land Use: Vacant and disturbed / Heavy Manufacturing / Commercial

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Development Type

Industrial, Other (MRF/TS, up to 6,000 Tons/day)

Local Action

General Plan Amendment, Site Plan, Rezone, Use Permit

Project Issues

Aesthetic/Visual, Air Quality, Archaeologic-Historic, Biological Resources, Drainage/Absorption, Flood Plain/Flooding, Geologic/Seismic, Minerals, Noise, Population/Housing Balance, Public Services, Recreation/Parks, Soil Erosion/Compaction/Grading, Solid Waste, Toxic/Hazardous, Traffic/Circulation, Water Quality, Water Supply, Grow th Inducing, Landuse, Cumulative Effects, Other Issues (Env. Justice)

Reviewing Agencies (Agencies in **Bold Type** submitted comment letters to the State Clearinghouse)

Resources Agency; Department of Parks and Recreation; Resources, Recycling and Recovery; Department of Water Resources; Department of Fish and Wildlife, Region 5; Native American Heritage Commission; Public Utilities Commission; California Highw ay Patrol; Caltrans, District 7; Air Resources Board, Major Industrial Projects; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 4; San Gabriel & Low er Los Angeles Rivers & Mountains Conservancy

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Date Received: 5/10/2013 **Start of Review:** 5/13/2013 **End of Review:** 6/11/2013

CEQAnet HOME | NEW SEARCH

NOTICE OF SCOPING MEETING

The City of Irwindale is the Lead Agency under the California Environmental Quality Act (CEQA) in the preparation of an Environmental Impact Report (EIR) for the *Materials Recovery Facility & Transfer Station* project ("MRF/TS" or "Proposed Project"). The Scoping Meeting is open to the public and will be held on **Tuesday, July 9th, 2013** from **4:00PM-5:00PM** at the Irwindale Recreation Center located at 5050 N. Irwindale Avenue, Irwindale, CA 91706.

The purpose of the Scoping Meeting is to solicit written input on the potential effects the Proposed Project may have on the environment. A brief presentation will be made that includes an explanation of the purpose of a scoping meeting, a description of the Proposed Project, and an overview of the EIR process as required by the CEQA. Following the presentation, questions will be taken and comment forms will be provided to solicit written input from the public on the effects the Proposed Project may have on the environment. Your comments on the potential environmental impact of the Proposed Project may be submitted in writing at the Scoping Meeting, emailed to paulakelly@ci.irwindale.ca.us, or faxed to (626) 962-2018 by Friday, July 12th, 2013. A copy of the Notice of Preparation [which includes the Project Description, regional map, and description of potential environmental effects] can be obtained by contacting Ms. Paula Kelly, Senior Planner at (626) 430-2209. State Clearinghouse #2013051029

NOTIFICACIÓN DE UNA REUNIÓN PÚBLICA INFORMATIVA

La Ciudad de Irwindale es la Agencia Principal bajo la Ley de Calidad Ambiental de California ("CEQA" por sus siglas en ingles) en la preparación de un Informe de Impactos Ambientales ("EIR" por sus siglas en ingles) para el Centro de Recuperación de Materiales y Estación de Transferencia ("MRF/TS" por sus siglas en ingles, o "Proyecto Propuesto"). Todos quedan invitados a la reunión publica, la cual se llevará a cabo el **martes, 9 de julio del 2013**, de **4:00 p.m. a 5:00 p.m.** en el Centro de Recreación de Irwindale, ubicado en 5050 N. Irwindale Avenue, Irwindale, CA 91706.

El propósito de esta reunión pública es para solicitar comentarios escritos sobre los efectos ambientales que pudieran ser causados por el Proyecto Propuesto. Se hará una presentación breve, la cual incluirá una explicación sobre el propósito de la reunión pública, una descripción del Proyecto Propuesto, y un resumen del proceso del EIR, tal como son requeridos por CEQA. Se podrán hacer preguntas y comentarios después de la presentación. Se proveerán formularios para que los comentarios se hagan por escrito para tratar el asunto de los efectos ambientales causados por el Proyecto Propuesto. Sus comentarios sobre los impactos ambientales potenciales del Proyecto Propuesto se pueden presentar por escrito durante la reunión publica, por correo electrónico a: paulakelly@ci.irwindale.ca.us, o por fax al 626-962-2018. Dichos comentarios deberán ser presentados a más tardar el viernes, 12 de julio del 2013. Se podrá conseguir una copia del Aviso de Preparación (el cual incluirá una descripción del proyecto, un mapa regional, y una descripción de los efectos ambientales potenciales) al comunicarse con Paula Kelly, Planificadora Principal, al 626-430-2209. State Clearinghouse #2013051029:

Scoping Meeting

City of Irwindale
Materials Recovery Facility
and Transfer Station Project

State Clearinghouse # 2013051029

Irwindale Recreation Center – Tuesday, July 9, 2013
4:00 – 5:00 pm

Purpose Of This Meeting

- Provide information on the *Irwindale Materials Recovery Facility and Transfer Station Project*
- Provide information about the CEQA process
- Discuss CEQA requirements for Scoping
- Solicit input from citizens and other agencies
- Based upon input, determine issues to be addressed and scope of analyses

City of IRWINDALE

Scoping Meeting Agenda

- Welcome and Introductions
- Project Description
- Purpose of the meeting and Scoping process
- California Environmental Quality Act (CEQA) Process Overview
- Public Comments – please complete Comment Card

City of IRWINDALE

Project Description

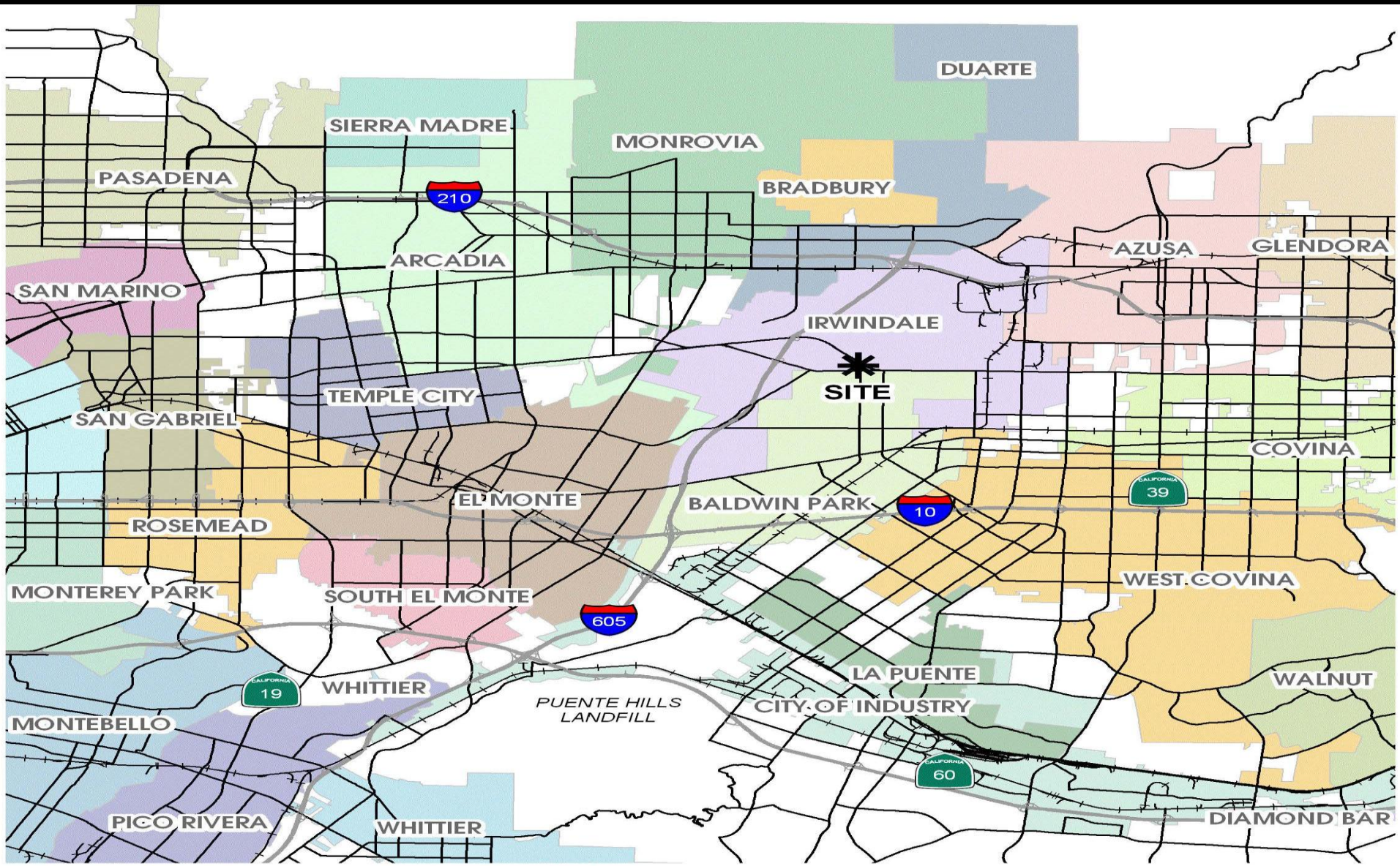
- Athens Services (Applicant) proposes to construct a Materials Recovery Facility and Transfer Station to be located at the northwestern intersection of Arrow Highway and Live Oak Avenue.

- Development of the site would include two components:

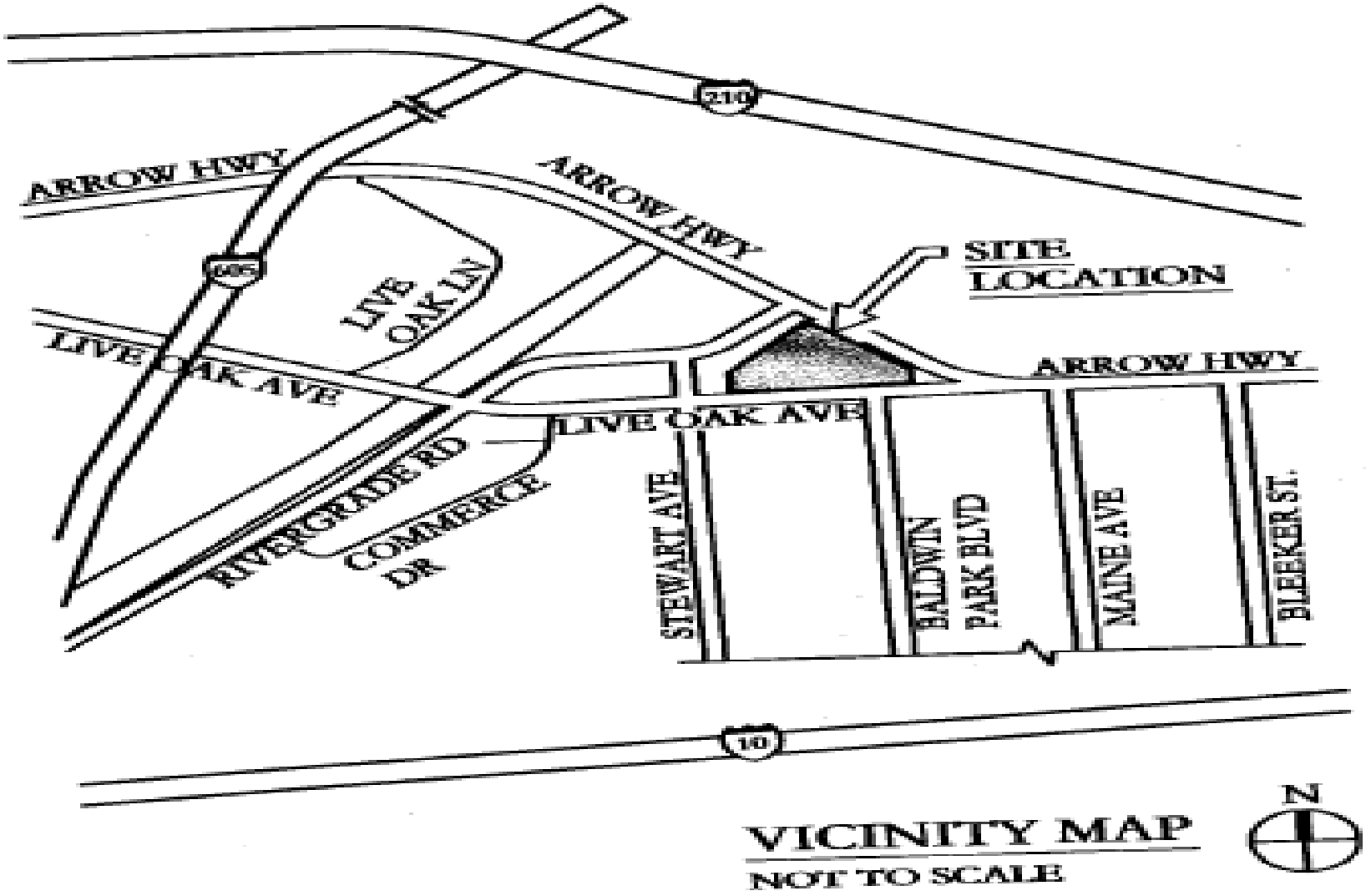
    1. Materials Recovery Facility and Transfer Station
    2. Fueling Facility and Convenience Store

City of IRWINDALE

Project Location Map



Project Vicinity Map

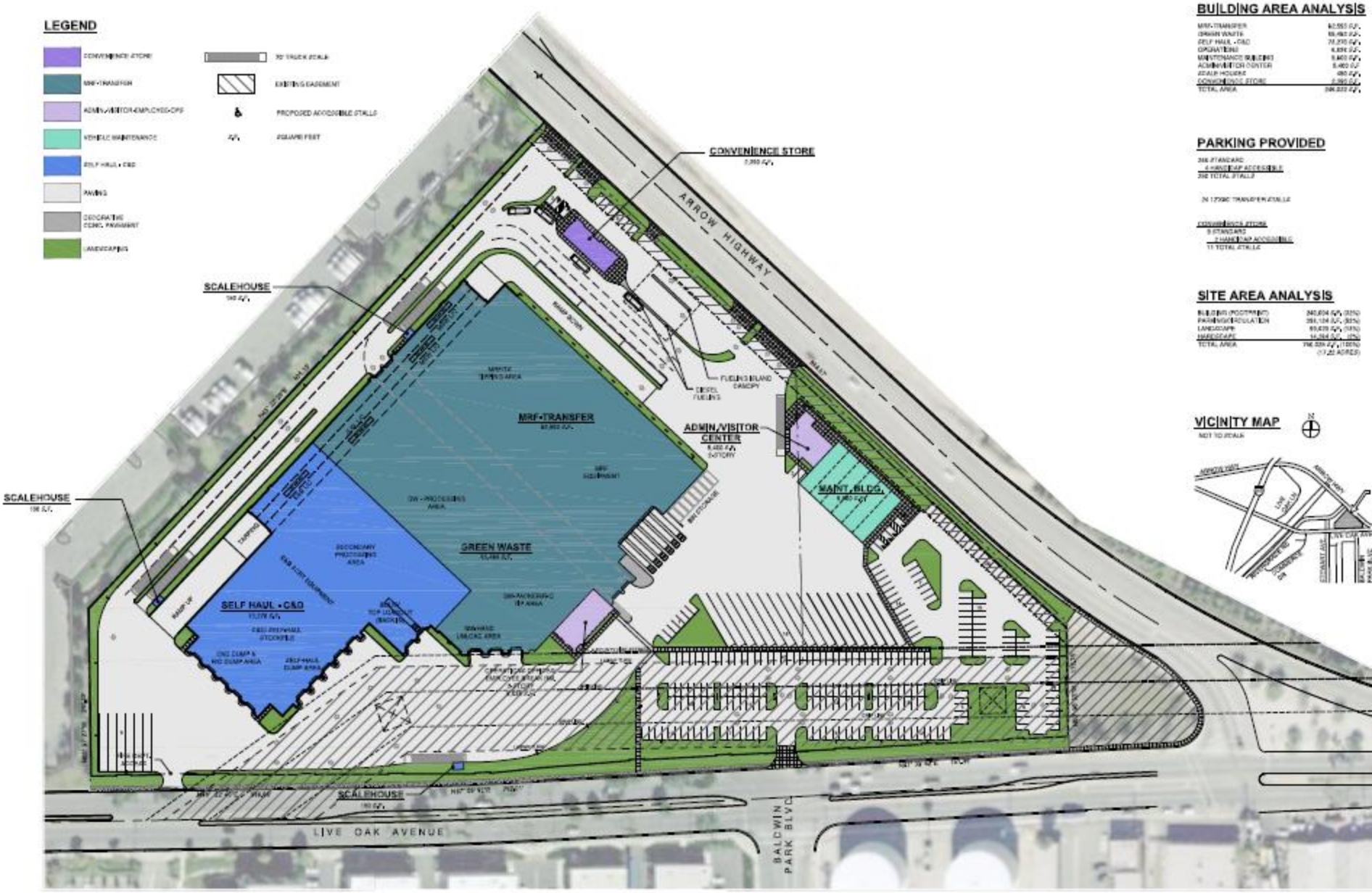


Project Description

Project – Site development as proposed within existing site

Project Variant – site development with portion of site occupied by a separate project (Valley County Water District water storage tanks)

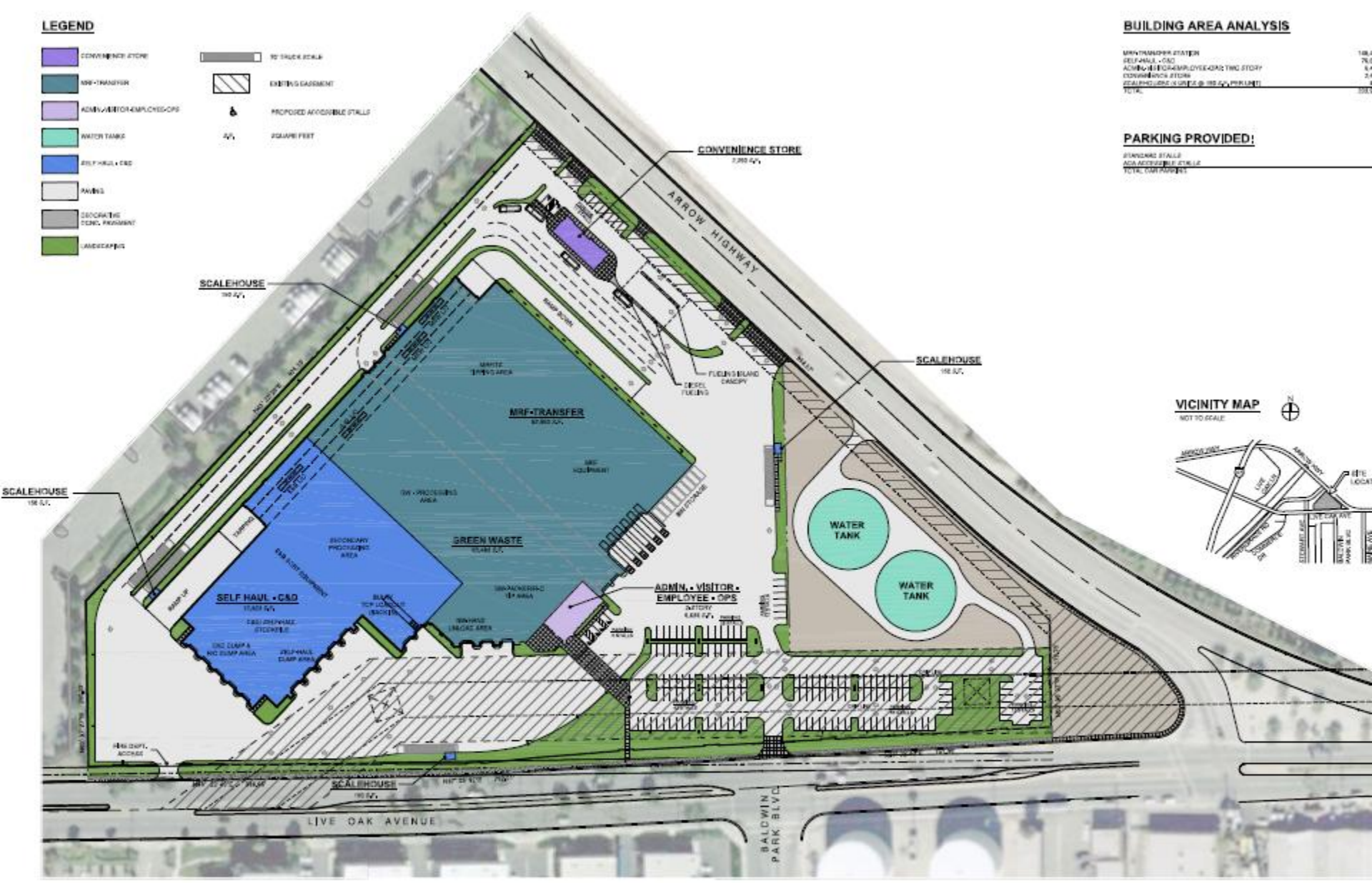
City of IRWINDALE



ATHENS-IRWINDALE
Material Recovery Facility and Transfer Station

CONCEPTUAL S

ARROW HIGHWAY
IRWINDALE, CA



ATHENS-IRWINDALE
Material Recovery Facility and Transfer Station

ARROW HIGHWAY
IRWINDALE, CA

CONCEPTUAL SITE

Project Description (cont.)

- The Materials Recovery Facility and Transfer Station would be constructed in a single phase – 14 months
- The site would receive residential and commercial waste, green yard waste and construction waste – capacity to process up to 6,000 tpd
- Employ approximately 323 persons

City of IRWINDALE

What is a MRF/TS?

Materials Recovery Facility & Transfer Station

California Department of Resources Recycling and Recovery (CalRecycle) defines a MRF as:

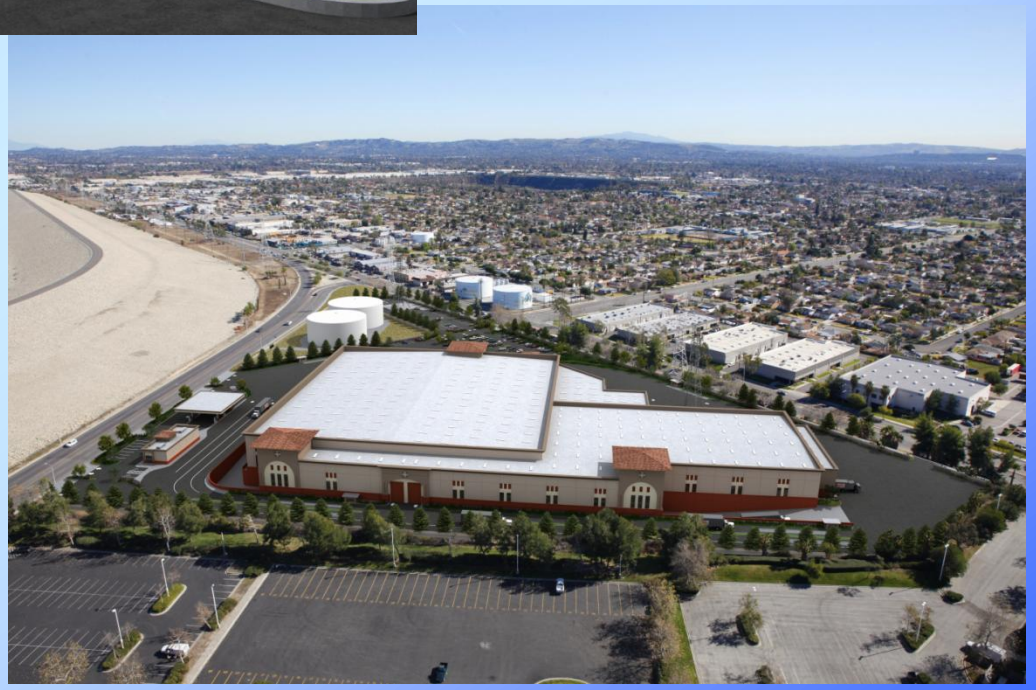
"a solid waste facility where solid wastes or recyclable materials are sorted or separated, by hand or by use of machinery, for the purposes of recycling or composting."

[14 CCR 18720(a)(36)].

City of IRWINDALE



Conceptual Renderings











Why do we need a MRF?

- To assist the region to achieve and surpass existing and foreseeable future waste reduction and diversion goals and mandates (AB 341 [2011])

Also known as the "Jobs and Recycling Bill"

AB 341 sets a 75% recycling goal for California by 2020

City of IRWINDALE

What is a MRF/TS ?

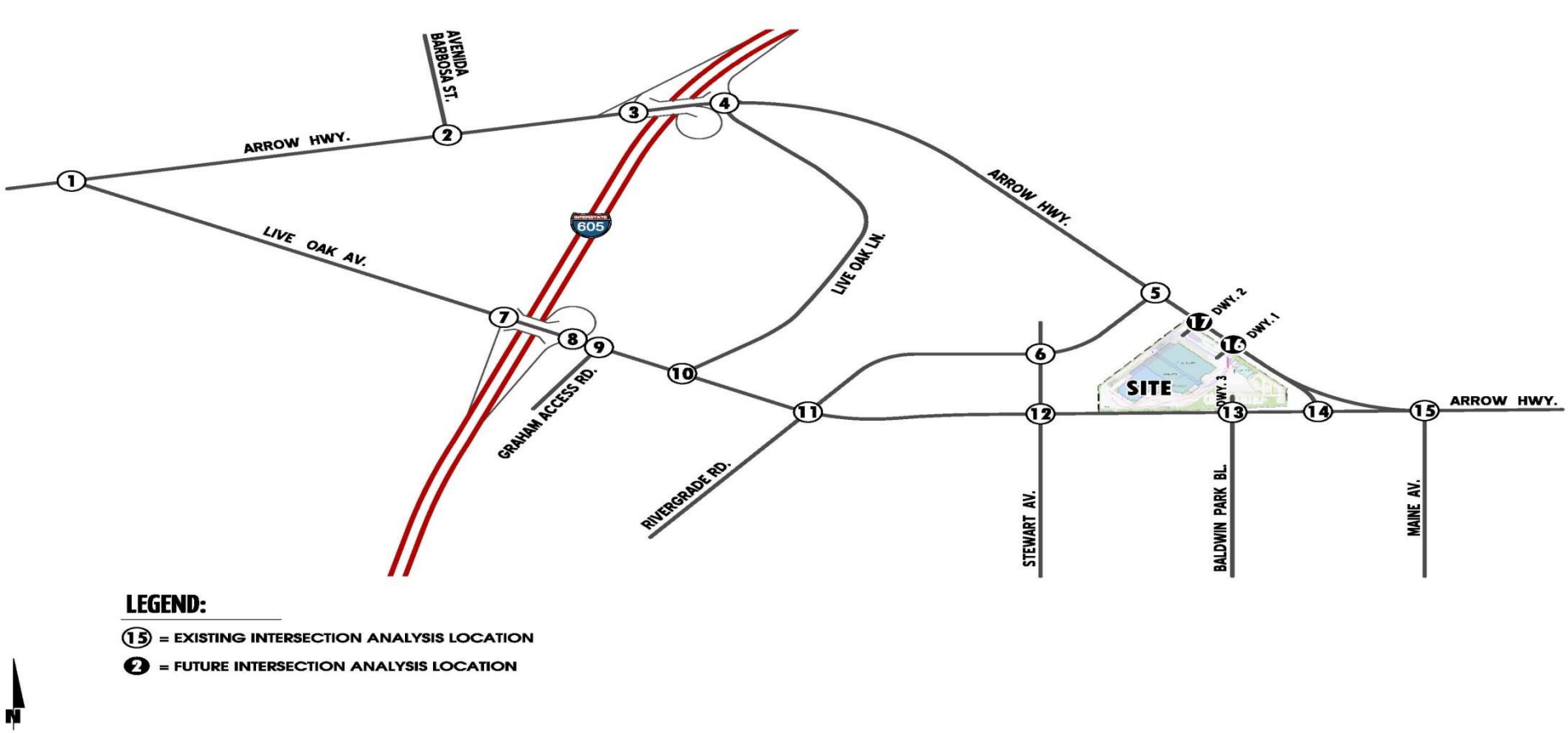
- A MRF/TS is a sorting facility that:
  1. receives your curbside trash and yard debris,
  2. processes it to recover reusable materials, and
  3. transfers those materials off-site for recycling or disposal elsewhere.

- *<u>It is not</u> a dump or a landfill, and it does not accept ANY toxic hazardous waste materials*

City of IRWINDALE

Why Irwindale?

The location selected is highly suitable for transportation access to regional freeways without using local residential streets.



Project Objectives

- Provide additional processing capacity to increase diversion of recyclable commodities
- Provide replacement capacity for Puente Hills Landfill that is scheduled to close 10/31/13
- Provide processing and diversion of construction and demolition debris presently deposited at the Puente Hills Landfill

City of IRWINDALE

Project Objectives (cont.)

- Reduce traffic and net air emissions on the regional transportation network by consolidating recyclable materials and wastes.
- Provide a disposal outlet accessible to waste haulers to reduce traffic loading to area roads during peak hours.
- Provide state-of-the-art recycling and waste processing.

City of IRWINDALE

Project Objectives (cont.)

- Facility location selected for efficient freeway access to minimize traffic on local roadways and communities.

- Provide a convenient and easily accessible recycling and disposal site for self-haul materials.

City of IRWINDALE

Overview of the Environmental Review Process and Requirements of the California Environmental Quality Act (CEQA)

What is CEQA?

- **The California Environmental Quality Act**
- **Comprehensive State-wide environmental law**
- **Requires consideration of environmental effects of proposed activities as a part of the decision-making process**
- **“Full disclosure” for public information**
- **Opportunities for agency and public review and comment**

City of IRWINDALE

What is the Purpose of an EIR?

- Requires Public Agencies to consider:
  - Potential environmental effects
  - Alternatives to the Project
- Inform the Public
- Guide Decisions (but not make them)

City of IRWINDALE

Steps in Typical CEQA Process

We are here



- Proposed Action
- Scoping
- Potential Impacts
- Analysis
- Alternatives
- Preferred Alternative
- Decision

City of IRWINDALE

Responsible & Interested Agencies

- City of Irwindale (Lead Agency)
- CalRecycle & Los Angeles County Sanitation District
- Los Angeles County Solid Waste Management Program
- Caltrans
- South Coast Air Quality Management District
- Los Angeles County Department of Health Services
- Adjacent cities of Baldwin Park, Duarte, Azusa, and Arcadia

Typical EIR Contents

- Executive Summary
- Project Description
- Discussion of the existing “baseline” conditions
- Analysis of environmental affects
- Presentation of project alternatives
- Mitigation Program
- Technical appendices

City of IRWINDALE

Issues identified to-date for inclusion in the EIR

- Aesthetics
- AQ/ Odors / Health Risk / GHG
- Biological Resources
- Cultural Resources
- Environmental Justice
- Geology & Soils
- Hazards & Hazardous Materials
- Land Use & Planning
- Noise
- Public Services & Utilities
- Traffic Generation & Circulation
- Water Quality & Hydrology
- Project Alternatives
- Cumulative Effects

City of IRWINDALE

Mitigation Program

- Required if impacts are identified as “significant” based on CEQA thresholds presented in the EIR
- Intended to reduce / avoid significant impacts
- May offset / compensate for impacts
- Must be clearly defined
- Must be feasible and within the ability of the jurisdiction to implement

City of IRWINDALE

Alternatives in a CEQA Document

- CEQA Requires a Reasonable Range of Alternatives
- Design to reduce / avoid identified Project impacts
  - No-Project alternative (Required)
  - Other possible alternatives (examples):
    - Alternative locations, capacity, and/or hours of operation
    - Alternatives considered but eliminated from further study
- Must account for basic goals and objectives of the Project

City of IRWINDALE

Opportunities for Public Review / Comment

- *Notice of Preparation* / 45-day public review period
  May 13, 2013 through June 26, 2013
- *Scoping Meeting* – July 9, 2013 (with comments by Friday July 12, 2013)
- *Draft EIR* / 45-day public review period (estimated Oct/Nov)
- *Final EIR* – (estimated Nov/Dec)
- *Project Decision*: Planning Commission / City Council (estimated Jan/Feb 2014)

City of IRWINDALE

Public Comment Opportunity

- ***If you have a question or comment, please fill out the comment form and turn it in at the sign-in table.***

- ***You may provide your comments in writing today or submit them to the City by 5:00 PM Friday July 12, 2013***

City of IRWINDALE

Contact

For additional information, please contact:

Ms. Paula Kelly, Senior Planner

City of Irwindale

phone: (626) 430-2209

email: paulakelly@ci.irwindale.ca.us

Thank you!

Notice of Preparation / Public Scoping Comment letters

Notice of Preparation / Public Scoping comment letters
Table of Contents

State Governor's Office of Planning and Research (May 13, 2013)
County of Los Angeles, Public Health (May 20, 2013)
Patricia Chamberlain (May 21, 2013)
Gabrieleno Band of Mission Indians/Kizh Tribe of the Los Angeles Basin, Orange County, and the Channel Islands (May 21, 2013)
Bella Hernandez (May 23, 2013)
City of Arcadia (June 6, 2013)
Bette Lou Lowes (no date)
Paul Lin (June 11, 2013)
California Department of Transportation (June 11, 2013)
County of Los Angeles, Department of Parks and Recreation (June 12, 2013)
Valley County Water District (June 11, 2013)
Remy, Moose, Manley LLP (June 13, 2013)
Jane and John Maguire (June 10, 2013)
Julie Pena (June 13, 2013)
D Squyres (June 15, 2013)
County Sanitation Districts of Los Angeles County (June 13, 2013)
City of West Covina (July 8, 2013)
Valley County Water District (July 12, 2013)
City of Azusa (June 12, 2013)
Jessie Almada (no date)
Ken Woods (no date)
Faith Cruz (July 10, 2013)
Jane and John Maguire (July 12, 2013)
Leon Ornellas (July 12, 2013))
Ernie Cardona (July 12, 2013)
Miguel Escoto (July 12, 2013)
Manuel Chavez (July 12, 2013)
Mario Cruz (July 12, 2013)
F. Javier Torres (July 12, 2013)
Jesus Ramirez (July 12, 2013)

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Edmund G. Brown Jr.
Governor

Ken Alex
Director

Notice of Preparation

May 13, 2013

To: Reviewing Agencies

Re: Athens Services Materials Recovery Facility and Transfer Station (MRF/TS)
SCH# 2013051029

Attached for your review and comment is the Notice of Preparation (NOP) for the Athens Services Materials Recovery Facility and Transfer Station (MRF/TS) draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Paula Kelly
City of Irwindale
5050 N. Irwindale Avenue
Irwindale, CA 91706

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2013051029
Project Title Athens Services Materials Recovery Facility and Transfer Station (MRF/TS)
Lead Agency Irwindale, City of

Type NOP Notice of Preparation

Description Athens Services (Applicant/Operator) has submitted an application to the City of Irwindale (City) to construct and operate a Materials Recovery Facility and Transfer Station (MRF/TS), with a Fueling Facility/Convenience Store (see NOP attached, figure 1 - 4). A MRF/TS is a facility where residential, commercial, and/or industrial municipal solid waste and recyclable materials are delivered by commercial and non-commercial haulers, and sorted and processed in one central location prior to delivery at end use distributors.

Lead Agency Contact

Name Paula Kelly
Agency City of Irwindale
Phone 626 430 2200 **Fax**
email
Address 5050 N. Irwindale Avenue
City Irwindale **State** CA **Zip** 91706

Project Location

County Los Angeles
City Irwindale, Baldwin Park
Region
Cross Streets NW corner of Live Oak Avenue and Arrow Highway
Lat / Long 34° 6' 15" N / 117° 58' 0" W
Parcel No. 8535-001-911
Township 1S **Range** 10W **Section** 6 **Base** SBB&M

Proximity to:

Highways I-605 and 210
Airports No
Railways SPRR
Waterways San Gabriel River
Schools Heath, Landis, Geddes
Land Use Vacant and disturbed / Heavy Manufacturing / Commercial

Project Issues

Reviewing Agencies

Date Received 05/10/2013 **Start of Review** 05/13/2013 **End of Review** 06/11/2013

NOP Distribution List

County: Los Angeles SCH# 2013051029

Resources Agency

- [ ] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  Nicole Wong
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [ ] **Dept. of Conservation**
  Elizabeth Carpenter
- [ ] **California Energy Commission**
  Eric Knight
- [ ] **Cal Fire**
  Dan Foster
- [ ] **Central Valley Flood Protection Board**
  James Herota
- [ ] **Office of Historic Preservation**
  Ron Parsons
- [ ] **Dept of Parks & Recreation**
  Environmental Stewardship Section
- [ ] **California Department of Resources, Recycling & Recovery**
  Sue O'Leary
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [ ] **Dept. of Water Resources Resources Agency**
  Nadell Gayou

Fish and Game

- [ ] **Dept. of Fish & Wildlife**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Wildlife Region 1**
  Donald Koch
- [ ] **Fish & Wildlife Region 1E**
  Laurie Harnsberger
- [ ] **Fish & Wildlife Region 2**
  Jeff Drongesen
- [ ] **Fish & Wildlife Region 3**
  Charles Armor
- [ ] **Fish & Wildlife Region 4**
  Julie Vance
- [ ] **Fish & Wildlife Region 5**
  Leslie Newton-Reed
  Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6 I/M**
  Brad Henderson
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Wildlife M**
  George Isaac
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Sandra Schubert
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Anna Garbeff
  Environmental Services Section
- [ ] **Dept. of Public Health**
  Jeffery Worth
  Dept. of Health/Drinking Water
- [ ] **Delta Stewardship Council**
  Kevan Samsam

Independent Commissions, Boards

- [ ] **Delta Protection Commission**
  Michael Machado
- [ ] **Cal EMA (Emergency Management Agency)**
  Dennis Castrillo
- [ ] **Native American Heritage Comm.**
  Debbie Treadway
- [ ] **Public Utilities Commission**
  Leo Wong
- [ ] **Santa Monica Bay Restoration**
  Guangyu Wang
- [ ] **State Lands Commission**
  Jennifer Deleong
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Philip Crimmins
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [ ] **California Highway Patrol**
  Suzann Ikeuchi
  Office of Special Projects
- [ ] **Housing & Community Development**
  CEQA Coordinator
  Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Rex Jackman
- [ ] **Caltrans, District 2**
  Marcelino Gonzalez
- [ ] **Caltrans, District 3**
  Gary Arnold
- [ ] **Caltrans, District 4**
  Erik Alm
- [ ] **Caltrans, District 5**
  David Murray
- [ ] **Caltrans, District 6**
  Michael Navarro
- [ ] **Caltrans, District 7**
  Dianna Watson
- [ ] **Caltrans, District 8**
  Dan Kopulsky
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Jacob Armstrong
- [ ] **Caltrans, District 12**
  Marlon Regisford

Cal EPA

Air Resources Board

- [ ] Airport/Energy Projects
  Jim Lerner
- [ ] Transportation Projects
  Douglas Ito
- [ ] Industrial Projects
  Mike Tollstrup
- [ ] **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Phil Crader
  Division of Water Rights
- [ ] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
- [ ] **RWQCB 5F**
  Central Valley Region (5)
  Fresno Branch Office
- [ ] **RWQCB 5R**
  Central Valley Region (5)
  Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
- [ ] **RWQCB 6V**
  Lahontan Region (6)
  Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] Other San Gabriel
  Esa Scholl

- [ ] _____
  Conservancy

Last Updated 01/08/2013

Print Form

Appendix C

~~Notice of Completion &~~ Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2013051029

Project Title: Athens Services Materials Recovery Facility and Transfer Station (MRF/TS)

Lead Agency: City of Irwindale — Contact Person: Paula Kelly
Mailing Address: 5050 N. Irwindale Avenue — Phone: (626) 430-2200
City: City of Irwindale — Zip: 91706 — County: Los Angeles

Project Location: County: Los Angeles — City/Nearest Community: Irwindale, Baldwin Park
Cross Streets: NW corner of Live Oak Avenue and Arrow Highway — Zip Code: 91706
Longitude/Latitude (degrees, minutes and seconds): 34 ° 6 ′ 15 ″ N / 117 ° 58 ′ 00 ″ W — Total Acres: 17.22 Acres
Assessor's Parcel No.: 8535-001-911 — Section: 6 — Twp.: 1S — Range: 10W — Base: SBD
Within 2 Miles: State Hwy #: I-605 and I-210 — Waterways: San Gabriel River
Airports: None — Railways: Southern Pacific — Schools: Heath, Landis, Geddes

Document Type:

CEQA: ☒ NOP ☐ Draft EIR — NEPA: ☐ NOI — Other: ☐ Joint Document
☐ Early Cons ☐ Supplement/Subsequent EIR ☐ EA ☐ Final Document
☐ Neg Dec (Prior SCH No.) ☐ Draft EIS ☐ Other:
☐ Mit Neg Dec Other: ☐ FONSI

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☒ Rezone ☐ Annexation
☒ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☒ Use Permit ☐ Coastal Permit
☐ Community Plan ☒ Site Plan ☐ Land Division (Subdivision, etc.) ☐ Other: ZOA/DDA/FFOA

RECEIVED
4:40 pm
MAY 10 2013
STATE CLEARING HOUSE

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☒ Industrial: Sq.ft. 246,022 Acres 17.22 Employees 85
☐ Educational:
☐ Recreational:
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type ____ MW
☐ Waste Treatment: Type ____ MGD
☐ Hazardous Waste: Type
☒ Other: MRF/TS, up to 6,000 Tons/day

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☐ Fiscal ☒ Recreation/Parks ☐ Vegetation
☐ Agricultural Land ☒ Flood Plain/Flooding ☐ Schools/Universities ☒ Water Quality
☒ Air Quality ☐ Forest Land/Fire Hazard ☐ Septic Systems ☒ Water Supply/Groundwater
☒ Archeological/Historical ☒ Geologic/Seismic ☐ Sewer Capacity ☐ Wetland/Riparian
☒ Biological Resources ☒ Minerals ☒ Soil Erosion/Compaction/Grading ☒ Growth Inducement
☐ Coastal Zone ☒ Noise ☒ Solid Waste ☒ Land Use
☒ Drainage/Absorption ☒ Population/Housing Balance ☒ Toxic/Hazardous ☒ Cumulative Effects
☐ Economic/Jobs ☒ Public Services/Facilities ☒ Traffic/Circulation ☒ Other: Env. Justice

Present Land Use/Zoning/General Plan Designation:

Vacant and disturbed / Heavy Manufacturing / Commercial

Project Description: *(please use a separate page if necessary)*

Athens Services (Applicant/Operator) has submitted an application to the City of Irwindale (City) to construct and operate a Materials Recovery Facility and Transfer Station (MRF/TS), with a Fueling Facility/Convenience Store (see NOP attached, figure 1 - 4). A MRF/TS is a facility where residential, commercial, and/or industrial municipal solid waste and recyclable materials are delivered by commercial and non-commercial haulers, and sorted and processed in one central location prior to delivery at end use distributors.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Revised 2010

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

X	Air Resources Board		Office of Historic Preservation
	Boating & Waterways, Department of		Office of Public School Construction
	California Emergency Management Agency		Parks & Recreation, Department of
	California Highway Patrol		Pesticide Regulation, Department of
X	Caltrans District # 7		Public Utilities Commission
	Caltrans Division of Aeronautics	X	Regional WQCB # 4
	Caltrans Planning		Resources Agency
	Central Valley Flood Protection Board		Resources Recycling and Recovery, Department of
	Coachella Valley Mtns. Conservancy		S.F. Bay Conservation & Development Comm.
	Coastal Commission	X	San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
	Colorado River Board		San Joaquin River Conservancy
X	Conservation, Department of		Santa Monica Mtns. Conservancy
	Corrections, Department of		State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of		SWRCB: Water Quality
	Energy Commission		SWRCB: Water Rights
X	Fish & Game Region # 5		Tahoe Regional Planning Agency
	Food & Agriculture, Department of		Toxic Substances Control, Department of
	Forestry and Fire Protection, Department of		Water Resources, Department of
	General Services, Department of		
	Health Services, Department of		Other:
	Housing & Community Development		Other:
X	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date May 13, 2013 Ending Date June 12, 2013

Lead Agency (Complete if applicable):

Consulting Firm:
Address:
City/State/Zip:
Contact:
Phone:

Applicant: Athens Services
Address: 5355 Vincent Avenue
City/State/Zip: Irwindale, CA 91706
Phone: (626) 336-3636

Signature of Lead Agency Representative: J. Harvey **Date:** May 10, 2013

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Paula Kelly

From: Gerardo Villalobos [gvillalobos@ph.lacounty.gov]
Sent: Monday, May 20, 2013 4:07 PM
To: Paula Kelly
Subject: Notice of Preparation Athens Irwindale MRF/TS
Attachments: 2013 5 20 Athens MRF and Trf Stn NOP Comments.pdf

Good afternoon Ms. Kelly

For your records I have attached LEA comments to the aforementioned subject project.

Should you have any questions, please do not hesitate to contact me.

Regards

Gerardo Villalobos, RHES, EHS IV
Solid Waste Management Program
5050 Commerce Drive
Baldwin Park, CA 91706
gvillalobos@ph.lacounty.gov
Office 626-430-5543
Fax 626-813-4839

COUNTY OF LOS ANGELES
Public Health

JONATHAN E. FIELDING, M.D., M.P.H.
Director and Health Officer

CYNTHIA A. HARDING, M.P.H.
Chief Deputy Director

ANGELO J. BELLOMO, REHS
Director of Environmental Health

TERRI S. WILLIAMS, REHS
Assistant Director of Environmental Health

JACQUELINE TAYLOR, MPA, REHS
Director, Bureau of Environmental Protection

Solid Waste Program
Cindy Chen, REHS
Chief Environmental Health Specialist
5050 Commerce Drive
Baldwin Park, California 91706
TEL (626) 430-5540 • FAX (626) 813-4239

www.publichealth.lacounty.gov

BOARD OF SUPERVISORS

Gloria Molina
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Mark Ridley-Thomas
Second District

Zev Yaroslavsky
Third District

Don Knabe
Fourth District

Michael D. Antonovich
Fifth District

May 20, 2013

Ms Paula Kelly, Senior Planner
City of Irwindale
5050 North Irwindale Avenue
Irwindale, CA 91706

Dear Ms. Kelly:

Re: State Clearinghouse No. 2008121079 - Notice of Preparation of a Draft Environmental Impact Report (DEIR) for the Construction and Operation of Athens Services Material Recovery Facility and Transfer Station in the City of Irwindale, Solid Waste Information System Number Not Assigned.

Thank you for allowing staff from the Los Angeles County Department of Public Health's Solid Waste Management Program, acting as Local Enforcement Agency (LEA) for the California Department of Resources Recycling and Recovery (CalRecycle), to review this Notice of Preparation (NOP). The following is a description of the proposed project as described in the NOP. If the Proposed Project Description below varies substantially from the project as understood by the Lead Agency, then LEA staff request that any significant differences be clarified and included in the DEIR.

Proposed Project Description

Athens Services proposes to construct and operate a Material Recovery Facility and Transfer Station (Facility) along with a Fueling Facility/ Convenience Store that is open to the public in the City of Irwindale. The proposed project is composed of a 17.22 acre site located on the northwestern intersection of Live Oak Avenue and Arrow highway in the City of Irwindale. The Facility would total approximately 243,000 square-feet and the Fueling Area/Convenience Store would total approximately 2,390 square-feet. Site Improvements would include truck scales, a scale house, ramps

to the load-out area tunnel, a loading dock, educational center, administrative, visitor's center, project driveways, vehicular parking stalls, and landscaping.

Project Variant

A project variant is also being proposed which involve the placement of two water storage tanks which, if approved, would occupy 1.9 acres of the 17.22 acre project site.

LEA Staff's Comments

The DEIR must detail all provisions in order to indicate the Facility's ability to meet State Minimum Standards for environmental protection (14 CCR Sec. 17000 et seq.)

- Permitted Area:
  - Describe in detail the permitted area.

- Peak Daily Tonnage

- Peak Vehicle Count

- Days of Operation:
  - Receipt of material/waste.
  - Transferring material/waste Out.
  - Processing of material/waste.
  - Maintenance of Facility, vehicles, etcetera.

- Hours of Operation:
  - Receipt of material/waste.
  - Transferring material/waste out.
  - Processing of material/waste.
  - Maintenance of Facility, vehicles, etcetera.

- Design Capacity:

- Acceptable Wastes:
  - Types of material/waste to be accepted.
  - Types of material/waste to be excluded.
  - Discussion load checking and screening procedures.
- Describe procedures for handling incoming incidental hazardous waste.
  - Describe procedures for handling universal and electronicwaste.

- Tonnage:
  - Describe and analyze the maximum design tonnage of the Facility.
- All incoming material/waste that enters the facility must pass over the scales and be analyzed for in the documents.

- Buildings and On-site Improvements:
- Describe in detail the design characteristics of significant improvements to be made to the site.

• Describe in detail where commercial municipal solid waste, green waste, construction and demolition materials will be handled.
• Describe in detail where the public self haulers solid waste, green waste, construction and demolition materials will be handled.
• Describe the design features of the Facility to attenuate for odors, dust, noise and vectors. Will the fully enclosed Facility be under negative pressure, have a filtration system, and have mister system to control odors and dust?
• Discuss the locations were salvaged/recyclable materials that are removed from the waste steam will be stored and for how long.
• Maps and Drawings:
• Provide accurate and to scale maps and drawings to identify the different areas operations of the facility.
• Odor Management Plan (OMP):
• All new facilities shall comply with the new requirements of Southern California Air Quality Management District.

• Permits:
• The proposed project will require the issuance of a Solid Waste Facility Permit (SWFP) by the Los Angeles County Department of Public Health Solid Waste Management Program, acting as the LEA for the CalRecycle and will require concurrence by the CIWMB as well as other federal, state and local permits/approvals.

• Potentially Significant Environmental Impacts:
• In the NOP, The Lead Agency has identified several resource topics that may be potentially significant. If there are significant impacts after design features or mitigation measures are implemented it will be necessary to prepare and adopt a Statement of Overriding Consideration. If it is necessary to prepare a Statement of Overriding Consideration please forward a copy to the LEA and CalRecycle prior to adoption for review. In order for CalRecycle to concur on a SWFP with significant impacts after mitigation, it is necessary for CalRecycle to adopt your Statement of Overriding Consideration as their own or prepare a separate Statement of Overriding Consideration.

• Cumulative Impacts:
• The DEIR should address the cumulative impacts resulting in the proposed project.

• Land Use Compatibility:
• The DEIR should identify the proposed land use surrounding the Facility and describe the distance to the nearest sensitive receptors (residential, commercial, etc.).

• Traffic and Related Transportation System Impacts:
• Peak volume and on site traffic circulation should be analyze to determine the impacts and mitigations necessary for the project.

• Air Quality:
• Air quality impacts should be analyzed in detail from all vehicles, truck and equipment emission sources from the operation of the facility.

• Noise:
• Noise quality impacts should be analyzed in detail on the proposed Facility operations. This should include all vehicle, truck and equipment sources to be utilized in the facility.

• Risk of Upset/Human Health Risk:
• An Emergency Response Preparedness Plan should be prepared and be made available. Personnel should be properly trained to handle emergency situations.

• Mitigation Reporting or Monitoring Program:
• The Mitigation Reporting or Monitoring Program should indicate that the agency designated to enforce the mitigation measures the Mitigation Reporting or Monitoring Program and have agreed that they have the authority and means to accomplish the designated responsibilities.

Conclusion

LEA Staff request copies of any subsequent or revised environmental documents in addition to the Draft Environmental Impact Report, etc. Please also include notice of this and any other environmental documents to CalRecycle's Waste Compliance and Mitigation Program, Permitting and LEA Support Division/ Environmental Review at 1001 I Street, Sacramento, CA 95814. Any subsequent or revised environmental documents should be circulated through the State Clearinghouse as required in 14 CCR Section 15205(a) of the CEQA Guidelines. The LEA requests notification of the date, time, and location of any public hearings regarding the proposed project at least ten days in advance.

Thank you for the opportunity to comment on this project in the early planning stages. Please feel free to contact Jose Reynoso myself at (626) 430-5540 with any questions you might have.

Sincerely,

Gerry Villalobos, EHS IV
Solid Waste Management Program, LEA
Los Angeles County Department of Public Health

CC: Martin Perez, CalRecycle

file

Paula Kelly

From: Cathy Huicochea
Sent: Monday, May 20, 2013 2:44 PM
To: Paula Kelly
Subject: NOTICE OF PREPARATION

Paula, someone named Stephanie came in to speak to you about the NOP. She reviewed it on the City website and has some questions. She can be reached at 626-617-9310.

Paula Kelly

From: Paula Kelly
Sent: Tuesday, May 21, 2013 1:28 PM
To: 'patti@dentalone.com'
Subject: RE: Proposed Materials Recovery Facility

Dear Ms. Chamberlain,

Thank you for your comments. The City is preparing an Environmental Impact Report that will look at potential impacts the proposed project will have on, among other things, neighboring land uses and the water table. I anticipate that this document will be released for public review in late summer/early fall. At that time, you will have the opportunity to review the document and submit comments. The proposed project will also be going through a public hearing process and you will have opportunities will voice your opinion (either in person or in writing) at these hearings.

From: patti@dentalone.com [mailto:patti@dentalone.com]
Sent: Tuesday, May 21, 2013 12:56 PM
To: Paula Kelly
Subject: Proposed Materials Recovery Facility

City of Irwindale
Attention: Paula Kelly

My immediate family have been living within a very short walking distance from the Santa Fe Dam and Live Oak Blvd.
for over 60 years.

Our main concern is how your project does not impact ;at all, your residents of Irwindale! The proposed project
only involves our community of Baldwin Park residents. There seems to be an indifference to your neighbors here in
Baldwin Park. What about your concerns for the impact your project may have regarding the Dam and watertable contamination.

We here in Baldwin Park want a definite promise from Irwindale ; that, you care for our well being as much as you care for your residence.
You as a community in my opinion have failed to show any concern except for this one page free mailing and your financial gains.

Please think about how dreadful this decision could possibly be if completed and then can not easily be reversed.

Sincerely,
Patricia Chamberlain
14103 E. Masline Street
Baldwin Park, Ca 91706

Paula Kelly

From: Paula Kelly
Sent: Wednesday, May 22, 2013 3:06 PM
To: 'gabrielenoindians@yahoo.com'
Subject: RE: Live Oak Avenue and Arrow Highway in the city of Irwindale,

Thank you. I just wanted to confirm that.

-----Original Message-----
From: gabrielenoindians@yahoo.com [mailto:gabrielenoindians@yahoo.com]
Sent: Wednesday, May 22, 2013 3:08 PM
To: Paula Kelly
Subject: Re: Live Oak Avenue and Arrow Highway in the city of Irwindale,

Please thank you
Sent from my BlackBerry® by Boost Mobile

-----Original Message-----
From: "Paula Kelly" <paulakelly@ci.irwindale.ca.us>
Date: Wed, 22 May 2013 15:01:35
To: <gabrielenoindians@yahoo.com>
Subject: RE: Live Oak Avenue and Arrow Highway in the city of Irwindale,

Okay, so your comment regarding a certified Native American monitor to be on the site during all ground disturbances still stands?

-----Original Message-----
From: gabrielenoindians@yahoo.com [mailto:gabrielenoindians@yahoo.com]
Sent: Wednesday, May 22, 2013 3:01 PM
To: Paula Kelly
Subject: Re: Live Oak Avenue and Arrow Highway in the city of Irwindale,

Actually I'm concerned with the ground disturbance of the area. Some of my family members also had a concrete industrial company next to United Concrete Pipe Corp.) from 1936 it was Called Sanchez & Sons.
Sent from my BlackBerry® by Boost Mobile

-----Original Message-----
From: "Paula Kelly" <paulakelly@ci.irwindale.ca.us>
Date: Wed, 22 May 2013 14:43:10
To: <gabrielenoindians@yahoo.com>
Subject: RE: Live Oak Avenue and Arrow Highway in the city of Irwindale,

Hi Chair Salas,

I just wanted to let you know that the property that is the subject of the EIR was not always vacant. The property was occupied by a large industrial facility (United Concrete Pipe Corp.) from 1936 to 1990. Does that make a difference in the comments that you submitted?

Paula Kelly
Senior Planner
City of Irwindale
Community Development Department

5050 Irwindale Avenue
Irwindale, CA 91706
626.430.2209

-----Original Message-----
From: gabrielenoindians@yahoo.com [mailto:gabrielenoindians@yahoo.com]
Sent: Wednesday, May 22, 2013 9:00 AM
To: Paula Kelly
Subject: Re: Live Oak Avenue and Arrow Highway in the city of Irwindale,

Thank you
Sent from my BlackBerry® by Boost Mobile

-----Original Message-----
From: "Paula Kelly" <paulakelly@ci.irwindale.ca.us>
Date: Wed, 22 May 2013 08:50:19
To: <gabrielenoindians@yahoo.com>; Christina Swindall Martinez. Kizh Gabrieleno<christinaswindall@yahoo.com>
Subject: RE: Live Oak Avenue and Arrow Highway in the city of Irwindale,

Dear Chair Salas,

Thank you for your response to the Notice of Preparation for the proposed MRF/TS project Environmental Impact Report (EIR) on property located at 2200 Arrow Highway. Your concerns will become part of the record and taken into consideration in the EIR. Feel free to contact me if you have any other questions or concerns.

Paula Kelly
Senior Planner
City of Irwindale
Community Development Department
5050 Irwindale Avenue
Irwindale, CA 91706
626.430.2209

-----Original Message-----
From: gabrielenoindians@yahoo.com [mailto:gabrielenoindians@yahoo.com]
Sent: Tuesday, May 21, 2013 10:16 PM
To: Paula Kelly; Christina Swindall Martinez. Kizh Gabrieleno
Subject: Live Oak Avenue and Arrow Highway in the city of Irwindale,

Dear Paula
This email is in response to your letter regarding the subject project on the corner of Live Oak Avenue and Arrow Highway in the city of Irwindale, known As a Prehistoric Kizh Gabrieleno village of our people . The proposed project is within a highly culturally sensitive area and in order to protect our resources we're requesting one of our experienced & certified Native American monitors to be on site during all ground disturbances.
This is the tribe's right under the FCC's National Programmatic AgreemenIn all cases, when the NAHC states there are "no records of sacred sites" in the subject area; they always refer the contractors back to the Native American Tribes whose tribal territory the project area is in. This is due to the fact, that the NAHC is only aware of general information on each California NA Tribe they are NOT the "experts" on our Tribe. Our Elder Committee & Tribal

Historians are the experts and is the reason why the NAHC will always refer contractors to the local tribes.
Please contact our office regarding this project to coordinate a NA monitor to be present.
Thank You

Sincerely,
Andy Salas
Chairman Of Gabrieleno Band Of Mission Indians/Kizh Tribe Of the Los Angeles Basin, Orange county and the Channel islands.

www.gabrielenoindians.org

Sent from my BlackBerry® by Boost Mobile

May 23, 2013

Ms. Paula Kelly, Senior Planner
5050 North Irwindale Avenue
Irwindale CA. 91706

Dear Ms. Kelly:

NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT IRWINDALE MATERIALS RECOVERY FACILITY AND TRANSFER STATION

Thank you for the opportunity to review the Notice of Preparation of a Draft Environmental Impact Report (NOP/DEIR) for the proposed Irwindale Materials Recovery Facility and Transfer Station (MRF/TS). The project proposes to construct and operate a regional facility where residential, commercial, and/or industrial municipal solid waste and recyclable materials are delivered by commercial and non-commercial haulers, and sorted and processed prior to delivery at end use distributors.

The following comments are on behalf of residents of the City of Baldwin Park living south of Live Oak Avenue within a few hundred feet from the proposed facility:

1. Residents oppose the location of the proposed project for the following reasons:

    a. Current air quality surrounding our homes is already well beyond acceptable levels due to proximity of the I-605 Freeway to the west, several recyclable facilities on Live Oak, and the Waste Management Corporation yard on Steward Avenue.

    b. The proposed facility will increase cancer risk impacts due to increased contaminants found in waste.

    c. The proposed facility will bring more rodents due to increased odors found in waste.

    d. The proposed facility will bring more truck traffic to our community leading to increased air pollution and noise.

    e. The proposed facility will reduce the value of our properties due to its adverse impacts to air quality, noise, traffic and pollution.

Residents will oppose any project that worsens air quality and puts at risk public health.

If you have any questions regarding these comments, please contact Bella Hernandez at (626) 715-6383 or bllhernandez13@gmail.com.

Paula Kelly

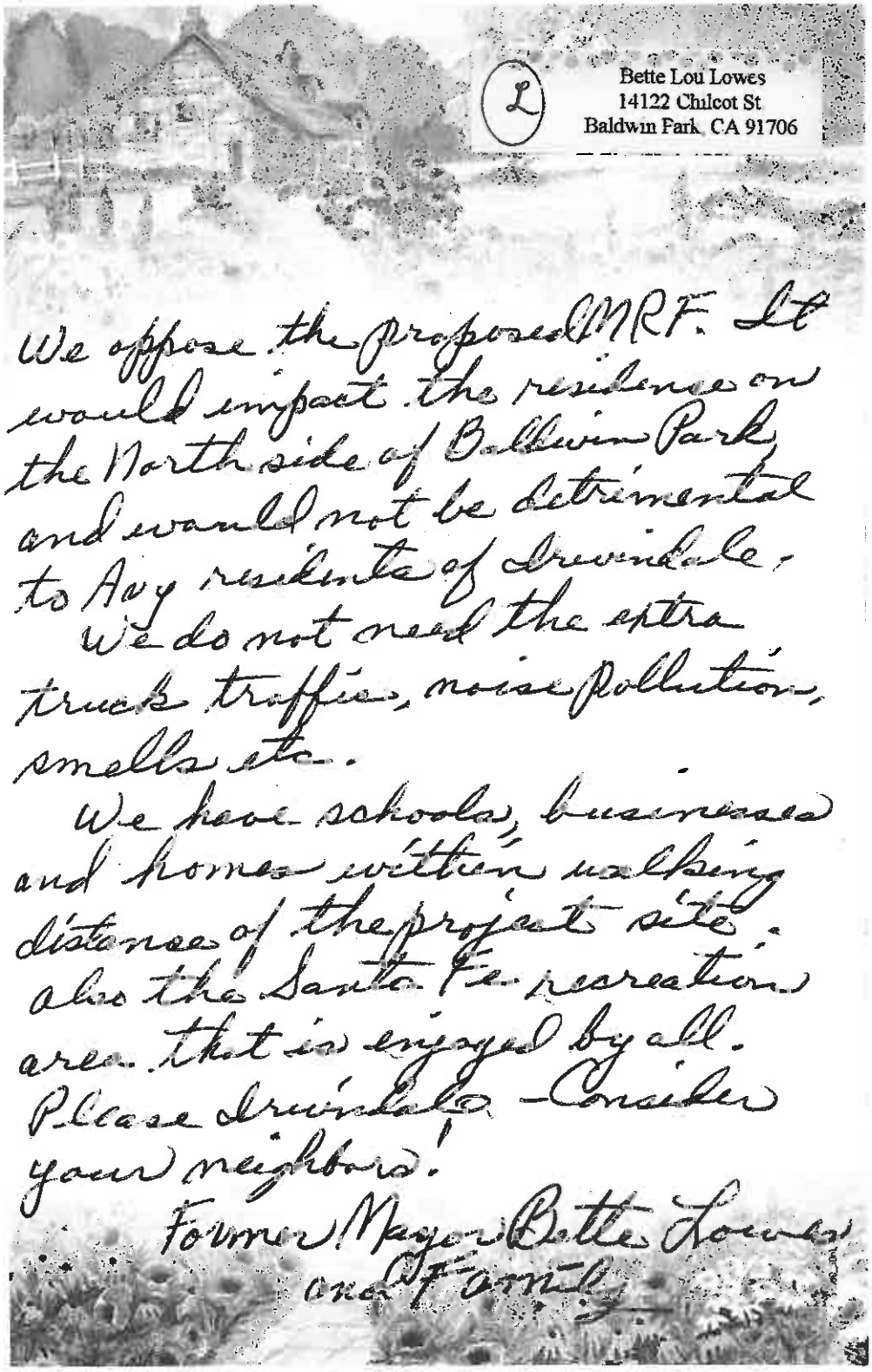
From: Lisa Flores [lflores@ci.arcadia.ca.us]
Sent: Thursday, June 06, 2013 10:39 AM
To: Paula Kelly
Subject: Irwindale MRF

Hi Paula,

How have you been? I was wondering if we can a copy of the traffic study for this project, and EIR? Thanks.

Lisa

Lisa L. Flores
Senior Planner
City of Arcadia
P: 626-574-5445
F: 626-447-9173
lflores@ci.arcadia.ca.us



Bette Lou Lowes
14122 Chilcot St
Baldwin Park, CA 91706

2

We oppose the proposed MRF. It would impact the residence on the North side of Baldwin Park and would not be detrimental to Any residents of Irwindale.

We do not need the extra truck traffic, noise pollution, smells etc.

We have schools, businesses and homes within walking distances of the project site. Also the Santa Fe recreation area that is enjoyed by all.

Please Irwindale Consider your neighbors!

Former Mayor Bette Lowes and Family

Jun.11, 2013

Paul Lin
5122 N. Wimmer Ave.,
Baldwin Park, CA 91706

City of Irwindale
5050 N. Irwindale Ave.,
Irwindale, CA 91706

Re: Disagree to the proposed Materials Recovery Facility and Transfer Station Project near by City of Baldwin Park

To City of Irwindale:

After studied and researched regarding the influence of the Materials Recovery Facility and Transfer Station Project. I discovered several points can not be and impossible succeeded by the Facility and the City of Irwindale. The following points should be considered by the City and the residents and can never be resolved by any kind of protective improvement.

1. **Air Pollution, Smell condition**---will severe destroy people' health. MRF never control air & smell issue for the other facilities. So no credit to let us believe they can do well. A facility of Athens Waste Services at Valley Blvd. City of La Puente area is a very bad example. Bad smell is all around the area. Especially when raining day and hot day.
2. **Environment**---vision violent along with air and smell problem.
3. **Traffic**---605 & Arrow Hwy already very busy how to afford the big quantity traffic come in the same area every day?
4. **Image**---nobody will feel comfortable if this kind facility is your neighbor. And you?
5. **Quality of Community**---total community quality will be affected strongly.
6. **Property Value**---will drop deeply and this kind loss the City of Irwindale & the Facility Company will hold the big responsibility.

Lots of points must be concerned especially the residents health & safety, future & benefit. The City of Irwindale and the Facility Company can not be so selfish just for the reason of saving money and making profit for your own and sacrifice the people live in the City of Irwindale & Baldwin Park .

To avoid a lot of arguments and law suits in the future my **suggestion** to the City of Irwindale and the Facility Company is:

(1) Build the facility in the area where nobody lives around (Non-Residential area).
(2) Always care about Human's & People's Right. Just very simple think about if you are the residence of the neighborhood what do you feel.

I strongly believe after you do this adjustment you will really success in the future. Nobody will against you. Your kind attention will be highly appreciated.

Sincerely yours

Paul Lin 6-11-13

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, OFFICE OF TRANSPORTATION PLANNING
IGR/CEQA BRANCH
100 MAIN STREET, MS # 16
LOS ANGELES, CA 90012-3606
PHONE: (213) 897-9140
FAX: (213) 897-1337

Flex your power!
Be energy efficient!

June 11, 2013

Ms. Paula Kelley
City of Irwindale
5050 North Irwindale Ave
Irwindale, CA 91706

Re: **Materials Recovery Facility and Transfer Station**
Notice of Preparation of Draft EIR
IGR#130536/EA, Vic: LA/605/23.9

Dear Ms. Kelley:

The California Department of Transportation (Caltrans) has reviewed the Notice of Preparation (NOP) of Draft Environmental Impact Report (DEIR) for the proposed Materials Recovery Facility and Transfer Station. The project site is located on the northwest corner of Live Oak Avenue and Arrow Highway.

Based on the information received, operations of the proposed facility would generate heavy-duty truck traffic. Caltrans requests that the proposed project evaluate potential transportation impacts to I-605 and I-210 as well and nearby on-and-off-ramps. Any vehicle queues at freeway off-ramps that are projected to extend to mainline freeway lanes need to be avoided.

Please require that a traffic impact study is prepared and that it include the following elements:

- Inclusion of all appropriate traffic volumes. Analysis should include a) traffic from the project under consideration, b) cumulative traffic from all specific approved developments in the area, c) cumulative traffic from all foreseeable developments in the area, and d) traffic growth other than from the project and developments. That is, include existing+ project+ other related projects+ other growth. Different scenarios involving different assumptions on development and growth might be considered.

- Analysis of AM, and PM peak-hour volumes for both existing and future conditions in the affected area at I-605 at Live Oak Ave and Arrow Highway and I-210 at Irwindale Avenue. Level of Service calculations according to HCM2000 methodology is requested. Future conditions would include build-out of proposed project and all foreseeable related projects.

- Presentations of assumptions and methods used to develop trip generation, trip distribution, trip assignments. Truck trips generation is to be converted to passenger-car equivalents (PCEs)

- Travel modeling should be consistent with other regional and local modeling forecasts and with travel data.

- Discussion of mitigation measures appropriate to alleviate anticipated traffic impacts. This discussion should include, but not be limited to, the following:
  - description of transportation infrastructure improvements
  - financial costs, funding sources and financing
  - sequence and scheduling considerations
  - implementation responsibilities, controls and monitoring

- For additional information, please refer to State Guide for the Preparation of Traffic Impacts Studies at: http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

In addition, Caltrans requests that the following items generally associated with heavy duty truck traffic are considered:

1) Truck vehicle access to/from highways may be slower than other vehicle due to the additional weight.
2) Turning radii may need to be larger to prevent trucks from crossing the centerline.
3) Shoulder widths may need to be increased.
4) Sight distance may influence the need for curve corrections.
5) Cargo spills need to be cleaned up expeditiously to prevent accidents.
6) Truck routes need to avoid areas with frequent pedestrian use, such as schools.

Since I-210 is generally congested during the AM and PM peak commuting periods, Caltrans requests that projected truck trips directed to it are limited to off-peak commute periods as much as possible. The applicant should avoid platooning of trucks on mainline freeway lanes as well as at on/off-ramps.

If you have any questions regarding these comments or wish to schedule a meeting, you may contact myself or project coordinator Elmer Alvarez at (213) 897 – 6696 or electronically at elmer.alvarez@dot.ca.gov. Please refer to our internal record number 130536/EA.

Sincerely,

DIANNA WATSON
IGR/CEQA Branch Chief

COUNTY OF LOS ANGELES
DEPARTMENT OF PARKS AND RECREATION
"Parks Make Life Better!"
Russ Guiney, Director John Wicker, Chief Deputy Director

June 12, 2013 Sent via e-mail: paulakelly@ci.irwindale.ca.us

Ms. Paula Kelly, Senior Planner
City of Irwindale
5050 North Irwindale Avenue
Irwindale, CA 91706

Dear Ms. Kelly,

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT (EIR) FOR THE CONSTRUCTION AND OPERATION OF A MATERIALS RECOVERY FACILITY AND TRANSFER STATION

The Notice of Preparation of the Draft EIR for the subject project has been reviewed for potential impacts on the facilities of this Department. As stated in the previous comment letter for the proposed project, construction will have an adverse impact on Santa Fe Dam Recreation Area (SFD) located at 15501 E. Arrow Highway, Irwindale, CA 91706. The Draft EIR should address the following issues:

AESTHETICS
The proposed project site is on a vacant lot in close proximity to Santa Fe Dam Recreation Area. The proposed project on this lot will have an adverse effect on the view from the bike/pedestrian path (trail) on top of the dam. Mitigation for aesthetic impacts should include screening of the project site so that it is not visible at all from the trail.

AIR QUALITY
The proposed project will contribute to existing air quality problems in a region where the levels of ozone, carbon monoxide and particulate matter exceed federal limits established to protect public health. The proposed activities associated with project construction and increased traffic generated by the project will result in fugitive dust, mobile emissions, and various stationary source emissions. Certain park patrons are especially vulnerable to the effects of air pollutants, including the elderly, children, persons with pre-existing respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise.

NOISE
The construction of the proposed project will generate increased noise levels adversely affecting sensitive receptors such as the elderly and children who use the trail on top of the dam. Although construction noise is a temporary impact, mitigation measures should be implemented to reduce this significant impact. To that end, construction should be limited to weekdays and not allowed on weekends when the trail and the entire Recreation Area are most heavily used.

RECREATION
Development of the proposed project will negatively impact the operation of the trail on top of the dam at Santa Fe Dam Recreation Area. In particular, the potential aesthetics, air quality, and noise impacts described above could discourage patrons from visiting the Recreation Area and compel them to travel further to other recreational facilities.

Thank you for the opportunity to participate in this environmental review process. If we may be of further assistance, please contact me at (213) 351-5129 or jchien@parks.lacounty.gov .

Sincerely,

Jui Ing Chien
Park Planner

JIC:jic:ner Response to City of Irwindale Athens Facility.doc

c: Parks & Recreation (N. E. Garcia, K. King, J. Rupert, H. Sohm, R. Williams, C. Graham, J. Norcia)

Valley County Water District
14521 Ramona Boulevard
Baldwin Park, CA 91706

(626) 338-7301
(626) 814-2973 Fax

June 11, 2013

Ms. Paula Kelly, Senior Planner
City of Irwindale
5050 N Irwindale Avenue
Irwindale, Ca 91706

Re: Notice of Preparation of Environmental Impact Report for the Proposed Athens Materials Recovery Facility and Transfer Station

Ms. Kelly,

Valley County Water District has received the City of Irwindale Notice of Preparation for an Environmental Impact Report related to the proposed Athens Materials Recovery Facility and Transfer Station. Although the notice of preparation makes reference to the interests of Valley County Water District with regard to acquiring the parcel of land for construction of two water storage tanks, Valley County Water District further reiterates its intentions of negotiating a sale agreement with the City of Irwindale for the identified 1.9 acres at the site.

Throughout its master planning efforts, which date back to 1999, Valley County Water District has identified the need for additional water storage facilities to address a 6.0 million gallon emergency storage deficiency. Over the past year, Valley County Water District has made significant achievements in the preliminary planning phases of its proposed water storage tank project, including:

- Completion of a 20-year long range financial plan
- Implementation of a 5-year rate and fee plan to support potential financing mechanisms
- Completion of the project preliminary design report
- Retention of a financial consulting firm for project funding

A project coordination meeting was held between Valley County Water District, Civiltec Engineering, and Fieldman, Rolapp & Associates for the development of a tentative project schedule, which includes lead times for financing acquisition, final project design, land acquisition, construction bidding, and award of a

construction contract. Based on the tentative schedule, Valley County Water District intends on acquiring the required funding for the project within the 2013 calendar year.

If you have any questions pertaining to the information provided, please contact me at your convenience at (626) 338-7301 ext. 201 or lnoriega@vcwd.org.

Sincerely,

Lynda Noriega
General Manager
VALLEY COUNTY WATER DISTRICT

RMM

REMY | MOOSE | MANLEY LLP

Andrea K. Leisy
aleisy@rmmenvirolaw.com

June 13, 2013

VIA REGULAR & ELECTRONIC MAIL
paulakelly@ci.irwindale.ca.us

Ms. Paula Kelly, Senior Planner
City of Irwindale
5050 North Irwindale Avenue
Irwindale, California 91706

Re: Notice of Preparation of a Draft Environmental Impact Report for the Irwindale Materials Recovery Facility and Transfer Station, 2200 Arrow Highway, Irwindale, California

Dear Ms. Kelly:

On behalf of our client, Azusa Land Reclamation, Inc. and USA Waste of California, Inc. (collectively, "Waste Management"), we offer the following comments regarding the Notice of Preparation ("NOP") of a Draft Environmental Impact Report for the Irwindale Materials Recovery Facility and Transfer Station project ("Project" or "MRF/TS"). The Project proposes to construct and operate a MRF/TS with a Fueling Facility/Convenience Store in the City of Irwindale ("City"). Although the proposed Project would have a maximum capacity to process up to 3,000 tons per day ("tpd"), the maximum permitted capacity would be 6,000 tpd.

I. Projects of Statewide, Regional, or Areawide Significance – Duty to Consult

The NOP states that the proposed MRF/TS "is a regional facility" that will serve the City and surrounding communities. (NOP, p. 2.) The Project also requires a general plan amendment, zone change, and zoning ordinance amendment. Thus, the proposed MRF/TS is considered a project of "statewide, regional, or areawide significance[,]" triggering certain requirements under the California Environmental Quality Act ("CEQA") (Pub. Resources Code, § 21000 et seq.). (CEQA Guidelines, § 15082, subd. (b)(2) [definition and examples of projects of "statewide, regional or areawide significance"].)

For projects of "statewide, regional, or areawide significance, the lead agency shall consult with transportation planning agencies and public agencies that have transportation facilities within their jurisdictions which *could be* affected by the project." (Pub. Resources Code, § 21092.4, subd. (a), emphasis added.) Such "transportation facilities" include "major local arterials and public transit within five miles of the project

site and freeways, highways, overpasses, on-ramps, off-ramps, and rail transit service within 10 miles of the project site." (Pub. Resources Code, § 21092.4, subd. (b).)

Additionally, the lead agency must call at least one scoping meeting, with notice of that meeting provided to all of the following: "[a] county or city that borders on a county or city within which the project is located, unless otherwise designated annually by agreement between the lead agency and the county or city"; [a] responsible agency; "[a] public agency with jurisdiction by law with respect to the project"; and "[a] public agency, organization, or individual who has filed a written request for the notice." (Pub. Resources Code, § 21083.9, subds. (a)-(b); CEQA Guidelines, § 15082, subd. (c)(1).) Because the Project could result in impacts to both Caltrans and Azusa roadways, the City has a duty to consult with Azusa and Caltrans as it would with other responsible agencies regarding traffic impacts. The City must also hold a public scoping meeting. Please include us on the City's public notification list for this Project.

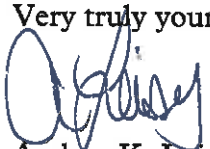
II. Traffic and Circulation

As the City is aware, our clients remain concerned that the EIR for the Project identify and mitigate all of the significant adverse impacts (direct and cumulative) that will be caused by the Project, particularly with respect to traffic impacts. The NOP states that primary truck access to and from the site would be from Arrow Highway, and directed to/from Interstate 605 for regional transport exclusively using City roadways. Access to the Fueling Facility/Convenience Store would also be located on Arrow Highway. Employees, visitors, and the Fire Department would access the site on Live Oak Avenue. (NOP, p. 5.)

The traffic analysis should explain the basis for the above route assumptions in the EIR, and how the City would enforce the use of the assumed haul routes to be used by the collection and transfer trucks. This is of particular concern under the Project Variant scenario that, if approved, would include the use of sub-contracted haulers over which the City would presumable have little control. Waste Management recommends that the City consult with Azusa's engineering staff to include mitigation measures for significant adverse impacts to Azusa's roadway network.

Please add my name, address, and e-mail to the City's mailing and distribution list for any public notices issued by the City's Planning and Community Development Department, or any other City office or department, in connection with the Project; including notices issued under CEQA, the Brown Act and the Planning and Zoning Law.

Very truly yours,



Andrea K. Leisy

Irwindale Planning Dept

Irwindale , CA

RE: MRF

June 10, 2013

Dear Sirs:

We are categorically opposed to the MRF on all levels! We have lived in the same home for more than 45 years. The San Gabriel Valley has some of the worst air quality in the county, if not all of Southern California. The dirt & dust from the mining, traffic etc. insure that our cars, patio & even inside our home we always have a layer of dust & grit. We breathe this air continuously. And you plan to add to it!!! There are no guarantees....I don't care HOW state of the art this facility will be. It is not your health or the health of Irwindale residents.

The traffic on our street (Baldwin Park Blvd) & up on Arrow Highway is bad enough & you intend to make sure we have much more! This is all about money. Your city needs it & this is one way to get it. Money always trumps everything. Quality of life etc.! But it's not YOUR LIFE!!!

Well, look into your heart or soul & be honest! Would you want to live within 500 feet of a MRF? This facility is far, far away from ANY Irwindale residents, but right across the street from our home. If it were to be built next to Glendora or La Verne or ?? it would not be happening.

This is not environmental justice. The people you will be impacting are not wealthy. We are just hard working people making ends meet & most , if not all, do not have the means to move away from this tragic situation you are trying to foist on us.

Noise, air quality, traffic, dirt, dust lights etc. these are the things WE will deal with while **Irwindale** reaps the benefits!!

There are many other sites to be considered but you turned them all down for one reason or another. We all know a case can be made for or against anything if enough effort is made. The pit on the NW corner of the 210 freeway & Irwindale Ave is filling up quite nicely as we have noticed. No homes around & close to the freeway.

This has been, & is ongoing, a very stressful situation for the Baldwin Park residents you are going to be impacting!! We appeal to your sense of decency & concern for your fellow man & urge you to find another place for your MRF. We all live in this world. Show some consideration & concern for the people who will be impacted **24/7 by this facility.** It is not your life.....IT IS OURS!!!!!!!

Yours truly,

Jane & John Maguire

5112 Baldwin Park Blvd. –Baldwin Park, CA 91706

Paula Kelly

From: JULIE PENA [notosch190e@yahoo.com]
Sent: Thursday, June 13, 2013 7:30 PM
To: Paula Kelly
Subject: Materials Recovery Facility and Tansfer Station

Name: Julie Pena Torres
Residence: 14113 Cragmont St., Baldwin Park, CA 91706
Status: Opposition to MRFTS

I oppose the MRFTS construction for the following reasons:

1-traffic pollution
2-noise pollution
3-environment pollution

I strongly object to the construction of the MRFTS site Live Oak Avenue and Arrow Highway. I live a block away for the propose site. There is horrible traffic congestion now without the site. Once the site is included, big rigs will be added to the current traffic congestion. I have seen drivers, small cars and big rigs from other companies, at this site, run red lights and even blocking the Baldwin Park intersection and the Maine intersection. If, MRFTS is constructed here, the incidents will increase significantly.

Noise and unsafe pollutants will be increase. I do not want to smell oders, inhale toxic fumes.

Furthermore, Irwindale may "compensate" Baldwin Park but I am a resident that will live with feet of the site and who will compensate me when I fall ill from MRFTS's toxins!!

I vigorously oppose the construction of MRFTS at Live Oak Avenue and Arrow Highway!

Julie Pena Torres

Paula Kelly

From: D Squyres [ddsquyres@rocketmail.com]
Sent: Saturday, June 15, 2013 1:20 PM
To: Paula Kelly
Subject: recycle plant-live oak/arrow

against location-look at or walk through Allen paper/recycle down the street-the smell is horrible as are the flies. looks bad and always messy. concerned about location -across the street from water supply, BP city and Santa Fe Dam recreation area, bike lanes, water shed land. Can't another location out of town be found? support recycle projects but not in my backyard, ------sorry.
squyres family, BP

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

GRACE ROBINSON CHAN
Chief Engineer and General Manager

June 13, 2013

Ref. File No: 2597969

Ms. Paula Kelly, Senior Planner
City Hall
City of Irwindale
5050 Irwindale Avenue
Irwindale, CA 91706

Dear Ms. Kelly:

Materials Recovery Facility and Transfer Station

The County Sanitation Districts of Los Angeles County (Districts) received a Notice of Preparation of a Draft Environmental Impact Report for the subject project on May 15, 2013. The proposed development is located within the jurisdictional boundaries of District No. 22. We offer the following comments regarding sewerage service:

1. The proposed project may require a Districts' permit for Industrial Wastewater Discharge. Project developers should contact the Districts' Industrial Waste Section at extension 2900, in order to reach a determination on this matter. If this permit is necessary, project developers will be required to forward copies of final plans and supporting information for the proposed developments to the Districts for review and approval before beginning project construction. For additional Industrial Wastewater Discharge Permit information, go to http://www.lacsd.org/wastewater/industrial_waste/permit.asp.

2. The wastewater flow originating from the proposed project will discharge to a local sewer line, which is not maintained by the Districts, for conveyance to the Districts' Baldwin Park Trunk Sewer, located in Ramona Parkway at Grace Avenue. This 18-inch diameter trunk sewer has a design capacity of 4.8 million gallons per day (mgd) and conveyed a peak flow of 1.0 mgd when last measured in 2009.

3. The wastewater generated by the proposed project will be treated at the San Jose Creek Water Reclamation Plant (WRP) located adjacent to the City of Industry, which has a design capacity of 100 mgd and currently processes an average flow of 76.6 mgd. Wastewater flows that exceed the capacity of the San Jose Creek WRP, and all biosolids, are diverted to and treated at the Joint Water Pollution Control Plant located in the City of Carson.

4. The expected average wastewater flow from the project site is 8,436 gallons per day. For a copy of the Districts' average wastewater generation factors, go to www.lacsd.org, Wastewater & Sewer Systems, Will Serve Program, and click on the Table 1, Loadings for Each Class of Land Use link.

Recycled Paper

5. The Districts are authorized by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts' Sewerage System or increasing the strength or quantity of wastewater attributable to a particular parcel or operation already connected. This connection fee is a capital facilities fee that is imposed in an amount sufficient to construct an incremental expansion of the Sewerage System to accommodate the proposed project. Payment of a connection fee will be required before a permit to connect to the sewer is issued. For a copy of the Connection Fee Information Sheet, go to www.lacsd.org, Wastewater & Sewer Systems, Will Serve Program, and click on the appropriate link. For more specific information regarding the connection fee application procedure and fees, please contact the Connection Fee Counter at extension 2727.

6. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the design capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CAA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise you that the Districts intend to provide this service up to the levels that are legally permitted and to inform you of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2717.

Very truly yours,

Grace Robinson Chan

Adriana Raza
Customer Service Specialist
Facilities Planning Department

AR: ar

Doc #: 2597969.D22

The Canyon City — Gateway to the American Dream

June 12, 2013

Ms. Paula Kelly
Senior Planner
City of Irwindale
5050 North Irwindale Avenue
Irwindale, California 91706
paulakelly@ci.irwindale.ca.us

Re: Irwindale Materials Recovery Facility and Transfer Station Notice of Preparation of a Draft Environmental Impact Report

Dear Ms. Kelly:

Thank you for providing the City of Azusa ("Azusa") the opportunity to review the Notice of Preparation ("NOP") for the above-referenced project (the "Project"). The scoping process is our opportunity to ensure that issues important to Azusa residents and businesses are addressed early in the environmental review process.

As neighboring cities we share many of the resources within our region, and a project within one of our region's cities may affect another's residents and businesses. Keeping in mind the fact that the Project may impact the residents and businesses of Azusa, the City of Azusa has the following comments:

- Project Description — We have concerns regarding whether the "Project variant" will be thoroughly addressed. The NOP states that the Project variant would result in no overnight parking for transfer trucks, and thus third party "sub-hauler" vendors would be required instead of transfer trucks owned by the applicant. This change in the method of operations for the Project could result in different impacts (e.g., traffic impacts) as third party operators may choose a multitude of different access options to the project site, and may not follow any route restrictions that are imposed on the Project due to traffic impact concerns. Please ensure that these concerns are addressed in the analysis of the Project variant.

- Project Description — Azusa was previously informed that an off-site lot on Vincent Avenue was being considered for use by the Project as truck storage. Is this still part of the Project? This off-site lot is located directly across from apartments in Azusa, and any direct or indirect impacts on those sensitive receptors should be addressed.

- Air Quality – Please evaluate the effects of airborne pollutants on nearby residents and businesses and the plants, wildlife, and human users of the Santa Fe Dam Recreation Area.

- Hazards—Please identify LEA requirements for any clean-up needed on-site due to contamination issues, and analyze how the Project proposes to meet those requirements.

- Noise -- Please evaluate the effect of vehicle and facility noise on nearby residents and businesses and the plants, wildlife, and human users of the Santa Fe Dam Recreation Area. Please pay special attention to the 24-hour operations period of the Project.

- Odors - Please give details as to the various measures and operating guidelines that will be used to control odors emanating from the Project.

- Operating Hours – Within all the categories studied, please evaluate the effect of the 24-hour operations schedule. Specifically, consider the effect of truck noise during the evening, night, and early morning hours.

- Project Alternatives – Please evaluate locations within Irwindale and those outside for this Project. Additionally, given the recent approval of the Waste Management MRF very close by the proposed site of the Project, consider the "no project" alternative.

- Cumulative Impacts—On a related note, please include the Waste Management MRF project on the list of "related projects" for the purposes of determining the Project's cumulative impacts.

- Santa Fe Dam Recreation Area – Please evaluate the Project's effect on noise, odor, trash, air quality, and water quality on the plants, wildlife, and human users of the Santa Fe Dam Recreation Area. The recreation area is widely used and at least one trail is close to the Project. Please pay special attention to the effect of the 24-hour operations of the Project.

- Water Infrastructure – please evaluate whether the Project will require upgrades to the both incoming and wastewater infrastructure systems.

Once again, on behalf of the City of Azusa, I would like to thank you for the opportunity to respond to the Project's NOP and share some of our concerns. We look forward to seeing those issues addressed in the Project's Environmental Impact Report. If you would like to further discuss these comments or have any questions, please do not hesitate to contact me.

Sincerely,



Kurt Christiansen, Director of Economic
& Community Development

Kurt Christiansen, Director of Economic & Community Development
213 E. Foothill Blvd., Azusa, CA 91702
kchristiansen@ci.azusa.ca.us – 626.812.5236

June 14, 1993

regarding recovery and transfer station

Paula Kelly -

Baldwin Park is the worst place to put this project. It is very close to Santa Fe Dam recreational area that serves hundreds of families during the summer months. Also there is a bike trail that goes to the beach. Most of the homes are older and don't have air conditioning unlikely they can filter out pollution.

There are numerous schools in the area.

also. Maine St is one of the few streets to goes north out of Baldwin Park, we don't need more traffic congestion

why don't you put it up around where the rock quarries are?

Read the article I have enclosed. I don't know where you are on the list but it must be better than Baldwin Park.

Sincerely
Jessie Almeda

do not pollute the dirty air we already breath.

J. A.

Don't just post this down. Read it J. Almada

New pollution study ranks Los Angeles areas in top 10 worst in state

By Steve Scauzillo @stevscaz on Twitter San Gabriel Valley Tribune
Posted:

sgvtribune.com

Related story: Region makes strides but still among worst in ozone levels

A statewide snapshot measuring the cumulative impact of pollution on public health reported that of the top 10 percent most polluted ZIP codes in the state, half are in Southern California. Three Los Angeles County communities are especially burdened: East Los Angeles, Vernon and Baldwin Park, according to CalEnviroScreen 1.0, an interactive tool released Tuesday by the California Environmental Protection Agency.

The study, along with a database and an interactive map, was billed as the first of its kind by Cal/EPA.

"In the past, we've looked at each type of pollutant. This is an attempt to look at multiple pollutants," said Sam Delson, a spokesman for the Cal/EPA Office of Environmental Health Hazard Assessment.

Communities within the top 5 percent included: Oxnard, Pacoima, Sun Valley, parts of Los Angeles, part of Whittier, Norwalk, East Los Angeles, Boyle Heights, Downey, Bell, Vernon, Paramount, Lynwood, Compton, Wilmington, Santa Fe Springs, Pico Rivera, El Monte, Baldwin Park, Irwindale, Pomona, Ontario, Fontana, Rialto, Colton, San Bernardino and Perris.

Those in the top 6 to 10 percent included: Palmdale, Sylmar, Port Hueneme, Inglewood, Bellflower, Artesia, La Canada Flintridge, Azusa, Rosemead, South Gate, Monterey Park and parts of Rancho Cucamonga, Chino and Riverside.

"I'm not surprised by this outcome," said Baldwin Park Councilwoman Marlen Garcia. "I've been saying for years the city of Baldwin Park should be considered a hot spot."

She pointed to the proximity of the city's 76,000 residents to the heavily used 10 and 605 freeways and the mining activity in and surrounding the city as sources of air pollution.

Is this not a reason to stop this project

Baldwin Park's Pollution Burden Score was 8.4 out of 10, the highest in the state. East Los Angeles's score, 7.6, and Vernon's score, 7.2, also placed them among the 10 most polluted ZIP codes.

The other seven areas in the top 10 are in the more rural San Joaquin Valley: three ZIP codes in Fresno, three areas in Stockton and one in Bakersfield.

A community's pollution burden was calculated using 11 environmental factors, including smog, proximity to high-trafficked roadways and freeways, landfills, industrial plants, groundwater, pesticides and poisoned waterways.

The study also looked at community characteristics such as poverty levels, ethnicity, children, the elderly, asthma rates and English language proficiency.

The study is a result of legislation passed in 2004 that requires Cal/EPA to identify disadvantaged communities in cleanup and permitting decisions. Studies show that minorities are more affected by pollution because they live near pollution hot spots, such as freeways and landfills.

Communities in the top 10 percent ranking can addresses environmental justice issues by gaining access to grants from the state's new cap-and-trade auctions, Delson said.

Under California's landmark AB 32 law adopted to reduce greenhouse gases that cause global climate change, emitters can buy or trade allowances in order to stay within the emissions cap.

The state has held two such auctions so far and the next will take place May 16. The governor's budget estimates the auctions will generate $200 million for AB 32 projects, said H.D. Palmer, analyst with the State Department of Finance. In 2013-14, Palmer estimates the pot will double.

"We are trying to find ways to promote the environmental health of these communities and that will eventually lead to economic vitality," Delson said.

Though no specific projects have been identified, said Palmer, there will be opportunities for pollution-burdened areas.

Projects the state could c infrastructure for low and zero-emission vehicl ld also be considered by the state to lower the amc ollution areas.

"You need to have that d and enforcement needed," said Penny New Community Action and Environmental Justice in elped gather the data for the" study.

Former Baldwin Park pla ior planning associate with Evan Brooks Associ as excited about

funneling grant money to cities such as Vernon, East L.A. and Baldwin Park for tree plantings, parks and bike paths.

"Now I will know what to look for in the future in terms of these cap-and-trade grants," he said.

The South Coast Air Quality Management District has singled out two communities for environmental justice work, Boyle Heights and San Bernardino, said spokesmanSam Atwood.

In Boyle Heights, residents live close to the 5 and 60 freeways. The report cites the 2013 study that said children exposed to traffic-related pollution were 15 percent more likely to be diagnosed with autism than children of mothers living further from freeway and automobile exhaust.

Residents of San Bernardino who live near the Santa Fe Railyard have a higher cancer risk due to diesel soot emissions from trains, he said.

To reduce exposure, the SCAQMD through its Clean Communities program has installed air filters in K-12 classrooms in Boyle Heights and San Bernardino, he" said.

While the air district used grant money from the U.S. Environmental Protection Agency, Atwood said the agency "will definitely take a look at that (AB 32) as an additional funding source."

In Vernon, the high ranking can be attributed to heavy industrial uses as well as emissions from the 710 Freeway, Atwood surmised.

"For some communities like Vernon and those in the San Fernando Valley (such as Pacoima, parts of North Hills and Sun Valley), these analyses show us that we need to make better planning decisions," said Martha Arguello, executive director of Physicians for Social Responsibility-Los Angeles.

One way would be to attract green manufacturers. "These cities risk cup is overflowing and we need to act to help them," she said.

Nonprofit groups, such as the Center for Community Action and Environmental Justice, and Amigos de los Rios, a grass-roots environmental action group that is working on greening the Rio Hondo and San Gabriel rivers in El Monte and Baldwin Park, both saw the need for more parks and green spaces in polluted areas.

"It is heartbreaking to see children who live in one of these communities who live near a freeway or next to a mining operation. They don't go outside as much and they are

vulnerable to other health impacts, such as diabetes," said Claire Robinson. managing director for Amigos de los Rios. "We are in a serious crisis."

Los Angeles News Group Staff Writers Beau Yarbrough and Mariecar Mendoza also contributed to this report.

Santa Fe dam is used by hundreds of people who have recently decided to go for jogging. Also there are many schools in the general area -

Planning Department

July 8, 2013

Paula Kelly,
Senior Planner
Community Development Department
5050 Irwindale Avenue
Irwindale, CA 91706

Re: Scoping Meeting for the Materials Recovery Facility and Transfer Station

Dear Ms. Kelly:

The City of West Covina Planning Department appreciates this opportunity to provide written input into the potential effects of the proposed Materials Recovery Facility and Transfer Station (MRF/TS) located at the corner of Live Oak Avenue and Arrow Highway. We would request the evaluation of truck routes for delivering materials to and from the MRF/TS and the evaluation of air quality effects given prevailing wind currents(including odor impacts), in regards to the effects on properties within the City of West Covina.

Thank you for notifying us of the scoping meeting. If you have any questions please feel free to contact me at (626) 939-8423.

Sincerely,

Jeff Anderson
Planning Director

Valley County Water District
14521 Ramona Boulevard
Baldwin Park, CA 91706

(626) 338-7301
(626) 814-2973 Fax

July 12, 2013

Ms. Paula Kelly, Senior Planner
City of Irwindale
5050 N Irwindale Avenue
Irwindale, Ca 91706

Re: Comments to the July 9, 2013 City of Irwindale Environmental Impact Report Scoping Meeting for the Proposed Athens Materials Recovery Facility and Transfer Station

Ms. Kelly,

Valley County Water District (District) owns and operates the Clinton O. Nixon Water Pumping Facility, which includes established groundwater production facilities, above-ground water storage facilities, and water booster pumping facilities, and is located immediately southeast of the proposed Athens Materials Recovery Facility and Transfer Station (MRF/TS) project. The Clinton O. Nixon Water Pumping Facility is one of the most critical components to the District's water supply for its service area. The District is mandated to comply with all State of California Department of Public Health (CDPH) standards and regulations for water quality, public health, and water facility security measures. Below are the primary concerns of the District in relation to the proposed Athens MRF/TS project as discussed at the City of Irwindale Environmental Impact Report (EIR) Scoping Meeting held on July 9, 2013:

1. It was mentioned that the proposed Athens MRF/TS project would be equipped with odor control capabilities to manage air quality. The two existing Clinton O. Nixon storage facilities have ventilation that allows an exchange of air inside the reservoir due to the rise and fall of the water surface within the reservoir. The air exchange is directly correlated to water demand – the higher the demand, the more the water level fluctuates, which draws or pushes air in and out of the reservoirs. At times, the air inside the reservoirs can reside for many hours leading to possible adsorption of air contaminates into the water. The concern of the District is for the possibility of odor discharge from the proposed Athens MRF/TS project adding a water quality issue to the District's water supply system. There are many water quality standards that include primary and secondary constituents of concern. Secondary constituents of concern include taste and odor.

2. It was mentioned that there would be an increase in waste disposal truck traffic in the vicinity of the proposed Athens MRF/TS project, which will increase exhaust emissions. The District has the same concern for increased exhaust emissions as airborne odors, as stated in Item 1 above.

3. It was mentioned that the proposed Athens MRF/TS project will manage pests. Pests are a known source of disease. The District needs to understand how pests will be managed and what steps will be taken to confine pests to the proposed Athens MRF/TS project site.

4. It was mentioned that the proposed Athens MRF/TS project may need to store toxic waste from the materials recovery process for a period of 24 to 36 hours on site. The concern of the District is for the leaching of toxic waste into the ground and ultimately into the groundwater. The District produces a significant quantity of groundwater from the Clinton O. Nixon Water Pumping Facility, and once the water is treated, it is delivered to the community as potable drinking water. The District is concerned about the integrity of the waste containment systems proposed for the Athens MRF/TS project site, including containment during times of seismic activity.

5. It is assumed that the proposed Athens MRF/TS project will require potable water for wash down of the materials recovery process machinery. As such, the District requests information regarding where this waste stream will be discharged, including the risks for leaching of the waste stream into the ground and ultimately into the groundwater.

The District requests special analyses be performed that address the aforementioned concerns as the results will be shared with the CDPH as part of an amendment to the District's potable water operating permit for the proposed Live Oak Avenue Reservoir Project, which will be located on the north side of Live Oak Avenue west of Arrow Highway.

If you have any questions pertaining to the information provided, please contact me at your convenience at (626) 338-7301 ext. 201 or lnoriega@vcwd.org.

Sincerely,

Lynda Noriega
General Manager
VALLEY COUNTY WATER DISTRICT

TRY 3 TO Fax 3 TIMES

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: KEN WOODS

Ph. 962-5298

Street address: 15261 E Badillo St

City / State / Zip: Baldwin Park, CA. 91706

Comments: ONE of my many concerns regarding this MRF is truck traffic. I live & work near this facility. You say there will be a signal on Arrow Hiway at the entrance. My concern are the trucks coming from the South & East, cutting thru Baldwin Park. I can just imagine 20, 30, 40 trucks lined up along Arrow Hiway and down Baldwin Park Blvd. Waiting to turn left into this facility!

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018,** or by e-mail: **paulakelly@ci.irwindale.ca.us**

1365

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: Sarah Cruz

Street address: 5135 Larry Ave

City / State / Zip: Baldwin Park 91706

* Do Not What this facility here!!

Comments:

The traffic in this area is already very busy with trucks from the waste management and the recycling center are on the same area.
Check the reports on accidents as there are quit a few on that location already — This end of Baldwin Park already has the worst air pollution and we also have the free way on + off Ramps near by also —

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018**, or by e-mail: **paulakelly@ci.irwindale.ca.us**

305

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name:

Street address:

City / State / Zip:

Comments: This will be right by a food distribution area - schools and recreational park (dam). Do not want anymore smells near my home or using my street as a alternate when Irwindale is congested or there is an accident there. They come speeding down Barranca like a freeway there are small kids & that time here!!

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018**, or by e-mail: **paulakelly@ci.irwindale.ca.us**

3825

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name:

Street address:

City / State / Zip:

Comments: We have alot of long time residents here that pass their homes from generations to generations rising there kids & grandkids & great grandkids to get this new facility somewhere near your homes see how you like it.

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018**, or by e-mail: **paulakelly@ci.irwindale.ca.us**

485

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name:

Street address:

City / State / Zip:

Comments: Baldwin Park will not get any Tax Revenue out of this!!
of
Not fair - to Homeowners
Our # 626 665 4998 -
Saved from work -

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018**, or by e-mail: **paulakelly@ci.irwindale.ca.us**

505

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name:

Street address:

City / State / Zip:

Comments: Also can you make the meetings any earlier as some people do have jobs 4:00pm really!!

I thought this issue was closed now this Tuesday – Big Bisness no one care's anymore about the working Class people only out to make money

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018,** or by e-mail: **paulakelly@ci.irwindale.ca.us**

(1)

IRWINDALE

1 OF 3

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: JANE & JOHN MAGUIRE

Street address: 5112 BALDWIN PARK BLVD

City / State / Zip: BALDWIN PARK, CA 91706

Comments: WE ARE DISAPPOINTED THE CITY SCHEDULED THIS meeting SO EARLY (PERHAPS TO AVOID THE PEOPLE WHO WERE STILL AT WORK?) THIS MRF SHOULD NOT BE BUILT NEAR THE HOMES OF THE RESIDENTS OF BALDWIN PARK! BUILD IT CLOSE TO YOUR OWN RESIDENTS! WE CANNOT AFFORD TO MOVE. MOST OF OUR RESIDENTS ARE HISPANIC & "ENVIROMENTAL JUSTICE" SHOULD PLAY A MAJOR ROLE! WE SHOULD NOT BE HELD HOSTAGE TO THE INCREASE IN TRAFFIC, AIR POLUTION, LIGHT, NOISE & THE FURTHER DISRUPTION OF OUR NEIGHBORHOOD! NOT TO MENTION THE IMPACT ON OUR PROPERTY VALUES! WE ALREADY HAVE THE ALLAN CO, WASTE MANAGEMENT & BOATLOADS OF TRAFFIC!

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018,** or by e-mail: **paulakelly@ci.irwindale.ca.us**

(2)

IRWINDALE

2 OF 3

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: JANE & JOHN MAGUIRE

Street address: 5112 BALDWIN PARK BLVD

City / State / Zip: BALDWIN PARK, CA 91706

Comments: WE PUT UP WITH THE DUST FROM THE MINING INDUSTRY & TRUCK TRAFFIC, WHICH ONLY BENEFITS IRWINDALE NOW YOUR ARE TRYING TO SHOVE A MRF DOWN OUR THROATS JUST TO ADD TO YOUR OWN COFFERS! THIS FACILITY WOULD BE 500 Ft. FROM OUR HOME!! WE HAVED LIVED HERE 45 YEARS. WHY SHOULD WE BE EXPOSED TO ALL OF THIS JUST TO BENEFIT IRWINDALE?? MONEY MONEY, MONEY! ALWAYS ABOUT MONEY. WHAT ABOUT CONSIDERATION & COMPASSION FOR YOUR NEIGHBORS?? THE BALDWIN PARK PEOPLE? NOT IRWINDALE PEOPLE!

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018,** or by e-mail: **paulakelly@ci.irwindale.ca.us**

3

IRWINDALE

3 OF 3

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: VANEY JOHN MAGUIRE

Street address: 5112 BALDWIN PARK BLVD

City / State / Zip: BALDWIN PARK, CA 91706

Comments: YOU OPPOSED THE WASTE MANAGEMENT MRF ON IRWINDALE AVE & GLADSTONE in AZUSA & THAT IS NOT EVEN CLOSE TO YOUR RESIDENTS! STATE OF THE ART MEANS NOTHING. THINGS CAN & DO GO WRONG! YOU ARE PROPOSING 24hr/7 DAYS A WEEK! THIS WHOLE MRF IS OUTRAGEOUS & WE STRONGLY OPPOSE & OBJECT to it's BEING BUILT ACROSS THE STREET FROM OUR HOME!

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018,** or by e-mail: **paulakelly@ci.irwindale.ca.us**

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: Mario A. Cruz

Street address: 5125 north Landis Ave

City / State / Zip: Baldwin Park CA 91706

Comments: This facility will increase ~~the~~ Already congested streets. not only that but our drinking water is right across the street and could possibly be contaminated with all the waste that will be dumped. it too close to homes our homes. There is already A Recycling center down the street and one is near completion on the corner of Irwindale and Gladstone We dont need or want this facility in our community.

7-10-13

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018**, or by e-mail: **paulakelly@ci.irwindale.ca.us**

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: Jesus Ramirez

Street address: 5131 Landis ave

City / State / Zip: Baldwin Park Ca 91706

Comments: No estoy de acuerdo en que construyan este centro de reciclaje aqui porque siempre ba a ber mal olor muchas moscas ratones y más animales tambien mucho trafico el valor de nuestras casas bra para bajo, lo mas importante de no querer esa facility aqui porque para mi significa muchas enfermedades, por favor les suplico de la manera mas atenta que no lo agan aqui esta muy cerca de muchos hogares.

Jesus Ramirez 7-12-13

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018,** or by e-mail: **paulakelly@ci.irwindale.ca.us**

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: Manuel Chavez

Street address: 14373 Joanbridge St.

City / State / Zip: Baldwin park CA 91706

Comments: as a Recident my concern will be the Rodents, Fowl smell and traffic it can create.
possible universal House Hold Waste that might NOT get Recycled properly and ends up in the transfer station, chemicals seeping through the ground into our Water Table.

Thank you

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018**, or by e-mail: **paulakelly@ci.irwindale.ca.us**

2 of 2

(8) Transfer station will also cause CH.P to do check Points - creating traffic Jam on Main Roads.

(9) what happens when older trucks break down on main Roads?

1 of 2

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: F. Javier Torres

Street address: 5134 N. Lanas Ave

City / State / Zip: Baldwin Pk (Ala.) 91706

Comments:

(1) what becomes of the hazardous waste from housing?
(2) Bad odors from the facility?
(3) Is it not too close to the food packaging facility?
(4) Traffic from dump-trucks, what will be the impact?
(5) Trucks transporting debris down streets - leaking fluids from wet garbage?
(6) There is already a transfer site being built, why another one?
(7) Is there going to be a fuel facility on site? what about leakage?

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018,** or by e-mail: **paulakelly@ci.irwindale.ca.us**

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: Miguel ESCOTO

Street address: 4552 HARLAN AVE

City / State / Zip: BP, CA 91706

Comments: HAZARDOUS MATERIALS RECOVERY FACILITY NEAR OUR CLEAN WATER SOURCE IS NOT Recommended

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018,** or by e-mail: **paulakelly@ci.irwindale.ca.us**

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: ERNIE CARDONA

Street address: 13421 BENBOW ST.

City / State / Zip: B.P. 91706

Comments: HAZARDOUS MATERIALS RECOVERY FACILITY NEAR OUR CLEAN WATER SOURCE is NOT RECOMMENDED.

Ernie Cardona 7/10/13

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018,** or by e-mail: **paulakelly@ci.irwindale.ca.us**

IRWINDALE

Irwindale Materials Recovery Facility & Transfer Station EIR

Comment Card – Please Print

Name: Leon Ornelas

Street address: 5136 Baldwin Park BL

City / State / Zip: Baldwin Park 91706

Comments: Hazardous waste / traffic contamination matter

Please provide your comments in the space above and add additional sheets, if desired. Comments may be submitted today, or by Friday, July 12, 2013, to: Ms. Paula Kelly, Senior Planner, 5050 N. Irwindale Blvd, Irwindale, CA 91706, or by fax at: **(626) 962-2018**, or by e-mail: **paulakelly@ci.irwindale.ca.us**

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #2013051029

Project Title: Irwindale Materials Recovery Facility & Transfer Station

Lead Agency: City of Irwindale | Contact Person: Paula Kelly
Mailing Address: 5050 N. Irwindale Avenue | Phone: 626.430.2200
City: Irwindale | Zip: 91706 | County: Los Angeles

Project Location: County: Los Angeles | City/Nearest Community: City of Irwindale
Cross Streets: NW corner of Live Oak Avenue and Arrow Highway | Zip Code: 91706
Longitude/Latitude (degrees, minutes and seconds): 34 ° 6 ′ 15 ″ N / 117 ° 58 ′ 0 ″ W | Total Acres: 17
Assessor's Parcel No.: 8535-001-911 | Section: 6 | Twp.: 1S | Range: 10W | Base: SBB&M
Within 2 Miles: State Hwy #: Interstates 605 & 210 | Waterways: San Gabriel River
Airports: none | Railways: SPRR | Schools: Heath, Landis, Geddes

Document Type:

CEQA: ☐ NOP ☑ Draft EIR ☐ NEPA: ☐ NOI Other: ☐ Joint Document
☐ Early Cons ☐ Supplement/Subsequent EIR ☐ EA ☐ Final Document
☐ Neg Dec (Prior SCH No.) ☐ Draft EIS ☐ Other:
☐ Mit Neg Dec Other: ☐ FONSI

RECEIVED
APR 01 2014
4:20 P.M.
STATE CLEARING HOUSE

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☑ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☐ Use Permit ☐ Coastal Permit
☐ Community Plan ☑ Site Plan ☐ Land Division (Subdivision, etc.) ☑ Other: ZOA, DA, DDA

Development Type:

☐ Residential: Units _____ Acres _____
☐ Office: Sq.ft. _____ Acres _____ Employees _____
☐ Commercial: Sq.ft. _____ Acres _____ Employees _____
☑ Industrial: Sq.ft. 247,000 Acres 17 Employees 345
☐ Educational: _____
☐ Recreational: _____
☐ Water Facilities: Type _____ MGD _____

☐ Transportation: Type _____
☐ Mining: Mineral _____
☐ Power: Type _____ MW _____
☐ Waste Treatment: Type _____ MGD _____
☐ Hazardous Waste: Type _____
☑ Other: MRF/TS with maximum capacity up to 6,000 tons/day

Project Issues Discussed in Document:

☑ Aesthetic/Visual ☐ Fiscal ☑ Recreation/Parks ☐ Vegetation
☑ Agricultural Land ☐ Flood Plain/Flooding ☑ Schools/Universities ☑ Water Quality
☑ Air Quality ☑ Forest Land/Fire Hazard ☐ Septic Systems ☑ Water Supply/Groundwater
☑ Archeological/Historical ☑ Geologic/Seismic ☑ Sewer Capacity ☐ Wetland/Riparian
☑ Biological Resources ☑ Minerals ☑ Soil Erosion/Compaction/Grading ☑ Growth Inducement
☐ Coastal Zone ☑ Noise ☑ Solid Waste ☑ Land Use
☑ Drainage/Absorption ☑ Population/Housing Balance ☑ Toxic/Hazardous ☑ Cumulative Effects
☐ Economic/Jobs ☑ Public Services/Facilities ☑ Traffic/Circulation ☑ Other: Env. Justice

Present Land Use/Zoning/General Plan Designation:

The site is presently vacant and disturbed. Heavy Manufacturing (M-2) zone / commercial land use designation.

Project Description: *(please use a separate page if necessary)*

Athens Services (Applicant/Operator) has submitted an application to the City of Irwindale (City) to construct and operate a Materials Recovery Facility and Transfer Station (MRF/TS), with a Fueling Facility/Convenience Store. A MRF/TS is a facility where residential, commercial, and/or industrial municipal solid waste and recyclable materials are delivered by commercial and non-commercial haulers, and sorted and processed in one central location prior to delivery at end use distributors.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

X Air Resources Board
____ Boating & Waterways, Department of
X California Highway Patrol
X Caltrans District # 7
____ Caltrans Division of Aeronautics
X Caltrans Planning
____ Central Valley Flood Protection Board
____ Coachella Valley Mtns. Conservancy
____ Coastal Commission
____ Colorado River Board
____ Conservation, Department of
____ Corrections, Department of
____ Delta Protection Commission
____ Education, Department of
____ Energy Commission
____ Fish & Game Region # ____
____ Food & Agriculture, Department of
____ Forestry and Fire Protection, Department of
____ General Services, Department of
X Health Services, Department of
____ Housing & Community Development
X Integrated Waste Management Board
X Native American Heritage Commission

____ Office of Emergency Services
____ Office of Historic Preservation
____ Office of Public School Construction
X Parks & Recreation, Department of
____ Pesticide Regulation, Department of
____ Public Utilities Commission
X Regional WQCB # 4
____ Resources Agency
____ S.F. Bay Conservation & Development Comm.
X San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
____ San Joaquin River Conservancy
____ Santa Monica Mtns. Conservancy
____ State Lands Commission
____ SWRCB: Clean Water Grants
____ SWRCB: Water Quality
____ SWRCB: Water Rights
____ Tahoe Regional Planning Agency
X Toxic Substances Control, Department of
X Water Resources, Department of

X Other: CA Dept of Resources Recycling and Recovery
____ Other: (CalRecycle)

Local Public Review Period (to be filled in by lead agency)

Starting Date April 2, 2014 Ending Date May 16, 2014

Lead Agency (Complete if applicable):

Consulting Firm: N/A
Address:
City/State/Zip:
Contact:
Phone:

Applicant: Athens Services
Address: 14048 Valley Boulevard
City/State/Zip: City of Industry, CA 91746
Phone: 626.336.3636

Signature of Lead Agency Representative: J. Harvey for P. Kelly **Date:** 04/01/14

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

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California Dept. of Conservation
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Third Party Environmental Review
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Rosemead, CA 91770

Ahmad Solomon, Region Manager
Local Public Affairs
Southern California Edison
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300 sq ft. list
42 total

1 8535-001-911
IRWINDALE CITY
150 IRWINDALE AVE
WINDALE CA 91706-2133 C031

2 8533-003-270/8535-001-275,276,277/8536-001-273
L A CITY DEPT OF WATER & POWER
PO BOX 51111
LOS ANGELES CA 90051-5700 B903

3 8535-001-909
U S GOVT
1849 'C' ST NW
WASHINGTON DC 20240

4 8535-001-022
LBA RIV-CO XX LLC
5305 RIVERGRADE RD
IRWINDALE CA 91706-1347 C057

5 8535-001-034
REALTY ASSOCIATES FUND V L P
5901 PRIESTLY DR #200
CARLSBAD CA 92008-8825 C026

6 8535-001-033
H N & FRANCES C BERGER FOUN
PO BOX 13390
PALM DESERT CA 92255-3390 B032

7 8535-001-027
CHOW KOU TIEN ING NAM YU
5288 RIVERGRADE RD
IRWINDALE CA 91706-1336 C057

8 8535-001-031
SHALABI ENTS PARTNERS FARID O TR
13985 LIVE OAK AVE
IRWINDALE CA 91706-1332 C057

9 8535-002-010,025,026,046
OFT FAMILY CORPORATION
402 SEVILLE AVE
NEWPORT BEACH CA 92661-1529 C001

10 8536-001-022
INFINITI ENT LLC
3710 ROCKWELL AVE #G
EL MONTE CA 91731-4515 C014

11 8536-001-024
DEVOS PROPERTIES LLC
710 S AYON AVE
AZUSA CA 91702-5123 C017

12 8536-001-023
MONTELEONE DONALD & BETTY FAMILY
4935 DEL MONTE RD
LA CANADA CA 91011-2718 C012

13 8536-014-013
FLORES GABRIELA MEDINA CARLOS
14101 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

14 8536-014-012
KOO CHARLES
158 W SANDRA AVE
ARCADIA CA 91007-8524 C014

15 8536-014-011
GONZALEZ WILLIAM O & EVELYN M
14113 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

16 8536-014-010
ROMO ANTONIO
14119 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

17 8536-014-009
NGUYEN LIEM & P R LIVING TRUST
14123 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

18 8536-014-008
ARMENDARIZ ROSARIO
14129 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

19 8536-014-006,007
ELSER DONALD L ELSER TRUST
1948 CUMBERLAND RD
GLENDORA CA 91741-3927 C030

20 8536-014-005
AVILA JOSE
14143 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

21 8536-014-004
CERVANTES PATRICIA
14149 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

22 8536-014-003
HERNANDEZ ANA M & MARIO J
14155 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

23 8536-014-002
HERNANDEZ BELLA A
14159 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

24 8536-014-001
LIANG SHAOSHU & YAN X
14165 JOANBRIDGE ST
BALDWIN PARK CA 91706-1519 C024

25 8536-014-017
LIVE OAK COMMERCE CENTER LLC
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UPLAND CA 91785-0670 B007

26 8536-014-016
LEWIS DEVELOPMENT CO
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UPLAND CA 91785-0670 B007

27 8536-016-901
BALDWIN PARK CO WATER DIST
14521 RAMONA BLVD
BALDWIN PARK CA 91706

8536-016-018
BLENKINSHIP JOHN & KAREN FAMILY
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GLENDORA CA 91741-2747 C027

29 8536-016-013,014,015,016
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SAN DIMAS CA 91773-2775 C004

30 8536-016-007
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EL MONTE CA 91732

31 8536-016-008
MAYA ROLANDO
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BALDWIN PARK CA 91706-1758 C029

32 8536-016-009
COBLAN SOCORRO & JOSE N
14329 JOANBRIDGE ST
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33 8536-019-014
CRUZ JOSE H & FAITH E
5135 LARRY AVE
BALDWIN PARK CA 91706-1630 C029

34 8536-019-013
MCCARTY MIKE
5131 LARRY AVE
BALDWIN PARK CA 91706-1630 C029

35 8536-019-016
MENDOZA SANDRA T
5130 LANDIS AVE
BALDWIN PARK CA 91706-1625 C029

36 8536-019-015
TORRES FRANCISCO J & CLAUDIA P
5134 LANDIS AVE
BALDWIN PARK CA 91706-1625 C029

37 8536-020-016
RAMIREZI JESUS & MARIA L
5131 LANDIS AVE
BALDWIN PARK CA 91706-1626 C029

38 8536-020-017
OZAETA FELICIANO P & EMERITA L
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BALDWIN PARK CA 91706-1626 C029

39 8536-020-018
ORNELLAS LEON & BARBARA
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BALDWIN PARK CA 91706-1605 C029

40 8536-020-019
SOTO RENEE A
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BALDWIN PARK CA 91706-1605 C029

IRWINDALE CITY
CITY MANAGER
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IRWINDALE CA 91706

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PLANNING DEPT
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CITY MANAGER
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City Manager
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South Pasadena, CA 91030

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Revised NOP List w/HQMD
Recirculated 2014 EIR
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Congresswoman Judy Chu
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Pasadena, CA 91101

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[illegible]st Covina, CA 91790

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Appendix B
On-Site Management Plans

Table of Contents

Appendix B – On-Site Management Plans

PDF #1 - Athens Services Litter Prevention Program

PDF #2 - Athens Services Pest Control Program

PDF #3 - Athens Services Odor Control Program

PDF #4 - Athens Services Noise Control Program

PDF #5 - Athens Services Hazardous Materials Program

PDF #6 - Athens Services Fire Prevention Control and Mitigation Plan

PDF #7 - Emergency Action Plan / Emergency Response Training Plan

The On-Site Management Plans for the *Irwindale Materials Recovery Facility and Transfer Station* have been developed by the Applicant (Athens Services) and are currently in use at their Materials Recovery Facility and Transfer Station located at 14048 East Valley Boulevard, in the City of Industry. These On-Site Management Plans (also referred to in the *Irwindale Materials Recovery Facility and Transfer Station Draft EIR* as Project Design Features [PDFs]) meet or exceed the minimum standards established by the California Integrated Waste Management Board (now CalRecycle), the County of Los Angeles, the South Coast Air Quality Management District, and/or other responsible agency, and have been reviewed by the Local Enforcement Agency for the Industry site. These plans will be adapted to the City of Irwindale site (Applicant's Project Correspondence letter dated April 16, 2009).

The On-Site Management Plans were reviewed in July 2014. As a result, PDF #3 - Athens Services Odor Control Program has been revised to reflect updated management practices."

ATHENS SERVICES MRF LITTER PREVENTION PROGRAM

Site litter prevention: The MRF and transfer station (including tipping area) are fully enclosed. The MRF site is swept routinely throughout the day by mechanical sweeper to pick up any litter on paved surfaces. A cleaning crew removes litter from landscaped areas. The site is surrounded by walls, fencing and landscaping to prevent any windborne litter from blowing offsite.

Roadway litter prevention: All materials brought to the MRF site are delivered in enclosed truck bodies or in covered debris boxes. Any vehicle leaving the site must be fully enclosed or tarped, and a sign is posted at the exit to remind drivers of this requirement. The facility keeps extra tarps on hand to replace faulty or missing tarps on vehicles. No uncovered vehicles are permitted to leave the site unless they are empty. All loads leaving the site are monitored to make sure they do not track out or drop materials onto public roadways as they depart.

Street sweeping: An Athens Services street sweeper will sweep the westbound curb lane of Live Oak Avenue, the eastbound curb lane of Arrow Highway, and the middle turn lane of Arrow Highway, adjacent to the facility, on a daily basis each day the facility is in operation.

ATHENS SERVICES MRF PEST CONTROL PROGRAM

The MRF pest control program consists of 3 protocols:

1) Facility design: the facility buildings are designed in such manner to facilitate cleaning and minimized hiding places that might harbor pests. Features of the design include construction using pest-proof materials such as metal and concrete; minimizing hiding places such as dark corners, crevices and inaccessible void spaces where debris might accumulate and pest may hide and breed; and ensuring that all areas of the facility including machinery pits, baler sumps, etc., are easily accessible and adequately lit for cleaning purposes.

2) Operational protocols: All areas of the facility, including tipping areas and work platforms, are swept daily either by hand or mechanical sweeper. Materials accepted at the facility for sorting are handled in a first-in, first-out basis and in all cases are processed and the remainder of unrecoverable wastes removed from the property within 48 hours of arrival. Recovered recyclable materials are also handled on a first-in, first-out basis and shipped out by individual load to minimize inventories and ensure older materials do not accumulate on site to act as a home for insects and vermin. Sorting machinery is cleaned thoroughly by dry methods on at least a weekly basis.

3) Professional inspection and eradication: The facility and surrounding site are inspected on at least a monthly basis, or more frequently as required, by a professional pest-control firm. Traps and baits will be placed and spraying for insects conducted in accordance with the recommendations of the pest-control firm in order to maintain the facility and site in a pest-free condition to the satisfaction of the Local Enforcement Agency.

ATHENS SERVICES MRF ODOR CONTROL PROGRAM

Equipment and facility design: In all of the areas that putrescible, green waste and commercial waste is dumped and processed the MRF will be fully enclosed with doors and exhaust fans. The exhaust fans will be equipped with spray nozzles that will spray water with an odor controlling agent.
Operational protocols: All paved areas outside of the buildings will be swept at least once each day. The tipping areas will be cleaned with a loader throughout the day. Work platforms and sorting equipment will be cleaned daily.

The exhaust fans and misting systems will be in full operation while the tipping, transfer, or sorting operations are taking place, and is run to the extent necessary during non-operational periods to ensure odors cannot escape from the closed facility. In the areas that putrescible waste is being processed the doors will be kept closed except when actually in use.

Materials are handled on a first-in, first-out basis such that waste, including residuals from the sorting process and waste brought to the facility for transfer, remains on site no longer than 48 hours after its arrival.

ATHENS SERVICES MRF NOISE CONTROL PROGRAM

Equipment and facility design: All tripping, transfer and sorting operations occur inside an enclosed building, with doors on all vehicle entrances and exits which are kept closed unless actually in use. The site perimeter is ringed by a masonry soundwall.

Operational protocols: Operations and maintenance may occur indoors 24/7. Facility doors are normally kept closed when not in use, particularly at night, to prevent escape of noise. Outdoor operations, maintenance, and construction activities are scheduled to ensure that any particularly noisy activities occur during normal weekday business hours.

All Athens Services vehicles accessing the site will be maintained with mufflers in good working order and backup alarms kept set at the lowest volume allowed by applicable regulations. Use of vehicle horns is discouraged on site except as necessary to alert workers of an emergency situation.

ATHENS SERVICES MRF HAZARDOUS MATERIALS PROGRAM

Procedure guidelines: This guideline is intended to provide basic direction to be followed to safely handle hazardous waste found during tipping floor or processing operations. Although Athens MRF and Transfer Station does not accept hazardous materials, from time to time we could receive some materials considered hazardous mixed with normal non-hazardous municipal solid waste loads.

Training: The MRF Leadership will become familiar with regulations concerning Hazardous Materials and ensure that all employees receive specific training as it relates to their job assignments. Special attention should be given to Tipping floor personnel including Forepersons and Spotters. Training will be performed periodically, and when an employee is assigned to a new position.

Load Checks: Every load coming into the tipping floor will be visually checked for any suspicious materials such as unlabeled containers, barrels, used motor oils, car batteries, etc. Random documented load checks will be performed daily at the direction of the tipping floor leadership. These inspections must be recorded in the appropriate form provided for that purpose.

Disposal: Any hazardous waste found must be removed using the appropriate protective equipment to the area(s) identified for temporary storage of such waste. The appropriate leader will be informed immediately to arrange moving the materials to the Hazardous Waste Storage Cabinet or hauled off site for proper disposal, as appropriate. Every ninety days or when the Storage Cabinet is full (whichever comes first), we will arrange for pick up and disposal of the materials by a licensed hazardous Waste Hauler.

Fire Prevention Control and Mitigation Plan

A. Description of the measures the operator will take to prevent fires and to control and extinguish fires at the site:

- Provide employee training on fire prevention, control and mitigation.
- Prohibit all open flame operations near flammable materials.
- Install fire protection sprinklers and portable fire extinguishers in all buildings
- Prohibit use of flammable solvents and chemicals around recycling and transfer operations.

B. Identification and description of the equipment the operator will have available (on site and readily available off-site) to control and extinguish fires;

- Fully sprinkled buildings.
- Portable fire extinguishers.

C. Description of the measures the operator will take to mitigate the impacts of any fire at the site to the public health and safety and the environment:

- Prohibit the use of flammable solvents and chemicals around the recycling, storage, and transfer operations.
- Train employees on handling hazardous and flammable materials.
- Store sufficient quantity of absorbent material, shovels and personnel protective equipment.

D. Description of the arrangements the operator has made with the local fire control authority having jurisdiction to provide fire prevention, control and suppression:

- The operator will provide the local fire control authority updated detailed site plan showing all buildings, structures, parking lots, storm & sanitary sewers, and adjacent property uses.
- Identify all materials stored onsite, access to each storage area, location of emergency equipment, general purpose of other areas within the facility, and location of all aboveground and underground tanks to include sumps, vaults, below-grade treatment systems, piping, etc.
- Map Key. Provide the following on the map:
    - A list of hazardous materials, including wastes.
    - Hazard class of each hazardous waste.
    - The maximum quantity for hazardous materials.
    - Include the contents and capacity limit of all tanks at each area and indicate whether they are above ground or below ground.
    - List separately any radioactives, cryogens and compressed gases for each facility.

E. Discussion of the ability of the local fire control authority to suppress fires at the site in light of the authority's personnel, expertise and equipment, the availability of water, access to the site and to flammable materials on the site, the nature of flammable materials on site, the quantity and dimensions of materials on the site, and the potential for subsurface fires in accumulations of flammable materials on the site.

- Local fire station situated less than a mile away is equipped with a single engine fire truck that could dispense water at 1500 GPM.

EMERGENCY ACTION PLAN

1. In the event of an emergency, the following shall be notified:

   A. On-site Responders:
      Peter Branda, Valley General Manager, (626) 705-6323
      Efrain Olmos, Operations Supervisor, (626) 705-6955

   B. Method of Notification to Responder:
      Automatic Alarm
      Manual Alarm
      Telephone
      Verbal

   C. Agencies

Fire Department:	911
State Office of Emergency Environmental Services:	(626) 334-5596

2. Designated Local Emergency Medical Facility:
   Occu-Med, 12134 Victory Blvd., North Hollywood, CA
   24-hour telephone (800) 801-3022

3. Mitigation Equipment:

   A. Monitoring Devices:
      - Smoke detectors

   B. Spill Containment:
      - Absorbents

   C. Spill Control and Treatment
      - Mechanical Ventilation
      - Secondary Containment

4. Evacuation:
   - Immediate area evacuation routes posted
   - Entire building evacuation procedures developed
   - Assembly areas preplanned
   - Evacuation maps posted

EMERGENCY RESPONSE TRAINING PLAN

1. Person responsible for the emergency-response training plan:

   Peter Branda, Valley General Manager, (626) 705-6323
   Efrain Olmos, Operations Supervisor, (626) 705-6955

2. Training Requirements:

   A. All employees trained in the following as indicated:
   - Procedures for internal alarm/notification
   - Procedures for notification of external emergency-response organization
   - Location and content ofthe emergency-response plan

   B. Chemical handlers are trained in the following as indicated:
   - Safe method for handling and storage of hazardous materials
   - Proper use of personal protective equipment.
   - Locations and proper use of fire- and spill-control equipment
   - Specific hazards of each chemical to which they may be exposed

   C. Emergency-response team members are trained in the following:
   - Procedures for shutdown of operations
   - Procedures for using, maintaining and replacing facility emergency and monitoring equipment

3. The following records are maintained for all employees:
   - Verification that training was completed by the employee
   - Description of the type and amount of introductory and continuing training
   - Documentation on and description emergency-response drills conducted at the facility

4. A more comprehensive and detailed emergency-response training plan is maintained on site.

   Location: Office of Efrain Olmos
   Responsible Person: Efrain Olmos

Appendix C Air Quality

This technical appendix contains the *Air Quality and Health Risk Assessment* (KB Environmental Sciences, Inc., RCH Group, July 2014) and the *Air Quality and Cancer Incidence Assessment of Irwindale, California* (SWAPE, January 2014).

The supporting air quality and health risk assessment files [listed below] are on-file with the City.

- Ambient Monitoring Data
- Construction and Operational Emissions
- CALEEMOD
- AERMOD with Meteorological/Terrain/Ozone Data
- CO Hotspot Intersection Analysis
- EMFAC Emission Factors
- OFFROAD Emission Factors
- Health Risk Assessment
- Local Significance Threshold Analysis

Air Quality and Health Risk Assessment

Prepared by:

KB Environmental Sciences, Inc.,
RCH Group

July 18, 2014

Air Quality Emissions

Air quality calculations were made for combustion sources such as on-road vehicles from employees and haul trucks as well as onsite combustion equipment such as loaders and excavators. Fugitive dust from grading, loading/unloading, vehicle movement on unpaved surfaces, and processing such as hoppers and conveyors was also calculated.

A.1 On-Road Vehicles

Vehicular emissions were computed using the CARB's emission factor model, EMFAC2011, to estimate on-road emissions. Employee trips were modeled using the light-duty auto classification. Paved road dust, break wear, and tire wear particulate emissions were also accounted for and included in the analysis using EMFAC2011 factors and methodologies from CARB and the USEPA.

The Proposed Project proposes a maximum throughput of up to 6,000 tons per day. The maximum daily number of truck trips would be 2,456 truck round trips (including collection trucks, transfer trucks and self-haul trucks). The daily trips include 249 self-haul trips, 1,137 packer truck trip, 66 end dump truck trips, 445 roll-off truck trips, and 559 transfer truck trips. The Proposed Project also includes 345 employee trips. An additional 751 daily trips would be associated with the convenience store/service station.

The average travel distances for the Proposed Project are estimated to be 9.1, 8.4, and 16.6 miles for the collection/roll-off trucks, self-haul trucks, and employees, respectively. Employee trips are a composite of gasoline and diesel vehicles.

Vehicular emissions were computed using the CARB's emission factor model, EMFAC2011[1], to estimate on-road emissions. Transfer trucks, roll-off trucks, packer trucks, and end-dump trucks were modeled using the T7 Solid Waste Collection Vehicle classification, which is a worst-case heavy-heavy duty truck emission factor for solid waste collection vehicles. Self-haul trucks would have substantially smaller payload capacities and were modeled using light-heavy duty truck emission factors. Paved road dust, break wear, and tire wear particulate emissions were also accounted for and included in the analysis using EMFAC2011 factors and methodologies from CARB and the USEPA. Vehicles speeds are assumed to be 30 miles per hour. Idling emissions were calculated using idling emission factors from the EMFAC2011 model and idle limits of five minutes.

Criteria pollutant emissions associated with on-road vehicles were calculated by combining the activity information with emissions factors, in grams per mile and grams

[1] CARB EMFAC2007 Emissions Model, http://www.arb.ca.gov/msei/onroad/latest_version.htm.

per idle hour, derived using the EMFAC2011. Emissions calculations were based on **Equation 1**. The EMFAC2011 emissions factors are summarized on **Tables AQ-1 through AQ-4** for employee vehicles, haul trucks, and truck idling. EMFAC2011 estimates emission factors through 2035. Project activities beyond 2035 assumed the same emission factors as 2035. Significant decreases in emissions occur from 2015 through 2035 due to regulatory requirements.

Equation 1

*Emission Rate (tons/year) = EMFAC Emission Factor (gram/mile) * trips per day * miles per trip * days/year * (453.59/2000 tons/gram)*

*Emission Rate (tons/year) = EMFAC Emission Factor (gram/hour) * total idle hours * (453.59/2000 tons/gram)*

Table AQ-1 – Emissions Factors (g/mile) for Employee Vehicles, by Year

Year	ROG	CO	NOx	CO2	PM10	PM2.5
2015	0.04	1.31	0.11	359	0.002	0.002
2020	0.02	0.85	0.07	360	0.002	0.002
2025	0.01	0.72	0.06	360	0.002	0.002
2030	0.01	0.67	0.06	360	0.002	0.002
2035	0.01	0.65	0.06	360	0.002	0.002

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with diameter equal to or less than 2.5 microns; ROG = reactive organic gas; CO_2 = carbon dioxide

Table AQ-2 – Emissions Factors (g/mile) for Transfer Trucks, by Year

Year	ROG	CO	NOx	CO2	PM10	PM2.5
2015	0.33	1.34	7.65	1,887	0.09	0.09
2020	0.30	1.12	4.88	1,875	0.06	0.06
2025	0.27	0.98	2.67	1,856	0.06	0.06
2030	0.25	0.92	2.47	1,855	0.06	0.05
2035	0.25	0.93	2.44	1,854	0.06	0.05

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with diameter equal to or less than 2.5 microns; ROG = reactive organic gas; CO_2 = carbon dioxide

Table AQ-3 – Emissions Factors (g/mile) for Self-Haul Trucks, by Year

Year	ROG	CO	NOx	CO2	PM10	PM2.5
2015	0.19	1.68	3.23	619	0.04	0.04
2020	0.15	0.94	2.26	619	0.03	0.03
2025	0.12	0.74	1.58	619	0.03	0.03
2030	0.09	0.69	1.13	619	0.02	0.02
2035	0.08	0.67	0.88	619	0.02	0.02

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with diameter equal to or less than 2.5 microns; ROG = reactive organic gas; CO_2 = carbon dioxide

Table AQ-4 – Idle Emissions Factors (g/hour) for Transfer Trucks, by Year

Year	ROG	CO	NOx	CO2	PM10	PM2.5
2015	6.34	34.5	64.0	7,032	0.268	0.247
2020	6.74	37.9	47.2	7,043	0.117	0.107
2025	7.31	41.2	39.5	7,035	0.110	0.101
2030	7.34	41.4	39.1	7,035	0.109	0.100
2035	7.37	41.6	38.8	7,036	0.108	0.099

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with diameter equal to or less than 2.5 microns; ROG = reactive organic gas; CO_2 = carbon dioxide

A.2 Off-Road Equipment

Operation of the Proposed Project would require the use of heavy-duty equipment, such as excavators, loaders, forklifts, off-road haul trucks. This equipment would be used to load and unload material and otherwise sort and handle material. Emissions from this equipment were estimated using the same approach as construction emissions. Emission factors from the OFFROAD2011 model, as included in CalEEMod were used. Equipment load factors were adjusted using the latest information in the OFFROAD2011 model.

Parameters for off-road equipment, including equipment and fuel type, estimated horsepower and estimated annual hours of operation, were developed. Annual hours of off-road equipment operation were based on normal business hours of 12 hours per day, six days per week.

This information was applied to criteria pollutant emissions factors, in grams per horsepower-hour, primarily derived using the CARB OFFROAD2011 emissions model (i.e., the Offroad Emissions Inventory [OEI] Database). **Equation 2** outlines how off-road construction equipment emissions were computed, and the emissions factors used in this assessment are summarized, by equipment type and construction year, on **Tables AQ-5** through **AQ-9**. **Exhibit 1** provides the emission factors for Tier 1 through 4 off-

road equipment (as part of mitigation measures). OFFROAD2011 estimates emission factors through 2040. Project activities beyond 2040 assumed the same emission factors as 2040. Significant decreases in emissions occur from 2015 through 2040 due to regulatory requirements.

Equation 2

*Emission Rate (tons/year) = OFFROAD Emission Factor (gram/hp-hour) * size (hp) * hours of operation * Load Factor * (453.59/2000 tons/gram)*

Table AQ-5 – Emissions Factors (g/hp-hour) for Excavator, by Year

Year	ROG	CO	NOx	CO2	PM10	PM2.5
2015	0.384	3.17	4.48	512	0.221	0.204
2016	0.358	3.16	4.08	506	0.201	0.185
2017	0.334	3.15	3.70	499	0.182	0.168
2018	0.273	3.09	2.92	491	0.142	0.130
2019	0.246	3.08	2.53	483	0.122	0.112
2020	0.231	3.09	2.28	472	0.110	0.102
2021	0.216	3.09	2.03	472	0.099	0.091
2022	0.191	3.07	1.68	472	0.081	0.075
2023	0.178	3.08	1.46	472	0.072	0.066
2024	0.170	3.08	1.32	472	0.065	0.060
2025	0.158	3.08	1.15	472	0.057	0.052
2030	0.213	3.36	0.53	568	0.023	0.023
2035	0.197	3.36	0.37	568	0.015	0.015
2040	0.193	3.36	0.31	568	0.013	0.013

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with diameter equal to or less than 2.5 microns; ROG = reactive organic gas; CO_2 = carbon dioxide

Table AQ-6 – Emissions Factors (g/hp-hour) for Loader, by Year

Year	ROG	CO	NOx	CO2	PM10	PM2.5
2015	0.569	3.83	5.42	517	0.424	0.390
2016	0.538	3.81	5.14	511	0.396	0.364
2017	0.501	3.78	4.81	503	0.362	0.333
2018	0.420	3.69	4.15	494	0.294	0.271
2019	0.368	3.64	3.69	486	0.247	0.227
2020	0.331	3.60	3.33	475	0.210	0.194
2021	0.296	3.57	3.00	475	0.177	0.163
2022	0.260	3.54	2.65	476	0.142	0.131
2023	0.239	3.53	2.43	476	0.120	0.110
2024	0.227	3.53	2.29	477	0.105	0.097
2025	0.209	3.52	2.11	477	0.086	0.079
2030	0.272	3.71	1.62	568	0.030	0.030
2035	0.258	3.70	1.52	568	0.020	0.020
2040	0.254	3.70	1.49	568	0.016	0.016

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with diameter equal to or less than 2.5 microns; ROG = reactive organic gas; CO_2 = carbon dioxide

Table AQ-7 – Emissions Factors (g/hp-hour) for Skid Steer, by Year

Year	ROG	CO	NOx	CO2	PM10	PM2.5
2015	0.664	4.02	4.54	577	0.286	0.263
2016	0.639	4.00	4.44	571	0.267	0.246
2017	0.599	3.96	4.27	565	0.241	0.221
2018	0.568	3.92	4.11	557	0.218	0.200
2019	0.487	3.79	3.89	548	0.178	0.164
2020	0.446	3.74	3.75	539	0.154	0.141
2021	0.439	3.76	3.69	528	0.145	0.133
2022	0.409	3.73	3.57	527	0.126	0.116
2023	0.365	3.66	3.43	527	0.103	0.095
2024	0.353	3.65	3.37	527	0.093	0.086
2025	0.350	3.67	3.35	528	0.089	0.082
2030	0.341	3.66	3.31	528	0.084	0.077
2035	0.411	4.39	3.13	568	0.018	0.018
2040	0.411	4.39	3.10	568	0.015	0.015

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with diameter equal to or less than 2.5 microns; ROG = reactive organic gas; CO_2 = carbon dioxide

Table AQ-8 – Emissions Factors (g/hp-hour) for Sweeper, by Year

Year	ROG	CO	NOx	CO2	PM10	PM2.5
2015	0.833	4.10	6.89	514	0.610	0.561
2016	0.783	4.06	6.45	508	0.571	0.525
2017	0.721	4.01	6.02	500	0.520	0.479
2018	0.600	3.88	5.14	493	0.428	0.394
2019	0.550	3.85	4.77	485	0.387	0.356
2020	0.520	3.83	4.48	474	0.360	0.331
2021	0.440	3.76	3.96	474	0.291	0.268
2022	0.372	3.69	3.47	474	0.232	0.214
2023	0.351	3.69	3.29	474	0.210	0.193
2024	0.332	3.69	3.10	474	0.189	0.173
2025	0.303	3.66	2.82	474	0.160	0.147
2030	0.261	3.70	1.57	568	0.023	0.023
2035	0.253	3.70	1.49	568	0.016	0.016
2040	0.251	3.70	1.47	568	0.015	0.015

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with diameter equal to or less than 2.5 microns; ROG = reactive organic gas; CO_2 = carbon dioxide

Table AQ-9 – Emissions Factors (g/hp-hour) for Off-Highway Trucks, by Year

Year	ROG	CO	NOx	CO2	PM10	PM2.5
2015	0.385	2.04	4.53	516	0.17	0.16
2020	0.246	1.41	2.35	475	0.09	0.08
2021	0.225	1.34	1.95	475	0.07	0.07
2022	0.196	1.25	1.49	475	0.05	0.05
2023	0.187	1.22	1.32	475	0.05	0.04
2024	0.185	1.21	1.24	475	0.04	0.04
2025	0.177	1.18	1.06	475	0.04	0.04
2030	0.216	1.10	0.46	568	0.02	0.02
2035	0.208	1.11	0.35	568	0.01	0.01
2040	0.204	1.11	0.31	568	0.01	0.01

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter with diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with diameter equal to or less than 2.5 microns; ROG = reactive organic gas; CO_2 = carbon

Exhibit 1 – Emissions Factors (g/hp-hr) for Tiered Off-road Equipment

Emission Factors (NOx) for Off-Road Diesel Engines by Model Year and Horsepower Group (g/bhp-hr)								
Engine Model Year	Horsepower Group							
	25-49	50-74	75-99	100-174	175-299	300-599	600-750	Over 750
1900 – 1969	7.2	14.8	14.8	15.9	15.9	15.2	15.2	15.2
1970 – 1971	7.2	14.8	14.8	14.8	14.8	14.1	14.1	14.1
1972 – 1979	7.2	14.8	14.8	13.6	13.6	13.0	13.0	13.0
1980 – 1987	7.2	14.8	14.8	12.5	12.5	11.9	11.9	11.9
1988	7.1	9.9	9.9	9.3	9.3	8.9	8.9	8.9
1989 – 1995	7.1	9.9	9.9	9.3	9.3	8.9	8.9	8.9
1996	7.1	9.9	9.9	9.3	6.9	6.9	6.9	8.9
1997	7.1	9.9	9.9	6.9	6.9	6.9	6.9	8.9
1998	7.1	6.9	6.9	6.9	6.9	6.9	6.9	8.9
1999	6.2	6.9	6.9	6.9	6.9	6.9	6.9	8.9
2000	6.2	6.9	6.9	6.9	6.9	6.9	6.9	6.9
2001	6.2	6.9	6.9	6.9	6.9	4.2	6.9	6.9
2002	6.2	6.9	6.9	6.9	6.9	4.2	4.2	6.9
2003	6.2	6.9	6.9	4.3	4.3	4.2	4.2	6.9
2004	4.9	4.9	4.9	4.3	4.3	4.2	4.2	6.9
2005	4.9	4.9	4.9	4.3	4.3	4.2	4.2	6.9
2006	4.9	4.9	4.9	4.3	2.6	2.6	2.6	4.2
2007	4.9	4.9	4.9	2.6	2.6	2.6	2.6	4.2
2008	4.9	3.0	3.0	2.6	2.6	2.6	2.6	4.2
2009	4.9	3.0	3.0	2.6	2.6	2.6	2.6	4.2
2010	4.9	3.0	3.0	2.6	2.6	2.6	2.6	4.2
2011	4.9	3.0	3.0	2.6	1.5	1.5	1.5	2.6
2012	4.9	3.0	2.5	2.5	1.5	1.5	1.5	2.6
2013	3.0	3.0	2.5	2.5	1.5	1.5	1.5	2.6
2014	3.0	3.0	2.5	2.5	0.3	0.3	0.3	2.6
2015 and later	3.0	3.0	0.3	0.3	0.3	0.3	0.3	2.6

Tier 0 Engine*	
Tier 1 Engine	
Tier 2 Engine	

Tier 3 Engine	
Interim Tier 4	
Tier 4 Engine	

Health Risk Assessment

A health risk assessment (HRA) is accomplished in four steps; hazards identification, exposure assessment, toxicity assessment, and risk characterization. These steps cover the estimation of air emissions, the estimation of the air concentrations resulting from a dispersion analysis, the incorporation of the toxicity of the pollutants emitted, and the characterization of the risk based on exposure parameters such as breathing rate, age adjustment factors, and exposure duration; each depending on receptor type.

The HRA was conducted in accordance with technical guidelines developed by federal, state, and regional agencies, including US Environmental Protection Agency (USEPA), California Environmental Protection Agency (CalEPA), California Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance*[2] and the South Coast Air Quality Management District (SCAQMD) *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act.*[3]

According to CalEPA, a HRA should not be interpreted as the expected rates of cancer or other potential human health effects, but rather as estimates of potential risk or likelihood of adverse effects based on current knowledge, under a number of highly conservative assumptions and the best assessment tools currently available.

Terms and Definitions

As the practice of conducting a HRA is particularly complex and involves concepts that are not altogether familiar to most people, several terms and definitions are provided that are considered essential to the understanding of the approach, methodology and results:

Acute effect – a health effect (non-cancer) produced within a short period of time (few minutes to several days) following an exposure to toxic air contaminants (TAC).

Cancer risk – the probability of an individual contracting cancer from a lifetime (i.e., 70 year) exposure to TAC in the ambient air.

Chronic effect – a health effect (non-cancer) produced from a continuous exposure occurring over an extended period of time (weeks, months, years).

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[2] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment*, August 2003, http://oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf

[3] South Coast Air Quality Management District, Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act, *June 2011, http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588_guidelines.pdf?sfvrsn=0*

Hazard Index (HI) – the unitless ratio of an exposure level over the acceptable reference dose (RfC). The HI can be applied to multiple compounds in an additive manner.

Hazard Quotient (HQ) – the unitless ratio of an exposure level over the acceptable reference dose (RfC). The HQ is applied to individual compounds.

Toxic air contaminants (TAC) – any air pollutant that is capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). The current California list of TAC lists approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Human Health Effects - comprise disorders such as eye watering, respiratory or heart ailments, and other (i.e., non-cancer) related diseases.

Health Risk Assessment (HRA) – an analysis designed to predict the generation and dispersion of TAC in the outdoor environment, evaluate the potential for exposure of human populations, and to assess and quantify both the individual and population-wide health risks associated with those levels of exposure.

Incremental – under CEQA, the net difference (or change) in conditions or impacts when comparing the baseline to future year project conditions.

Maximum exposed individual (MEI) – an individual assumed to be located at the point where the highest concentrations of TAC, and therefore, health risks are predicted to occur.

Non-cancer risks – health risks such as eye watering, respiratory or heart ailments, and other non-cancer related diseases.

Receptors – the locations where potential health impacts or risks are predicted (schools, residences and work-sites).

Limitations and Uncertainties

There are a number of important limitations and uncertainties commonly associated with a HRA due to the wide variability of human exposures to TACs, the extended timeframes over which the exposures are evaluated and the inability to verify the results. Among these challenges are the following:

- The HRA exposure estimates do not take into account that people do not usually reside at the same location for 70 years and that other exposures (i.e., school children) are also of much shorter durations than was assumed in this analysis. Therefore, the results of the HRA are highly overstated for those cases.

- Other limitations and uncertainties associated with HRA and identified by the CalEPA include: (a.) lack of reliable monitoring data; (b.) extrapolation of toxicity data in animals to humans; (c.) estimation errors in calculating TACs emissions; (d.) concentration prediction errors with dispersion models; and (e.) the variability in lifestyles, fitness and other confounding factors of the human population.

Significance Threshold

The operation of any project with the potential to expose sensitive receptors to substantial levels of TACs (such as DPM) would be deemed to have a potentially significant impact. TACs are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). The current California list of TACs includes approximately 200 compounds, including particulate emissions from diesel-fueled engines. More specifically, proposed projects that have the potential to expose the public to TACs in excess of the following thresholds would be considered to have a significant air quality impact:

- Probability of contracting cancer for the Maximally Exposed Individual exceeds 10 in one million people for 70 year exposure.

- Ground-level concentrations of non-carcinogenic TACs exceed the acceptable health based concentrations.

These standards are typically applied to the results of a HRA based on an air dispersion modeling effort. These criteria apply only to the direct impacts of a project and not to cumulative impacts.

Hazards Identification

Emissions of DPM associated with the proposed project would occur from the following project activities:

- Truck traffic on local streets, arterials, and freeways in transit to or from the facilities,

- Truck idling and movement on-site, and

- Equipment operating on-site.

DPM emissions would be generated by facility trucks along haul routes (and idling at the facility) during the lifetime of the project.

Secondly, the applicant is proposing to include a six pump vehicle fueling facility. Fuel (gasoline) dispensing operations would result in reactive organic gas (ROG) emissions

which include TACs such as benzene, 1,3-butadiene, and formaldehyde (although the 16 air toxics contained with gasoline fuel were included in the analysis). These ROG emissions would result from four activities; loading and breathing losses (both related to the underground storage tanks), as well as refueling and spillage (both related to the fuel pumps). The following are additional details concerning these emission points:

- Loading emissions occur when a cargo tank truck unloads gasoline to the storage tanks at the gasoline station. Storage tank vapors are emitted from the vent pipe during the initial fuel transfer period. These emissions are significantly reduced when the vent pipe includes a pressure/vacuum valve.

- Gasoline vapors are emitted from the storage tank vent pipe due to temperature and pressure changes within the storage tank vapor space.

- During the refueling process, gasoline vapors are emitted at the vehicle/nozzle interface.

- Spillage emissions occur from the spills during vehicle fueling.

Diesel Particulate Matter (DPM)

Diesel exhaust is a complex mixture of thousands of individual gaseous and particulate compounds emitted from diesel-fueled combustion engines. DPM is formed primarily through the incomplete combustion of diesel fuel. Particulate matter in diesel exhaust can be emitted from on- and off-road vehicles, stationary area sources, and stationary point sources. DPM is removed from the atmosphere through physical processes including atmospheric fall-out and washout by rain. Humans can be exposed to airborne DPM or via deposition on water, soil, and vegetation. Acute inhalation exposure to elevated DPM has shown increased symptoms of irritation, cough, phlegm, chronic bronchitis, and inhibited pulmonary function. The USEPA has concluded that DPM is likely to be carcinogenic to humans by inhalation.

Diesel particulates, as defined by most emission standards, are sampled from diluted and cooled exhaust gases. This definition includes both solids and liquid material that condenses during the dilution process. The basic fractions of DPM are elemental carbon; heavy hydrocarbons derived from the fuel and lubricating oil and hydrated sulfuric acid derived from the fuel sulfur. DPM contains a large portion of the polycyclic aromatic hydrocarbons (PAH) found in diesel exhaust. Diesel particulates include small nuclei particles of diameters below 0.04 micrometers (μm) and their agglomerates of diameters up to 1 μm. Ambient exposures to diesel particulates in California are significant fractions of total TAC levels in the State.

In August 1998, the California Air Resource Board (CARB) identified diesel PM as a TAC. The CARB developed *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel- Fueled Engines and Vehicles and Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* and approved these documents on September 28, 2000.[4] The documents represent proposals to reduce DPM emissions, with the goal of reducing emissions and the associated health risk by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed DPM filters and ultra-low-sulfur diesel fuel.

In December 2000, the USEPA promulgated regulations requiring that the sulfur content in motor vehicle diesel fuel be reduced to less than 15 ppm by June 1, 2006. Control of DPM emissions focuses on two strategies, reducing the amount of sulfur in diesel fuel and developing filters for operating diesel engines to reduce the amount of particulate matter that is emitted. The USEPA has also finalized a comprehensive national emissions control program which regulates highway heavy-duty vehicles and diesel fuel as a single system. The USEPA established new emission standards that would significantly reduce PM and NO_x from highway heavy-duty vehicles.

In 2001, CARB assessed the state-wide health risks from exposure to diesel exhaust and to other toxic air contaminants. It is difficult to distinguish the health risks of diesel emissions from those of other air toxics because diesel exhaust contains approximately 40 different TACs. The CARB study detected diesel exhaust by using ambient air carbon soot measurements as a surrogate for diesel emissions. The study reported that in 2000, the state-wide cancer risk from exposure to diesel exhaust was about 540 per million population as compared to a total risk for exposure to all ambient air toxics of 760 per million. This estimate, which accounts for about 70 percent of the total risk from TACs, included both urban and rural areas in the state. It can be considered as an average worst-case for the state, since it assumes constant exposure to outdoor concentrations of diesel exhaust and does not account for expected lower concentrations indoors, where most of time is spent.

The CARB's Findings of the Scientific Review Panel on The Report on Diesel Exhaust (http://www.arb.ca.gov/toxics/dieseltac/de-fnds.htm) states that approximately 94 percent of the mass of diesel particles are less than 2.5 microns in diameter ($PM_{2.5}$). Thus, the $PM_{2.5}$ exhaust emissions were represented as DPM.

Acetaldehyde

[4] California Air Resources Board. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* October 2000. http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf

Acetaldehyde is a colorless, volatile liquid with a characteristic pungent, fruity odor. Acetaldehyde is used primarily as a chemical intermediate in the production of acetic acid, as well as a synthetic flavoring agent. Acetaldehyde is released to the environment in vehicle exhaust and as a product of open burning of gas, fuel oil, and coal. Acute exposure to acetaldehyde can cause eye, nose, and throat irritation and subsequent inflammation of the eyes and coughing. This pollutant can also cause central nervous system depression, delayed pulmonary edema, and moderate unconsciousness. Chronic dermal exposure can lead to skin burns and dermatitis. Carcinogenicity studies in rats have shown that acetaldehyde causes respiratory tract tumors. The USEPA has classified acetaldehyde as a "probable" human carcinogen.

Acrolein

Acrolein is a clear or yellow liquid with a disagreeable odor. Acrolein is used as an intermediate in the production of acrylic acid, as well as a pesticide to control algae, weeds, bacteria, and mollusks. Small amounts of acrolein can be formed and emitted into the air when trees, tobacco, other plants, gasoline, and oil are burned. Acrolein may also be released in to the environment in emissions and effluents from its manufacturing and use facilities and in emissions from combustion processes. Exposure to high concentrations of acrolein may damage the lungs and could cause death. Breathing lower amounts may cause eye watering and burning of the nose and throat and a decreased breathing rate. The USEPA has classified acrolein as "not classifiable" as to human carcinogenicity.

Benzene

Benzene is a volatile, colorless, flammable liquid that has a sweet odor. It is a chemical intermediate in the synthesis of compounds such as plastics, resins, nylon, synthetic fibers, synthetic rubbers, lubricants, dyes, detergents, drugs, and pesticides. Major sources of atmospheric releases include vehicle exhaust emissions, evaporative gasoline fumes, emissions from vehicle service stations and industrial emissions. Other potential sources of atmospheric benzene include cigarette smoke and landfill emissions. High levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, etc. Again, none of these conditions are typically found in the outdoor environment. The USEPA has classified benzene as a "known" human carcinogen.

1,3-butadiene

1,3-butadiene is a colorless gas. At room temperature, the gas has a gasoline-like odor. This pollutant is a byproduct of petroleum processing and is used in the production of synthetic rubber and plastics. It is also found in gasoline vapor, automobile exhaust, other fossil fuel combustion products and cigarette smoke. Inhalation is the primary pathway for humans. Breathing very high levels of 1,3-butadiene for a short time may cause central nervous system damage, blurred vision, nausea, fatigue, headache, decreased blood pressure and pulse rate, and unconsciousness. Breathing lower levels of this pollutant may cause irritation of the eyes, nose, and throat. However, neither of these conditions are typically found in the outdoor environment. The USEPA has classified 1,3-butadiene as a "known" human carcinogen.

Formaldehyde

At room temperature, formaldehyde is a colorless, flammable gas that has a distinct, pungent smell. Formaldehyde is a product of incomplete combustion and is emitted into the air by burning wood, coal, kerosene, and natural gas, by automobiles and by cigarettes; it is also a naturally occurring substance. Formaldehyde can be released to soil, water, and air by industrial sources and can off-gas from materials made with it. Humans can be exposed to formaldehyde through inhalation of contaminated air and smog. Low levels of formaldehyde can cause irritation of the eyes, nose, throat, and skin. Some epidemiological studies found an increased incidence of nose and throat cancer in exposed individuals, whereas other studies could not confirm this finding. The USEPA has classified formaldehyde as a "probable" human carcinogen.

Toluene

Toluene is a colorless, clear liquid that occurs naturally in crude oil. It is also produced in the process of manufacturing gasoline and other fuels from crude oil. Airport-related sources of toluene include aircraft, ground support equipment, motor vehicles, heating plants, and gasoline fuel storage tanks. Low to moderate levels of toluene can affect the nervous system and cause tiredness, confusion, weakness, memory loss, nausea, loss of appetite, and hearing and color vision loss. Inhaling high levels of toluene in a short time can make a person feel light-headed, dizzy, or sleepy, and can cause unconsciousness and death. The USEPA has assigned toluene as "not classifiable" as to human carcinogenicity.

Scenario 6B of the California Air Pollution Control Officers Association (CAPCOA) *Air Toxics "Hot Spots" Program Gasoline Service Station Industry-wide Risk Assessment*

Guidelines[5] was used to estimate TACs emissions that would result from the proposed gasoline station. The calculations are based on maximum hourly gasoline throughout and a typical annual gasoline throughput based on maximum vehicle volume and number of fuel pumps with underground storage tanks and phase 2 vapor recovery systems, 90 percent overall control efficiency. The service station would have an estimated throughput of approximately 1.6 million gallons a year of gasoline and 0.34 million gallons of diesel.[6]

Exposure Assessment

Dispersion is the process by which atmospheric pollutants disseminate due to wind and vertical stability. The results of a dispersion analysis are used to assess pollutant concentrations at or near an emission source. This section presents the methodology used for the dispersion modeling analysis and addresses all of the fundamental components of an air dispersion modeling analysis including:

- Model selection and options
- Receptor locations
- Meteorological data
- Source release characteristics

Based on CAPCOA's *Air Toxics "Hot Spots" Program Gasoline Service Station Industry-wide Risk Assessment Guidelines* the loading and breathing emissions were treated as a volume source while refueling and spillage emissions were treated as a point source (modeling release parameters contained in Appendix D of CAPCOA's *Guidelines*).

Model Selection and Options

The AERMOD dispersion model (Version 12345) was used for the modeling analysis. AERMOD is the USEPA preferred dispersion model for general industrial purposes. The AERMOD model is the appropriate model for this analysis based on the coverage of simple, intermediate, and complex terrain. It also predicts both short-term (one to 24 hours) and long-term (annual) average concentrations. The model was executed using the regulatory default options (stack-tip downwash, buoyancy-induced dispersion, final plume rise), default wind speed profile categories, default potential temperature gradients, and no pollutant decay.

[5] California Air Pollution Control Officers Association, *Air Toxics "Hot Spots" Program Gasoline Service Station Industry-wide Risk Assessment Guidelines* November 1997, http://www.arb.ca.gov/ab2588/rrap-iwra/gasiwra.pdf

[6] California Energy Commission, Retail Fuel Report and Data for California, http://energyalmanac.ca.gov/gasoline/piira_retail_survey.html

The selection of the appropriate dispersion coefficients depends on the land use within three kilometers (km) of the project site. The land use typing was based on the classification method defined by Auer (1978); using pertinent United States Geological Survey (USGS) 1:24,000 scale (7.5 minute) topographic maps of the area. If the Auer land use types of heavy industrial, light-to-moderate industrial, commercial, and compact residential account for 50 percent or more of the total area, the *Guideline on Air Quality Models* recommends using urban dispersion coefficients; otherwise, the appropriate rural coefficients were used. Using GIS, the following criteria apply:

- If land use types I1, I2, C1, R2, and R3 account for 50 percent or more of the area, use urban dispersion coefficients; otherwise, use appropriate rural dispersion coefficients.

- If average population density is greater than 750 people/km^2, use urban dispersion coefficients; otherwise use appropriate rural dispersion coefficients.

Based on observation of the area surrounding the project site, urban dispersion coefficients were applied in the analysis. The general effect of an urban area is to create enough additional turbulence, due to the buildings and urban "heat island" effects, which enhance plume dispersion. **Exhibits 2 and 3** display the land use and population density.

Exhibit 2 – Land Use

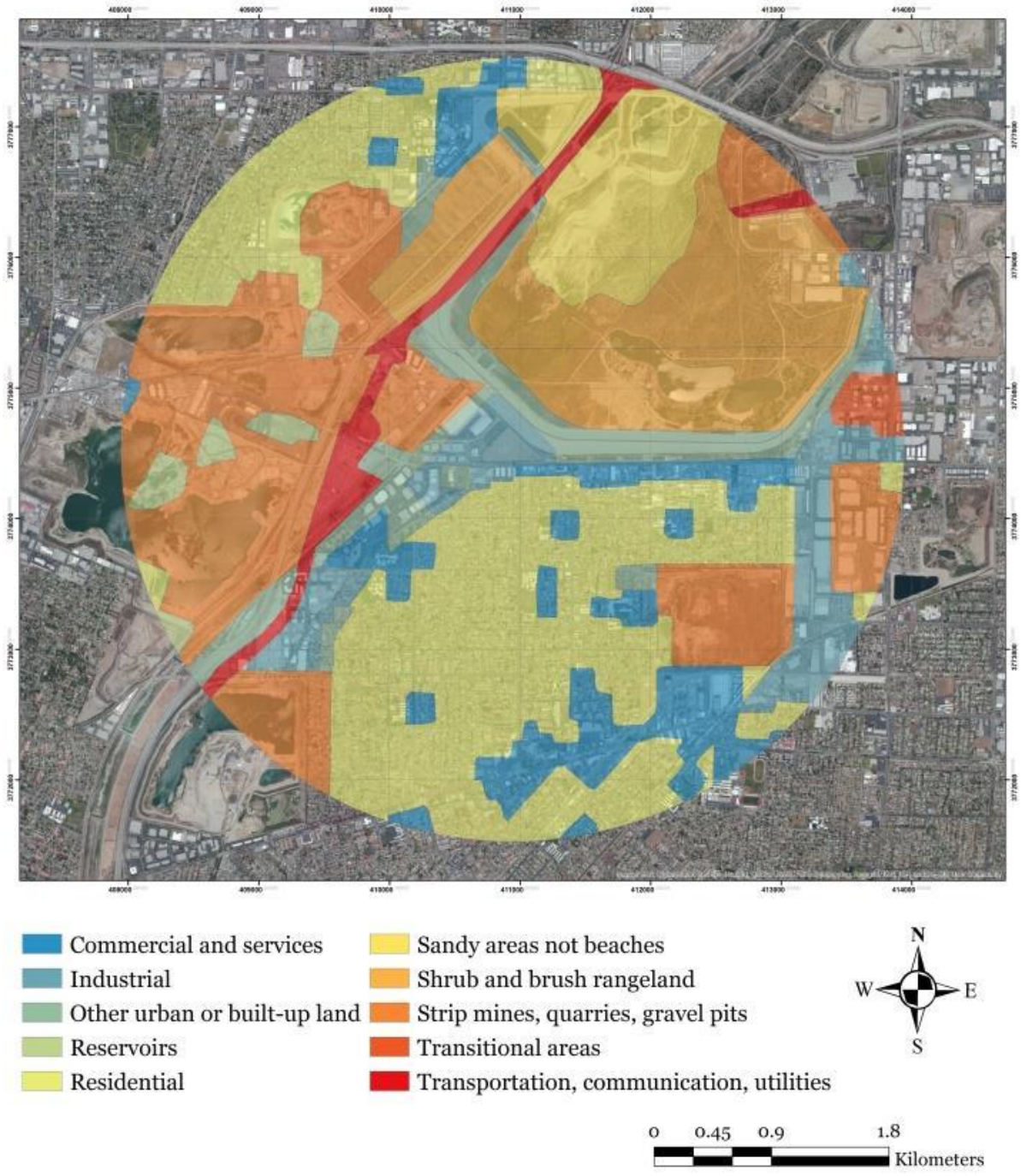
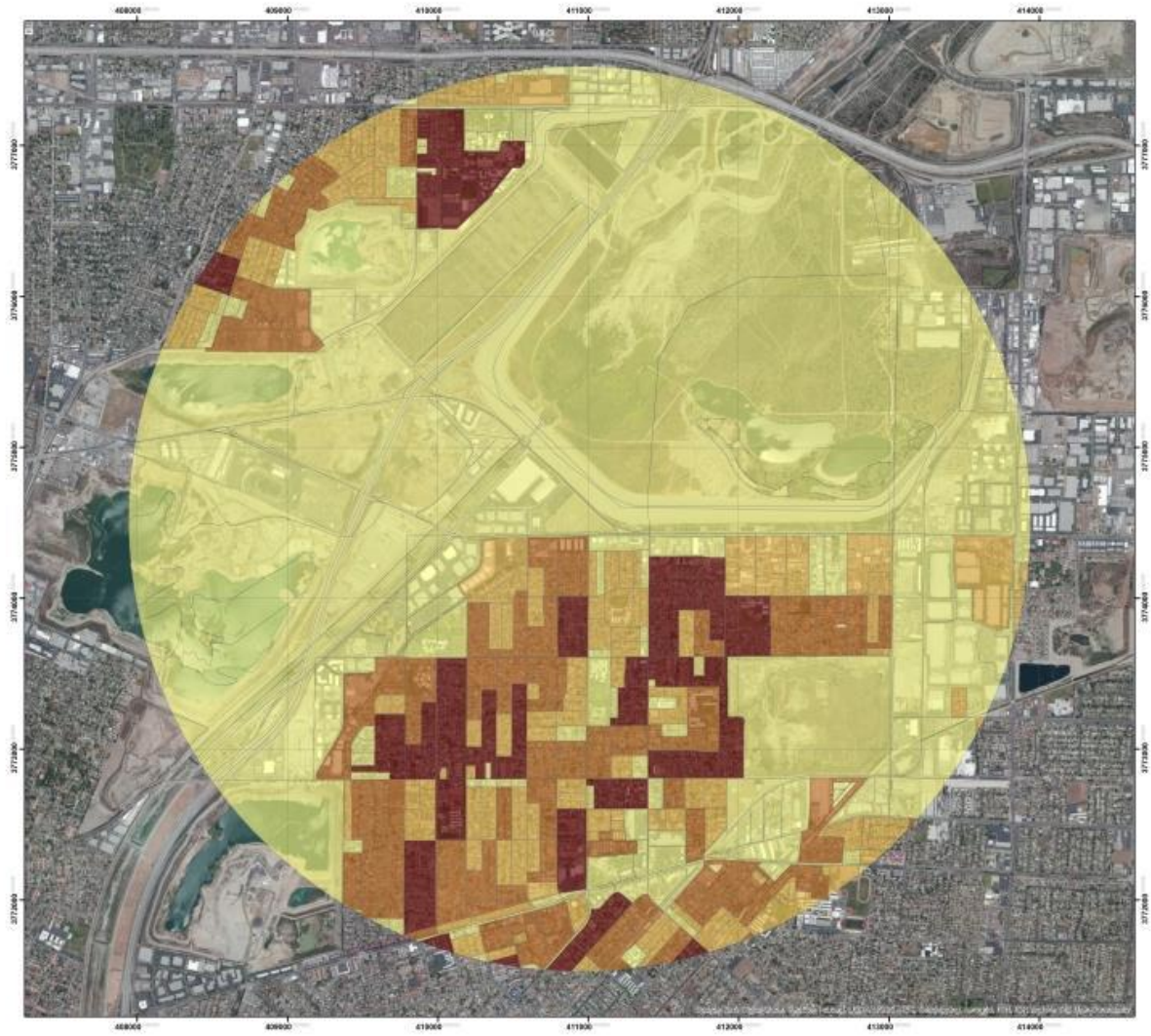


Exhibit 3 – Population Density



Total Population	Total Area (km2)	Density
53,021	28.27	1,875.32

Receptor Locations

Exhibit 4 shows receptors that include residential areas, commercial/industrial areas and sensitive receptors such schools (Margaret Heath Elementary, Pleasant View Elementary, Olive Junior High, Walnut Elementary, Santa Fe Elementary, Jerry Holland Junior High, Ernest Geddes Elementary, and North Park High School) and outdoor recreational areas near the Proposed Project. The nearest residence is located on the south side of Live Oak Avenue behind other industrial land uses in the City of Baldwin Park and approximately 325 feet from the Project. A total of 1,200 receptors were analyzed which includes a grid of receptors spaced 100 meters apart. Receptors were placed at a height of 1.8 meters (typical breathing height). Terrain elevations for receptor locations were used (i.e., complex terrain) based on available USGS information for the area.

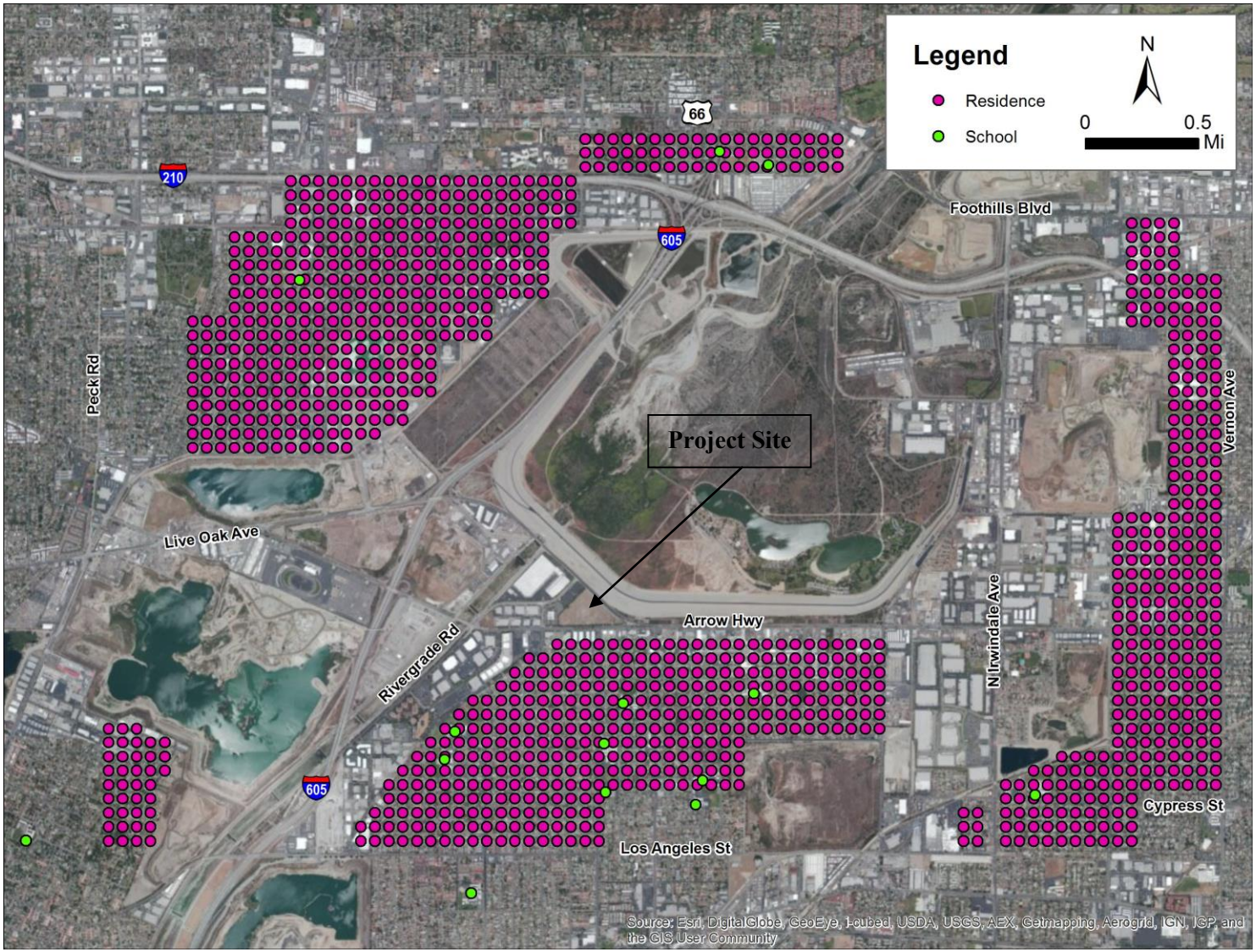
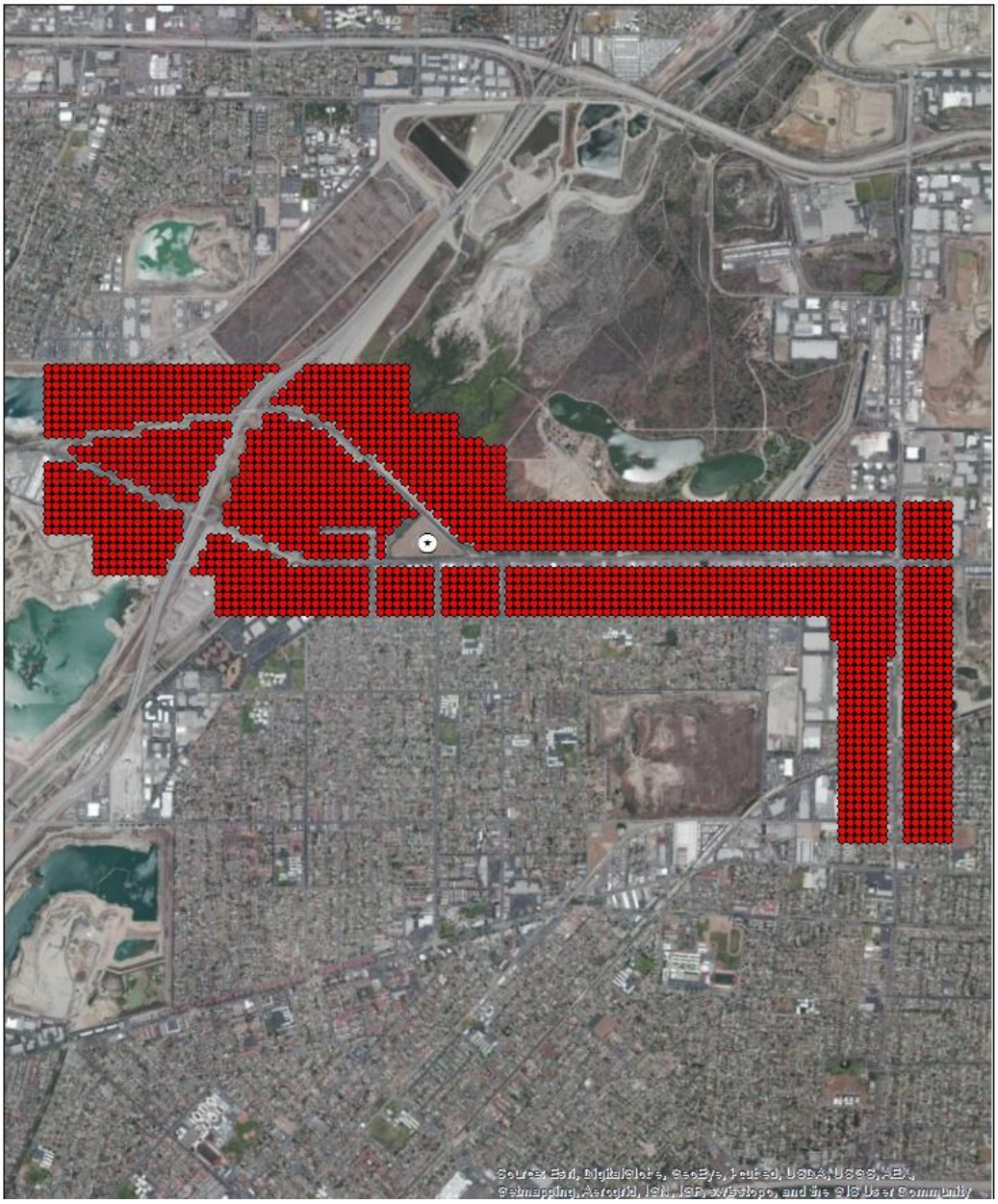


Exhibit 4 – Health Risk Assessment Receptors

Criteria pollutant impacts were evaluated at receptors where a person can be situated for an hour or longer at a time. The following receptors (see **Exhibit 5**) are included in the AERMOD model were a fine grid 25 m x 25 m located up to 500 meters from the fence line.

Exhibit 5 – Ambient Air Quality Receptors



Meteorological Data

The rate at which emissions are dispersed in the atmosphere depends upon the intensity of the ambient turbulence, the wind velocity, the position relative to obstacles in the flow field, and any dilutions attributable to the source itself.

Surface meteorological data and upper air meteorological (mixing heights) data from Azusa and Los Angeles, California, respectively, were used for the modeling analysis. Meteorological data were obtained from SCAQMD for the period 2008 through 2012. The windrose (**Exhibit 6**) indicates winds are predominantly from the west-southwest with an average wind speed of 2.00 meters per second (4.5 miles per hour).

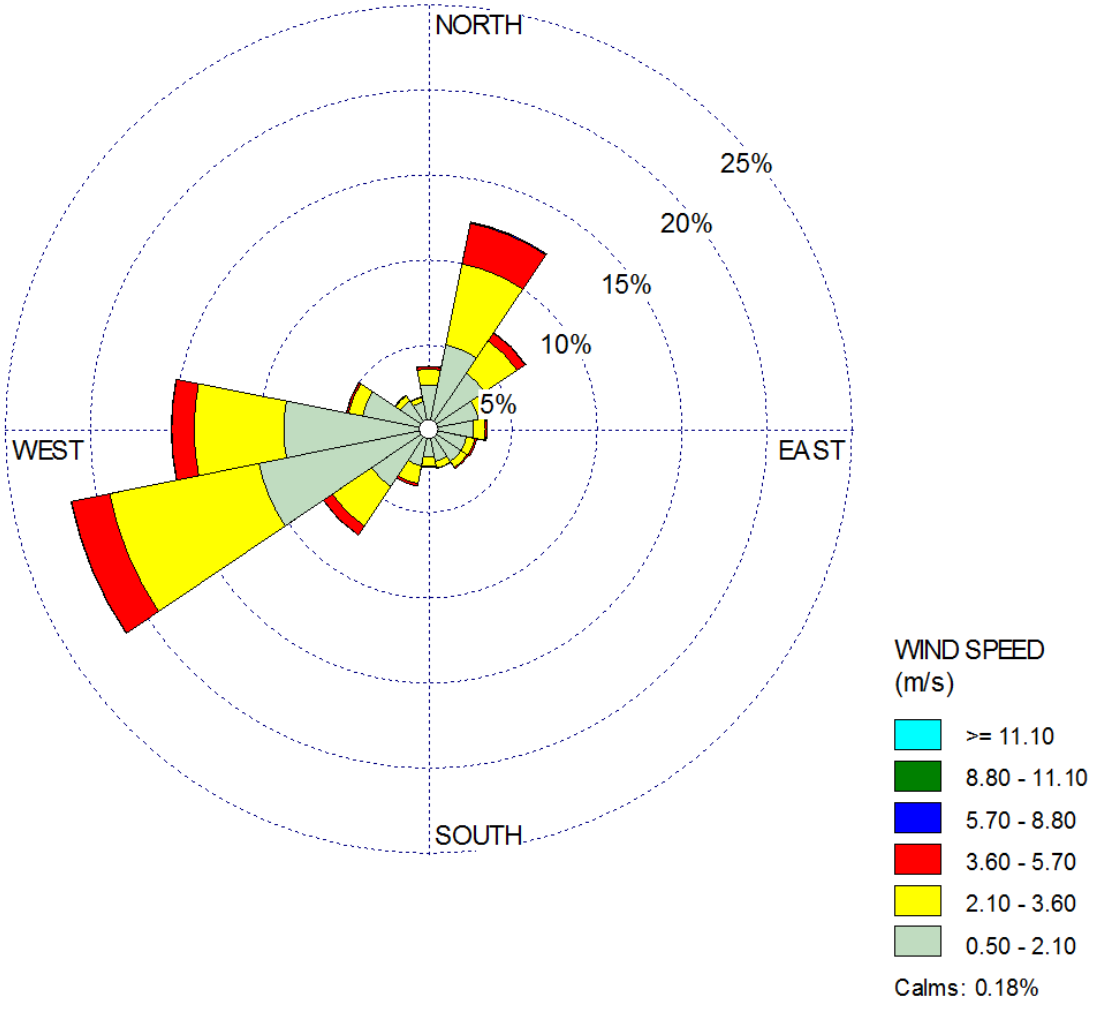


Exhibit 6 Azusa Windrose

Source Release Characteristics

Facility trucks idling at the facility prior to entering the building enclosure was treated as an area source with a release height of 4.6 meters. The facility trucks along roadways were treated as line sources along the haul routes. These sources were modeled with a release height of 4.2 meters and a vertical dimension of 8.3 meters which accounts for the turbulence of vehicle movement. Sources associated with the service station are generally surface based emissions. Terrain elevations for emission source locations were used (i.e., complex terrain) based on available USGS information for the area.

Toxicity Assessment

The toxicity values for DPM used in this analysis were based on OEHHA guidance. These toxicity values are for carcinogenic effects and chronic health impacts. The primary pathway for exposures was assumed to be inhalation and carcinogenic and non-carcinogenic effects were evaluated separately. The Cancer Potency Factor for DPM was established by the OEHHA as 1.1 mg/kg-day for 70 years. The HARP incorporates OEHHA cancer potency factors for additional air toxics included in the analysis.

The HRA was conducted following methodologies in SCAQMD *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act*[7] and in the California OEHHA *Air Toxics Hot Spots Program Guidance.*[8] This was accomplished by applying the highest estimated concentrations at the receptors analyzed to the established cancer risk estimates and acceptable reference concentrations (RfC) for non-cancer health effects.

The toxicity values used in this analysis were based on OEHHA guidance. These toxicity values are for carcinogenic effects and acute/chronic health impacts. The primary pathway for exposures was assumed to be inhalation and carcinogenic and non-carcinogenic effects were evaluated separately. The incremental risks were determined for each emission source of TAC and summed to obtain an estimated total incremental carcinogenic health risk.

Cancer risk estimates also incorporate age sensitivity factors (ASFs). This approach provides updated calculation procedures that factor in the increased susceptibility of infants and children to carcinogens as compared to adults. OEHHA recommends that cancer risks be weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, and by a factor of 3 for exposures from 2 years through 15 years of age. For estimating cancer risks

[7] South Coast Air Quality Management District. Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act. June 2011. *http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588_guidelines.pdf?sfvrsn=0*

[8] Office of Environmental Health Hazard Assessment. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment*. August 2003. http://oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf

for residential receptors over a 70 year lifetime, the incorporation of the ASFs results in a cancer risk adjustment factor (CRAF) of 1.7.

Per OEHHA guidance for cancer risk analysis, a continuous exposure of 24 hours per day, 350 days per year for a 70-year lifetime is assumed for residents. This is a highly conservative assumption, since most people do not remain at home all day and on average residents change residences every 11 to 12 years. In addition, this analysis assumes that residents are experiencing outdoor concentrations for the entire exposure period. For children at school sites, exposure is assumed to occur 10 hours per day for 180 days (or 36 weeks) per year.

For occupational receptors, SCAQMD guidance suggests that the exposure be based on 8 hours per day, 5 days per week, 245 working days per year, and a 40-year working lifetime. This is a conservative assumption, since most people do not remain at the same job for 40 years.

The SCAQMD also suggests specific daily breathing rates and exposure value factors for estimating cancer risks. The 80th percentile adult breathing rate of 302 liters per kilogram per day (L/kg-day) was used to determine cancer risks to residents from exposure to TAC. The residential exposure frequency and duration was assumed to be 350 days per year and 70 years. For children, OEHHA recommends assuming a breathing rate of 581 L/kg-day to assess potential risk via the inhalation exposure pathway. This value represents the upper 95th percentile of daily breathing rates for children. The modeled TAC concentrations were used to represent the exposure concentrations in the air. The inhalation absorption factor was assumed to be 1. Cancer risk to residential receptors based on a 70-year lifetime exposure. Cancer risk estimates for children at school sites are calculated based on 9 year exposure duration. **Table AQ-10** provides a summary of the risk assessment exposure parameters used in the analysis.

Table AQ-10: Health Risk Assessment Exposure Parameters

Receptor	Breathing Rate (DBR)	Cancer Risk Adjustment Factor (CRAF)	Daily Exposure	Annual Exposure	Exposure Duration (ED)
Worker	149	1.7	12 hours	245 days	40 year
Adult	302	1.7	24 hours	350 days	70 years
Child	581	10	24 hours	350 days	3 years
School	581	3	10 hours	180 days	9 years

Source: Office of Environmental Health Hazard Assessment (OEHHA), 2003. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, http://www.oehha.org/air/hot_spots/pdf/HRAguidefinal.pdf and South Coast Air Quality Management District, Risk Assessment Procedures for Rules 1401 and 212, July 1, 2005, http://www.aqmd.gov/prdas/risk%20assessment/riskassessment.html

Risk Characterization

The cancer risk is the probability of an individual developing cancer as a result of exposure to DPM. The cancer risks are assumed to occur exclusively through the inhalation pathway. The cancer risk based on a one-year exposure can be estimated by utilizing the cancer potency factor (mg/kg-day), the annual average concentration (µg/m^3), and the lifetime exposure adjustment.

The cancer risks from DPM occur exclusively through the inhalation pathway; therefore, the cancer risks can be estimated from the following equation:

$$Dose_{DPM} = \sum C_{DPM} \bullet DBR \bullet EF \bullet ED \bullet (10^{-6})/(AT)$$

where,

$Dose_{DPM}$	Dose through Inhalation from DPM (mg/kg-day)
C_{DPM}	Annual average DPM concentration ($\mu g/m^3$) during the 70 year exposure period
DBR	Daily Breathing Rate (L/kg-day)
EF	Exposure Frequency (days/year)
ED	Exposure Duration (years)
AT	Averaging Period over which exposure is averaged (25,550 days or 70 years)

$$\text{Cancer Risk} = Dose_{DPM}\ (mg/kg\text{-}day) \bullet \text{Cancer Potency}_{DPM}\ (kg\text{-}day/mg) \bullet (10^6)$$

The Caner Potency Factor for DPM was established by the OEHHA as 1.1 kg-day/mg. Other air toxics such as benzene and 1,3-butadiene, emitted as part of the fuel dispensing station were also included.

The Hazard Index is an expression used for the potential for non-cancer health effects. The relationship for the non-cancer health effects is given by the annual concentration ($\mu g/m^3$) and the Reference Exposure Level ($\mu g/m^3$).

The relationship for the non-cancer health effects of DPM is given by the following equation:

$$HI_{DPM} = C_{DPM}/REL_{DPM}$$

where,

HI_{DPM}	Hazard index; an expression of the potential for non-cancer health effects.
C_{DPM}	Annual average DPM concentration ($\mu g/m^3$) during the 70 year exposure period
REL_{DPM}	Reference exposure level (REL) for DPM; the DPM concentration at which no adverse health effects are anticipated.

The chronic reference exposure level for DPM was established by the OEHHA as 5 $\mu g/m^3$. Other air toxics such as benzene and 1,3-butadiene, emitted as part of the fuel dispensing station were also included.

Table AQ-11 provides the toxicity values for each of the pollutants associated with the proposed project.

Table AQ-11 Toxicity Values

Pollutant	Slope Factor (mg/kg-day)	Acute REL ($\mu g/m^3$)	Chronic REL ($\mu g/m^3$)
Diesel particulate matter	1.1		5
formaldehyde	0.021	55	9
methyl alcohol		28000	4000
Benzene	0.1	1300	60
acetaldehyde	0.01	470	140
methyl ethyl ketone		13000	
naphthalene	0.12		9
o-xylene		22000	700
isopropylbenzene			
ethylbenzene	0.0087		2000
Styrene		21000	900
1,3-butadiene	0.6		20
Acrolein		2.5	0.35
m-xylene		22000	700
Toluene		37000	300
n-hexane	0.021		7000

Source: California Office of Environmental Health Hazards Assessment Toxicity Criteria Database, 2013, http://www.oehha.ca.gov/tcdb/.

CO Intersection Analysis

The SCAQMD, CARB and USEPA identifies CO, PM_{10}, and $PM_{2.5}$ as the primary pollutants of concern when assessing potential air quality impacts from motor vehicle exhaust. Increased concentrations of CO, PM_{10}, and $PM_{2.5}$ can be expected in places where large numbers of motor vehicles (especially diesel vehicles for PM_{10} and $PM_{2.5}$) are present including crowded intersections where traffic delays are common during peak (traffic) hour periods.

For CO, intersections that are at Level-of-Service (LOS) D, E, or F or that will deteriorate to LOS D, E, or F with the Proposed Project are to be evaluated. For PM_{10} and $PM_{2.5}$, intersections that are at LOS D, E, or F with a significant number of diesel vehicles or intersections that will deteriorate to LOS D, E, or F with a significant number of diesel vehicles with the Proposed Project are to be evaluated. The SCAQMD suggests that localized CO impacts be considered at intersections that change from LOS A, B, or C to D or worse as a result of the Proposed Project and for all intersections rated D or worse where the Proposed Project increases the volume-to-capacity by two percent or more.[9]

A hot-spot analysis is typically required only for locations which are nonattainment or maintenance for CO, PM_{10}, and/or $PM_{2.5}$. The South Coast Basin portion of Los Angeles County is in nonattainment status for the federal ozone, lead, and $PM_{2.5}$; and in attainment for the federal CO, NO_2, SO_2, and PM_{10}.[10] Federal nonattainment areas are further designated as marginal,

[9] SCAQMD, Ian MacMillian (Program Supervisor – CEQA Section), February 2012.
[10] *USEPA, The Green Book Nonattainment Areas for Criteria Pollutants, http://www.epa.gov/air/oaqps/greenbk/index.html*

moderate, serious, severe, or extreme as a function of deviation from standards. The South Coast Basin portion of Los Angeles County is in nonattainment status for the State ozone, PM_{10}, and $PM_{2.5}$; and is in attainment status for CO, NO_2, SO_2, and lead.[11]

Generally, a project is not a project of PM concern unless it changes capacity or alignment of a road with more than 125,000 AADT and eight percent trucks, more than 10,000 truck AADT (i.e., eight percent of 125,000), or otherwise may substantially increase or concentrate diesel exhaust emissions (such as bus terminals and transfer points, designated truck routes, and freight intermodal terminals).[12] The nearby freeways include approximately seven percent truck traffic. Importantly, a significant number of diesel vehicles would not be associated with the Proposed Project.[13]

Therefore, an intersection hot-spot analysis is not required for CO, PM_{10}, and $PM_{2.5}$. Nevertheless, for informational purposes, a CO intersection analysis was completed. For this analysis, future No Project and Proposed Project (with and without improvements) traffic volumes at two signalized intersections were evaluated, as listed within the following:

- Live Oak Avenue & I-605 NB Off-ramps
- Maine Avenue & Live Oak Avenue

The CAL3QHC screening dispersion model was used for the CO analysis. CAL3QHC (version 04244) is an USEPA-approved micro-scale atmospheric dispersion model that combines roadway design and operational parameters, motor vehicle emission factors and meteorological conditions to predict pollution concentrations at specified receptor locations along roadways, interchanges, or intersections.[14] The dispersion modeling analysis at roadway intersections was prepared for the following scenarios: the future No Project and Proposed Project (with and without improvements) during 2016 and 2035.

Approach speeds to signalized intersections were assumed to be 20 mph in all cases to ensure conservative estimates. Traffic emissions were associated with running vehicles along the roadway and idling vehicles at the intersection based on the EMFAC2011 emissions model. For the CO analysis, the following worst-case meteorological conditions and input parameters were used:

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11 *CARB, Area Designations Maps/State and National, http://www.arb.ca.gov/desig/adm/adm.htm*

12 CalTrans, Particulate Matter Hot-spot Analysis, http://www.dot.ca.gov/hq/env/air/pages/qualpm.htm

13 The Proposed Project proposes a maximum throughput of up to 6,000 tons per day. The maximum daily number of truck trips would be 2,456 truck round trips (including collection trucks, transfer trucks and self-haul trucks). The daily trips include 249 self-haul trips, 1,137 packer truck trip, 66 end dump truck trips, 445 roll-off truck trips, and 559 transfer truck trips. The Proposed Project also includes 345 employee trips. An additional 751 daily trips would be associated with the convenience store/service station.

14 User's Guide to CAL3QHC Version 2: A Modeling Methodology for Predicting Pollutant Concentration near Roadway Intersections, November 1992.

- Stability Class: D (neutral atmosphere)
- Wind Speed: 1 meter per second (m/s)
- Wind Directions: 360° in 10° increments, then refined to 1° increments
- Mixing Height: 1,000 meters (m)
- Surface Roughness: 175 centimeters (cm)
- Saturation Flow Rate: 1,800 vehicles per hour (vehicles per hour)

CO concentrations were estimated for a 1-hour averaging period and adjusted to an 8-hour averaging period based on a persistence factor of 0.7. Receptors were placed at the nearest locations where the general public would have access, which included parking lots and trails. Receptors were located at the corners of each intersection and at distances of 25, 50, and 100 meters from the intersection corner along both the approach and departure lane for a total of approximately 30 receptors at the intersection. The receptors were also placed approximately three meters from the edge of the roadways since this is where the maximum concentrations are expected to occur and also where the public has access. Link lengths were limited to approximately 300 meters and included thru lanes, queue lanes, for the appropriate turning movements. Data such as approach volumes, signal timing cycle, and queue delay, was based on the project traffic study and the Highway Capacity Model (HCM) output.

Background concentrations representing other local sources were determined based on nearby ambient air monitoring stations data. A background concentration for CO of 3.0 and 1.7 ppm for 1-hour and 8-hour averaging periods, respectively, was used.

Tables AQ-12 and AQ-13 presents the results of the intersection air quality analysis for CO. All results include background concentrations as well as the impacts of roadway traffic. All impacts are well below the AAQS.

Table AQ-12 – CO Intersection Hotspot Results (ppm) for 2016

Intersection	Averaging Period	AAQS	2016 No Action	2016 Proposed Project without Improvements	2016 Proposed Project with Improvements
1	1-hour	20 ppm	3.3	3.3	3.4
	8-hour	9 ppm	1.6	1.6	1.7
2	1-hour	20 ppm	3.3	3.3	-
	8-hour	9 ppm	1.6	1.6	-

Source: KB Environmental Sciences, Inc., 2014.
Note: 1-hour and 8-hour results include 3.0 ppm and 1.7 ppm background concentrations, respectively; ppm = parts per million.

Table AQ-13 – CO Intersection Hotspot Results (ppm) for 2035

Intersection	Averaging Period	AAQS	2035 No Action	2035 Proposed Project without Improvements	2035 Proposed Project with Improvements
1	1-hour	20 ppm	1.8	1.8	1.8
	8-hour	9 ppm	0.9	0.9	0.9
2	1-hour	20 ppm	1.9	1.9	-
	8-hour	9 ppm	0.9	0.9	-

Source: KB Environmental Sciences, Inc., 2014.
Note: 1-hour and 8-hour results include 3.0 ppm and 1.7 ppm background concentrations, respectively; ppm = parts per million.

Supporting Air Quality and Health Risk Assessment Files

Ambient Monitoring Data

Construction and Operational Emissions

CALEEMOD

AERMOD with Meteorological/Terrain/Ozone Data

CO Hotspot Intersection Analysis

EMFAC Emission Factors

OFFROAD Emission Factors

Health Risk Assessment

Local Significance Threshold Analysis

AIR QUALITY AND CANCER INCIDENCE ASSESSMENT OF IRWINDALE, CALIFORNIA

Prepared for:

The City of Irwindale
5050 N. Irwindale Ave
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January 2014

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

EXECUTIVE SUMMARY

Soil Water Air Protection Enterprise (SWAPE), in collaboration with the Cancer Surveillance Program, found that the Irwindale area has no significant excess of breast, prostate, colon, and lung/oropharyngeal cancers relative to neighboring census tracts, Los Angeles County, and California. In fact, Irwindale was found to have lower cancer incidence than surrounding census tracts, Los Angeles County, and California.

Since its founding in 1860, the City of Irwindale has remained a small, close-knit community of about 1,500 residents. The City is roughly 9.5 square miles, with approximately one percent dedicated to residential use, about 46% to industry and business, and the remainder consisting of open space, roads and railroads, government buildings, and vacant space. Despite its small residential population, approximately 40,000 people are employed by businesses residing within Irwindale's borders. Irwindale has long been home to mining and rock operations, and is bounded by the 605 Highway to the West, the 210 to the North, and the 10 Freeway to the south. Winds typically blow to the north and west.

According to the California Cancer Registry (CCR), a cancer cluster is an excess of cases of a particular cancer that has been determined to be unusual when compared to expected cancer incidence patterns. In this analysis, annual age-adjusted incidence rates are used to evaluate whether an excess exists. Annual age-adjusted incidence rates are the number of new cancer cases diagnosed each year per 100,000 people, with different age groups noted for more realistic comparisons between populations. A cancer cluster is characterized by how the excess occurs, whether within a certain group of people, location, or time period. To transition from a suspected cancer cluster to a confirmed cluster, the perceived excess must be labeled as statistically significant (not due to chance alone) by public health officials. SWAPE collaborated with the University of California Cancer Surveillance Program (USC CSP) to explore differences in cancer incidence and risk factors between Irwindale and its surroundings.

The Cancer Surveillance Program manages a database of all cancer diagnoses, recorded by the patient's residential address within Los Angeles County, and reports these data to the California Cancer Registry. In addition to total cancer cases, four common cancers were evaluated from 2001 through 2010: breast, colon, lung and oropharyngeal, and prostate. Other cancers could not be evaluated for confidentiality reasons, because they occurred in such low numbers. Annual

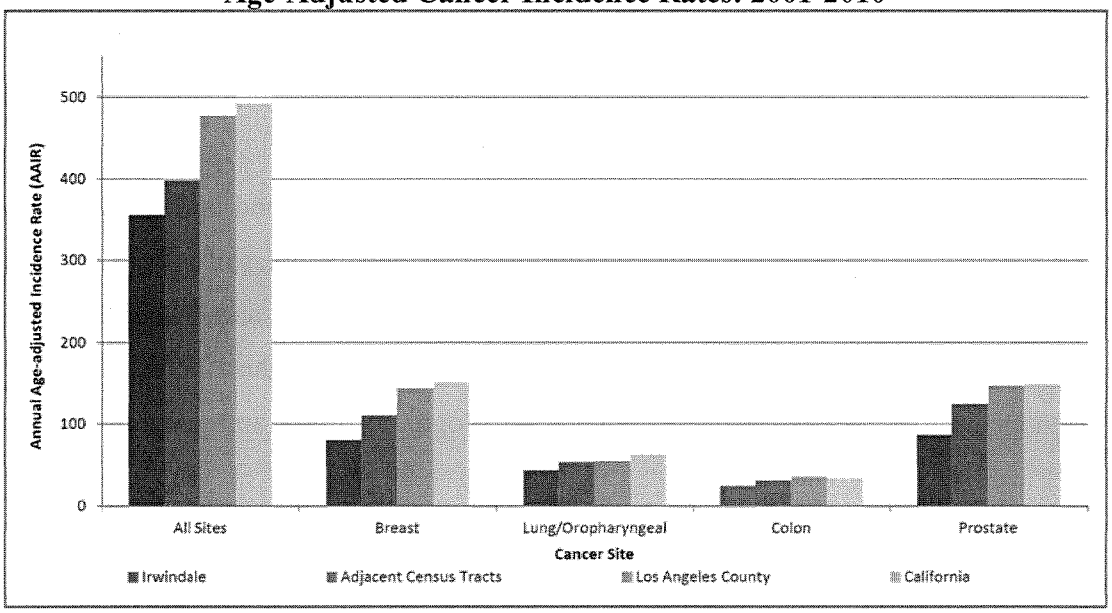
age-adjusted incidence rates were calculated for Irwindale, bordering census tracts, Los Angeles County, and California. Irwindale's rates were then evaluated against the rates of the other three regions (**Table 1**).

Table 1: Comparison of Irwindale Cancer Incidence Rates vs. Neighboring Communities, Los Angeles County, and California: 2001 – 2010

Site	Surrounding Census Tracts	Los Angeles County	California
All Cancers	0.89:1	0.74:1	0.72:1
Breast	0.73:1	0.55:1	0.53:1
Lung/ Oropharyngeal	0.81:1	0.80:1	0.70:1
Colon	0.79:1	0.69:1	0.72:1
Prostate	0.70:1	0.59:1	0.58:1

As shown in **Figure 1**, Irwindale's rates were less than the other regions for all four cancers. The Cancer Surveillance Program concluded that the City does not possess an unusually high or low incidence rate for all cancers.

Figure 1: Irwindale, Adjacent Census Tracts, Los Angeles County, and California Annual Age-Adjusted Cancer Incidence Rates: 2001-2010



SWAPE gathered and evaluated available air monitor and facility emissions data from South Coast Air Quality Management District (SCAQMD) and US EPA to investigate whether Irwindale is exposed to significant pollution relative to its surroundings. Facility and regional monitoring data show no significant causes for concern. SCAQMD air monitors measure levels

of air pollution, which are then used to calculate an Air Quality Index score, to give the public an idea of the air quality in that region. San Gabriel Valley 2001–2012 Air Quality Index values obtained from SCAQMD were labeled as 'Unhealthy' less than three percent of the time. The EPA Toxic Release Inventory (TRI) is a database of annual emissions reported by facilities nationwide. 2012 emissions data for Los Angeles County industries show that the highest emitting facility in Irwindale ranked 68th on the county-wide list, and no other sites were in the top 100 emitters. The largest source on the list was more than 500 times greater than the Irwindale facility. In addition, it is difficult to quantify individual contributions to air quality, as Irwindale is surrounded by businesses in neighboring towns, busy freeways, and accumulation of smog from the rest of the Los Angeles Basin due to prevailing winds. SWAPE also reviewed scientific reports examining common risk factors for four cancers in this analysis. While environmental pollutants can play a role in cancer incidence, the extent to which pollution contributes to cancer risk can vary between individuals and scientific reports. A large amount of literature cites lifestyle and behavioral factors such as diet, exercise, tobacco use, alcohol consumption, and occupation as having more significant impacts upon these four cancers, compared to environmental pollution. Available literature and data, along with the City's low incidence rates relative to its surroundings, indicate that Irwindale residents are not at an elevated risk of developing cancer due to environmental pollution.

SWAPE recommends a proactive approach to maintain citizen health and industry compliance. Cancer risk can be significantly minimized by increasing public awareness of preventative health measures such as making changes to diet, exercise, and substance use, and ensuring workplace health and safety. In addition, SWAPE recommends that future industrial development be designed to incorporate the best available control technologies to reduce ambient air pollution.

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List of Acronyms

AAIR	Age-Adjusted Incidence Rate
ACS	American Cancer Society
AQI	Air Quality Index
BPOU	Baldwin Park Operable Unit
CAPs	Criteria Air Pollutants
CO	carbon monoxide
COPD	chronic obstructive pulmonary disease
HAPs	Hazardous Air Pollutants
IARC	International Agency for Research on Cancer
LARWQCB	Los Angeles Regional Water Quality Control Board
NAAQS	National Ambient Air Quality Standard
NEI	National Emissions Inventory (U.S. EPA Database)
NO2	nitrogen dioxide
NOx	oxides of nitrogen
O3	ozone
PAHs	polycyclic aromatic hydrocarbons
Pb	lead
PCBs	polychlorinated biphenyls
PCE	tetrachloroethylene
PM	particulate matter
ppbv	parts per billion by volume
SEER	National Cancer Institute Surveillance, Epidemiology, and End Results Program
SO2	sulfur dioxide
SWAPE	Soil / Water / Air Protection Enterprise
TRI	Toxic Release Inventory (U.S. EPA Database)
TCE	trichloroethylene
US EPA	United States Environmental Protection Agency
USC CSP	University of Southern California Cancer Surveillance Program
USGS	United States Geological Survey
VOCs	volatile organic compounds
WHO	World Health Organization

1. INTRODUCTION

1.1. PURPOSE AND ORGANIZATION OF REPORT

This report includes an analysis of cancer and air quality in the City of Irwindale. SWAPE was retained by the City of Irwindale to identify any significant differences in cancer incidence and pollution exposures of the City relative to its surroundings. Air quality measurements reported for the San Gabriel Valley region are examined, in addition to city- and county-wide pollution releases. Available data regarding Irwindale cancer incidence is compared to that of adjacent census tracts, Los Angeles County, and California. **Section 2** provides a description of Irwindale's environmental setting and demographics. In **Section 3**, data, methods, and general limitations are defined. Information pertaining to the identification of and misconceptions surrounding cancer clusters, as well as common cancer risk factors, are outlined in **Section 4**. Air quality, air pollution, and cancer incidence analyses are summarized and discussed in **Section 5.**

1.2. QUALIFICATIONS

I received a B.A. in Environmental Studies from the University of California at Santa Barbara in 1991, an M.S. in Environmental Science from the University of California at Berkeley in 1995, and a Ph.D. in Soil Chemistry from the University of Washington in 1999. I am a founder and principal environmental consulting scientist at SWAPE. In addition to my education, I have extensive experience in evaluating the fate and transport of environmental contaminants, risk and exposure assessment of contaminants released from pollution sources, and monitoring and modeling of pollution sources that may cause impacts on human health and ecological systems. I use my education, experience, knowledge and expertise to conduct field investigations and prepare risk assessments. I have performed investigation and assessment for both governmental and private entities concerning risks to human health and properties due to contamination from pesticides, polychlorinated biphenyls (PCBs), petroleum hydrocarbons, polycyclic aromatic hydrocarbons, dioxins/furans, volatile organics, chlorinated solvents, perchlorate, heavy metals, asbestos, perfluorooctanoic acid, and other hazardous substances.

I obtained much of my experience in evaluating contaminated sites while working for the United States Navy. I served as a Remedial Project Manager for the Navy Base Realignment and

Closure (BRAC) Team, South West Division on Treasure Island, California. While working for BRAC, I managed many sites with environmental contamination concerns, including a large tract of land with PCBs contamination on Treasure Island in San Francisco Bay, California. I also worked on Camp Pendleton remediating the soils during a 26 mile petroleum pipeline improvement project.

I have taught on the subject of environmental health at the University of California at Los Angeles (UCLA) for many years. I have been presenting courses at UCLA on environmental contaminants, exposure assessment, and related subject matter since 2002. I also regularly attend and speak at professional environmental conferences on various subjects involving environmental contamination and mitigation/remediation.

I have recently co-authored several books concerning environmental contamination and best practices in the chemical industry. These publications include "The Risks of Hazardous Waste" (2011), "Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Agrochemical Industry" (2011), "Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Wood and Paper Industries" (2010), and "Handbook of Pollution Prevention and Cleaner Production, Best Practices in the Petroleum Industry" (2009). I have also published extensively on other scientific studies of contaminant fate and transport and treatment technologies.

1.3. REVIEWED MATERIALS AND GENERAL LIMITATIONS

SWAPE has collected and reviewed scientific literature and data from regulatory agencies concerning common cancer risk factors, air quality, and environmental pollution. Documents that have been reviewed by SWAPE and used in preparation of this preliminary report were obtained from the following sources:

- U.S. EPA, Toxic Release Inventory (TRI) Database;
- U.S. EPA, National Emissions Inventory (NEI) Database;
- South Coast Air Quality Management District (AQMD);
- University of Southern California Cancer Surveillance Program (CSP);

- California Cancer Registry (CCR);
- USA Today's Smokestack Effect Special Report;
- Other sources.

Emissions data reviewed within this report are not representative of all industries and emissions in the San Gabriel Valley Region, because certain industries or facilities are exempt based upon industry category or size. Emissions data reported to the EPA may also be conservative, as they are self-reported by facilities. In the 2002 and 2005 NEI databases, some values are estimated based upon past reports. The NEI and TRI databases, however, are the most complete publicly-available resources documenting industrial pollution in the United States.

Some incompleteness was present in historical daily Air Quality Index data, perhaps due to instrument error. In addition, Irwindale lacks its own in-town monitoring station, so comparisons were made over a larger area encompassing multiple cities. Air quality data from two monitoring stations in the nearby cities of Azusa and Glendora are assumed to be most representative of Irwindale.

The present analysis described in this report does not include a retrospective exposure assessment for historical and existing groundwater contamination that was first identified in the Azusa and Irwindale area in the late 1970's. The groundwater contamination, which is briefly described below, has been addressed through several decades of work by environmental regulatory agencies, water companies, and responsible parties to design and construct treatment systems that ensure clean water for public consumption.

Groundwater in the greater San Gabriel Valley Basin contains several areas of contamination that have been defined through several decades of environmental investigations and regulatory compliance actions. These investigations have been primarily directed by the United States Environmental Protection Agency (U.S. EPA) and the Los Angeles Regional Water Quality Control Board (LARWQCB). These large groundwater contamination plumes in the San Gabriel Valley Basin are primarily impacted by commonly-used, industrial solvents, such as tetrachloroethylene (PCE) and trichloroethylene (TCE), which were first discovered in the City of Azusa in 1979. U.S. EPA declared portions of the San Gabriel Valley Basin as four separate Superfund sites in 1983 after discovering the contamination. The City of Irwindale is located in

the immediate area where one of these groundwater Superfund site plumes is likely to have originated. This particular plume is referred to as the Baldwin Park Operable Unit (BPOU).

During the early period of the discovery of the groundwater contamination present in the BPOU area, a large number of public water supply wells were found to be impacted. Subsequently, the public water systems that operated these wells were forced to shut down or construct treatment systems to remove the groundwater contaminants to acceptable standards prior to distribution in the public water system. U.S. EPA selected an overall cleanup plan for the Baldwin Park area in 1994 and this plan was updated in 1999. U.S. EPA reached agreement on a cleanup plan in 2002.

The BPOU groundwater cleanup remedy includes four large groundwater pump and treat systems capable of extracting and treating approximately 32 million gallons per day of contaminated groundwater. Historical exposure assessment associated with possible exposures to groundwater contaminants is not within the scope of this analysis. Furthermore, within the context and time frame of the existing cancer cluster assessment, it is not likely that exposures to this specific groundwater contamination have occurred.

2. BACKGROUND

2.1. ENVIRONMENTAL SETTING

The City of Irwindale is located within the East San Gabriel Valley region of Los Angeles County, California (see **Figure 2.1**). The San Gabriel Valley is just south of the San Gabriel Mountains, and northeast of the City of Los Angeles. The area consists of 47 cities and unincorporated areas and is home to extensive industry and business.

Since its founding in 1860, the City of Irwindale has remained a small, close-knit community of about 1,400 residents. About 700 businesses are located in Irwindale, including Ready Pac Produce, Charter Communications, Southern California Edison, Decorative Specialties, Miller Brewing Company, and California Community News. In total, Irwindale business and industry employs about 40,000 people daily and constitute the largest percentage of Irwindale's land use.[1] Processing and mining operations covered roughly 83% of the city's non-publicly-owned land in 1999.[2] Other notable companies include Miller Brewing Company, Pepsi, Huy Fong Foods, and Ready Pac Produce.[3]

2.2. IRWINDALE DEMOGRAPHICS

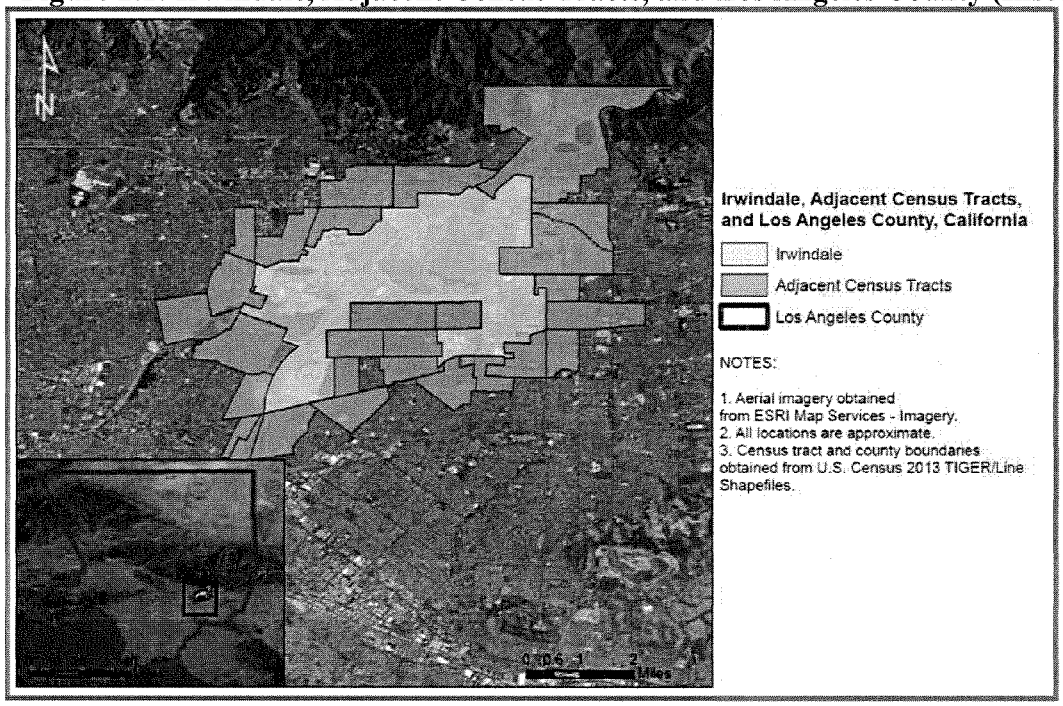
As of the 2010 Census, the population of Irwindale was about 1,400, with roughly 58.6 percent of the population identifying as white, 2% Native-American, 2.4% Asian, 0.8% African-America, 0.6% Pacific Islander, 4.8% two or more races, and the remainder (31.5%) from other races. The majority of the population (approximately 90.6%) identified as Hispanic or Latino. The largest age group (about 27.9% of the population) includes residents between 25 and 44 years of age. Children under the age of 18 and people 65 years or older constitute about 26.2% and 10.6% of the population, respectively.[4]

The City of Irwindale consists of one census tract and three zip codes. Irwindale is roughly 9.5 square miles in area, with approximately one percent of land dedicated to residential use, about 46% to industry and business, and the remainder consisting of open space, roads and railroads, government buildings, and vacant space.[1]

The City is bounded by 27 census tracts, and neighbors Azusa, Baldwin Park, Duarte, El Monte, Monrovia, and West Covina in addition to several unincorporated regions.[5] On average,

Irwindale temperatures range between 51 and 78 degrees Fahrenheit, and the City sees about 1.5 inches of rainfall per month.[1] From 2003 to present, winds have typically blown from the south and east.[6] The City is bounded by the 605 Highway to the West, the 210 to the North, the 10 Freeway to the south, and is located just south of the San Gabriel Mountains.

Figure 2.1: Irwindale, Adjacent Census Tracts, and Los Angeles County (Inset)



2.3. IRWINDALE AND SURROUNDING AREA SCHOOLS

In 2008, USA Today and the University of Massachusetts-Amherst Political Economy Research Institute published an inventory, titled "The Smokestack Effect", of United States schools, ranked by air quality based upon local pollutant exposures reported to the 2005 US EPA Toxics Release Inventory. The ranking is represented in a national percentile format. A percentile score of one percent indicates that a particular score is among the top one percent of schools with the worst air quality, whereas a score in the 99th percentile would correspond to a school that has better air quality than nearly all other US schools.[7] One Irwindale school is included in this special report, with a 54th percentile ranking, meaning it experiences better air quality than 54% of United States schools and is relatively close to the national average school air quality. Percentiles range between 20 and 59, 57 and 63, 51 and 67, 49 and 66, 66 and 71, and 55 and 62;

for Azusa, Baldwin Park, Duarte, El Monte, Monrovia, and West Covina Schools, respectively.[8] Based upon the ranges reported in these cities, San Gabriel Valley schools are relatively similar to the average air quality experienced at schools across the nation.

3. METHODS AND APPROACH

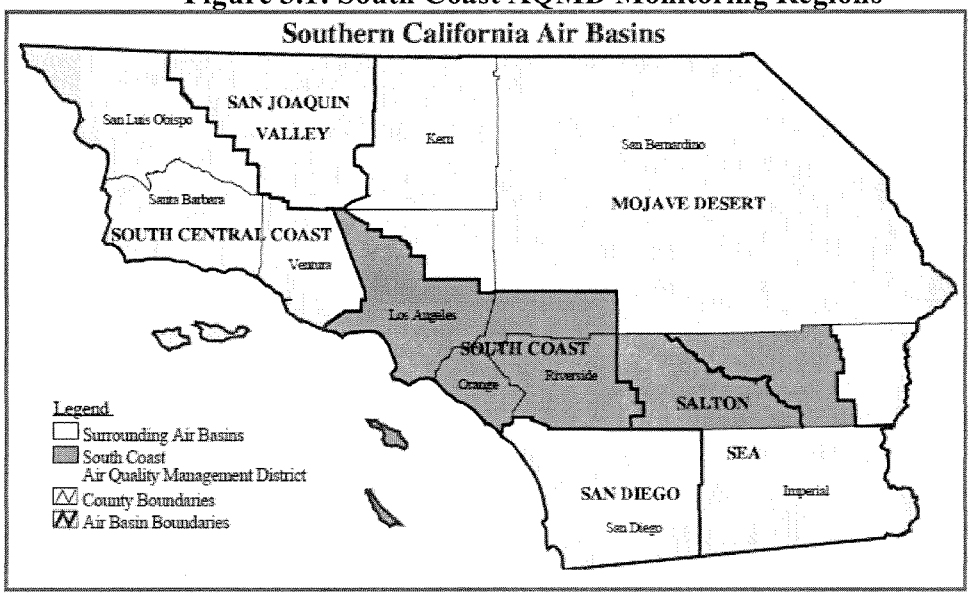
3.1. AIR POLLUTION AND AIR QUALITY

In evaluating air pollution of the area, SWAPE utilized two types of data: air monitoring data and emissions releases from facilities.

South Coast Air Quality Management District Monitoring Network

The South Coast Air Quality Management District (SCAQMD) is responsible for oversight and regulation of air quality in an area of Southern California comprised of portions of Los Angeles County, Riverside County, San Bernardino County, and all of Orange County (**Figure 3.1**). The map below displays the geographic extent of the district, highlighted in blue. The agency's objective is to attain state and federal clean air standards by implementing programs and strategies for mitigating releases of air contaminants from stationary and mobile sources. Air quality in the SCAQMD is measured at monitoring stations located throughout the district that record concentrations of air pollutants subject to state and federal regulations.

Figure 3.1: South Coast AQMD Monitoring Regions



Source: South Coast Air Quality Management District Annual Air Quality Monitoring Network Plan, 2013.

Daily reports of air quality are characterized by a value referred to as the Air Quality Index. The Air Quality Index (AQI) is a metric devised by the Environmental Protection Agency (EPA) that communicates the level of public health concern attributed to the collective measurement of five

(5) major air pollutants regulated by the Clean Air Act: sulfur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), ground-level ozone (O3), and particulate matter (PM10 and PM2.5). Concentrations of these five air contaminants (as well as Lead) are regulated on the federal level by the National Ambient Air Quality Standards (NAAQS). The AQI represents a comparison of each of the compounds to their respective NAAQS.

The AQI is calculated on a scale from 0-500, with higher values indicating greater levels of public health concern. **Figure 3.2** is provided on the AirNow.gov webpage and explains the significance of AQI value ranges.

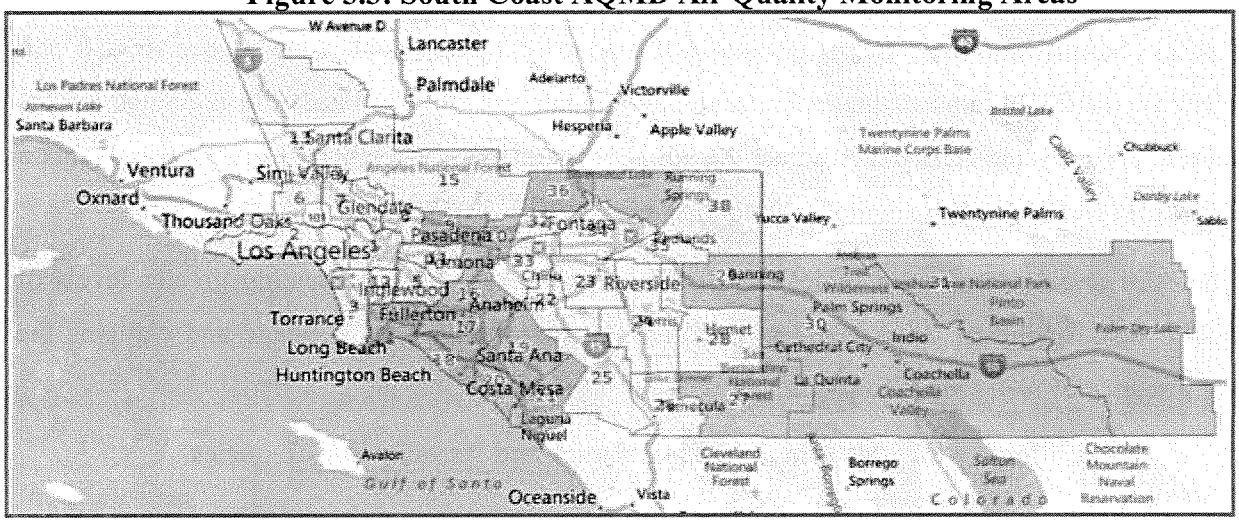
Figure 3.2: Air Quality Index Values and Associated Categories

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health warnings of emergency conditions. The entire population is more likely to be affected.
Hazardous	301 to 500	Health alert: everyone may experience more serious health effects

Source: AirNow.gov, Air Quality Index (AQI) - A Guide to Air Quality and Your Health.

AQI values up to 100 indicate that a NAAQS is not exceeded, and that typically there is no public health concern associated with the air quality. Above 100, the EPA has divided the AQI ratings into four categories, and a greater number of people are affected as the AQI category increases in severity.

Figure 3.3: South Coast AQMD Air Quality Monitoring Areas



Source: South Coast AQMD Air Quality Map, 2013.

Within the SCAQMD, there are 38 different "Areas" for which an AQI score is calculated each day. The City of Irwindale is located in Area 9, referred to as the "East San Gabriel Valley." Region 9 includes Irwindale, Arcadia, Baldwin Park, Covina, Azusa, Glendora, Duarte, Monrovia, Temple City, and overlaps parts of West Covina and El Monte. There are two monitoring stations that are used for AQI measurements within the East San Gabriel Valley. The three SCAQMD Areas adjacent to Area 9 with active monitoring stations are: Area 8 to the west (West San Gabriel Valley); Area 11 to the south (South San Gabriel Valley); and Area 10 to the east (Pomona/Walnut Valley). Each of these three Areas contains one monitoring station through which daily AQI values are recorded. Area 15, the fourth adjacent region to Area 9, lacks a monitoring station and is therefore not evaluated in this report.

In this analysis, daily AQI data is used to compare the Irwindale area with nearby cities. Historical AQI values from 2000 to 2012 were requested from the SCAQMD, for Areas 8, 9, 10, and 11. These regions were chosen to evaluate Irwindale's Air Quality against its immediate surroundings within the San Gabriel Valley area. Approximately 8% of daily AQI data was missing, perhaps due to instrument error.

United States Environmental Protection Agency Toxics Release Inventory

Each year, facilities report potentially hazardous releases, in pounds per year, to the US EPA Toxics Release Inventory (TRI). This inventory is mandatory for all federal facilities and certain utility, manufacturing, mining, wholesale, publishing, and hazardous waste facilities. These

facilities must report if they employ more than ten full-time equivalent employees, or manufacture or process over 25,000 pounds or otherwise use over 10,000 pounds, of a TRI-designated chemical in a year. Facilities releasing chemicals in amounts greater than established levels must report annual amounts of emissions or disposal of any of the more than 650 chemicals covered by the program. Los Angeles County facilities ranked by total releases were collected for the years 2001 through 2012 to assess how Irwindale facilities compared to facilities throughout the county.

United States Environmental Protection Agency National Emissions Inventory

The US EPA National Emissions Inventory (NEI), similar to TRI, is a database of facility releases. This data is compiled for air releases only. Releases of Criteria Air Pollutants (CAPs) or Hazardous Air Pollutants (HAPs) are reported to the NEI, which then releases a report every three years. Each NEI represents annual emissions, in tons per year, averaged over the three-year reporting period. In investigating Irwindale pollution sources, NEI data was found to list some facilities not reported in the TRI, so additional analysis was conducted using 2002 and 2005 NEI data. Annual emissions for the two reporting years were totaled and compared between Irwindale and its neighbors: Azusa, Baldwin Park, Duarte, El Monte, Monrovia, and West Covina. Criteria air pollutants and hazardous air pollutants are analyzed separately. Criteria air pollutants include particulate matter (PM), nitrogen oxides (NOX), ozone (O3), carbon monoxide (CO), volatile organic compounds (VOCs), and sulfur dioxide (SO2). Hazardous air pollutants, pollutants suspected or confirmed to cause cancer or other serious health and environmental effects, are also reported by these cities. It should be noted that some cities' reporting values were substituted from previous reports. Each city's reported data contained some substitution of values from previous NEI reports, except for Baldwin Park and Duarte's 2002 HAP data. A breakdown of emissions per Irwindale facility is also provided, in **Appendix C**.

3.2. CANCER INCIDENCE

Cancer incidence data is available at the national, state, and county level. United States cancer statistics are managed by the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program. State cancer incidence data is reported to the SEER Program by the

California Cancer Registry (CCR), which is a compilation of data reported by California counties.[9]

University of Southern California Cancer Surveillance Program

SWAPE contacted the University of California Cancer Surveillance Program (USC CSP) to explore differences in cancer incidence between Irwindale and its surroundings. The Cancer Surveillance Program manages a database of all cancer diagnoses within Los Angeles County, and reports these data to the CCR and SEER Program. Cases reported to the CSP are the basis for county-wide analyses using patient age, year of diagnosis, sex, and race/ethnicity.[10] Cases are assigned to census tracts based upon the residential address of the patient at the time of diagnosis. The CSP is considered the authoritative body for evaluating any suspected cancer clusters in Los Angeles County.

In this case, the annual age-adjusted incidence rate (AAIR) of Irwindale is compared to its surroundings for several cancer types. Annual age-adjusted incidence rates are the number of new cancer cases diagnosed each year per 100,000 people, weighted by age. In this standard cohort comparison, the CSP calculated 2001-2010 AAIRs for five cancer sites: all, breast, colon, lung and oropharyngeal, and prostate. Other cancers, which occurred in such low numbers, could not be disclosed for confidentiality reasons. Annual age-adjusted incidence rates were calculated for four regional breakdowns: Irwindale, all census tracts sharing a border with Irwindale, Los Angeles County, and California. Next, the AAIR of Irwindale was compared to each of the other three regional denominations, to assess whether Irwindale had a significant excess of cancer incidence. Annual age-adjusted incidence rates in this analysis were calculated for each cancer site by summing all cases from each region, then dividing these cases into five-year age groups. Population data from the 2010 US Census was also divided into five-year age groups. These case and population counts were then used to calculate a rate for each age group. Next, all age group rates were combined and weighting was performed based upon 2000 US Census age distributions. Weighting by age distribution, or age-adjustment, is performed to avoid confounding due to age.

3.3. LITERATURE REVIEW

Definitions and evaluation of cancer clusters, in addition to common misconceptions, are described in more detail below. Existing literature regarding cancer incidence and common risk factors for the cancers of interest was reviewed to evaluate the degree of contributions that age, genetics, lifestyle, and environmental pollution have upon cancer risk.

4. LITERATURE REVIEW

4.1. CANCER INCIDENCE

According to the California Cancer Registry, a cancer cluster is an excess of cases of a particular cancer that has been determined to be unusual when compared to expected cancer incidence patterns. A cancer cluster is characterized in how the excess occurs, whether within a certain group of people, location, or time period.

To transition from a suspected cancer cluster to a confirmed cluster, the perceived excess must be determined to be statistically significant by public health officials.[11] In California, cancer clusters are evaluated according to CCR procedure. Once a cluster is reported, basic information is gathered such as amount, location, time period, and types of cases, in addition to the contact information of the reporter and how they became aware of the cases.[12] Before initiating an investigation, health officials provide the informant with educational materials regarding cancer incidence in their area, common risk factors, and national organizations to refer to for further information. If an increase in cancer frequency, occurrence of a rare form, or occurrence within a distinct population is confirmed, and any of these three events is documented along with a carcinogenic agent, registered cases, and a probable route of exposure, a statistical evaluation is deemed necessary. It is important to note that a statistical evaluation is performed to determine whether the perceived increase in cancer cases is truly in excess relative to expected patterns. Statistically significant increases do not identify the cause nor do they rule out chance, they simply confirm an excess of cancer.[11] If an excess is identified, the cause can be a combination of a wide range of factors, such as occupational and environmental exposure, lifestyle choices, or family history and genetics.

Further uncertainty is added by a lack of agreement regarding the degree of contribution of different variables to cancer risk and incidence. McGuinn et al. (2012) discusses how differences in environmental contribution estimates are mostly due to the variation of factors that are encompassed within a given study's definition of environmental exposure. In a review of over 250 reports, estimates of the contribution of environmental factors to cancer rates ranged from one to one hundred percent. Most reports defining environmental exposures as "air, water, food, and soil pollutants" resulted in smaller environmental risk estimates, whereas those which used

broader terms (including lifestyle and occupational exposure) concluded with higher estimates of environmental contribution to cancer occurrence.[13] In this analysis, environmental exposure is defined as air pollutants, to avoid any confusion regarding environmental pollutant contributions to cancer risk. Contributions of environmental pollution, fitness, substance use, genetics, and occupation to risks of developing common cancers are reviewed in existing literature.

4.2. CONTRIBUTING FACTORS

Of all cancer types, five to ten percent stem from inherited genetic mutations.[14] The remaining 90-95% are therefore influenced by other factors, such as environmental, occupational, and lifestyle exposures. In a 1996 report, the Harvard School of Public Health attributed 68% of overall cancer causes to lifestyle factors such as tobacco use (30%), diet, alcohol consumption, and exercise, 13% to genetics and family history, and 19% to occupational sources, two percent of which is attributed to pollution.[12] As demonstrated by multiple studies, if changes in lifestyle and occupational settings are made, cancer risk can be decreased dramatically.

Family History and Age

Overall, cancer risk tends to increase with age and family history. Breast cancer is more common in older, female patients. After age and gender, breast cancer risk is influenced by genetics in 5-10% of cases.[15] Prostate cancer risk, like breast cancer, rises with age, with most cases being diagnosed in men between 65 and 74 years of age.[16,17] Family history is also cited to play a role for the cancers evaluated in this study.[18,19,20,21] Other factors appear to have a greater role, however. For example, while family history of breast cancer can have a doubling effect upon risk, the majority of cases (85%) occur in women who lack a family history of breast cancer.[18]

Fitness

Up to 14% of male cancer-related deaths and 20% of cancer deaths in females are linked to being overweight or obese.[14] Incorporating a healthy diet and exercise into one's daily life has been observed to be inversely associated with colon cancer risk.[22,23] Boutron-Rualt et al. (2001) observed an increased colon cancer risk in subjects that exercised infrequently and had a high caloric intake.[24] In a 2002 review of epidemiologic studies investigating exercise and cancer risk, the majority of studies to date for colon, breast, prostate, and lung cancer risk reduction found

convincing, probable, or possible associations. Colon and breast cancer risk reduction were most convincingly linked with increased exercise, whereas prostate and lung cancer studies saw probable and possible associations, respectively.[25] The contribution of diet varies depending on intakes of differing amounts of fat, calories, foods, or vitamins. Poor diet and increases in weight both raise breast cancer risk, although the agreement of the extent of their contributions is limited.[26,27] Relative risks associated with high total fat intake and breast cancer ranged from 0.49 to 1.72, 0.29-5.43, and 0.90-1.28 for those with high total fat intakes, according to three dietary reviews.[28,29,30] Vitamin A and Vitamin D coupled with adequate sunlight exposure have been associated with breast cancer risk reductions of 22% (in premenopausal women) and 25-60%, respectively.[31,32] Higher intakes of beans and lentils were associated with decreased prostate cancer risks of 52% in participants that consumed them more than three times per week compared to less than once per month.[33] Colon cancer risk factors demonstrated in multiple reports include poor diet and lack of exercise, and, in men, increased waist circumference.[34,35] Body mass index (BMI) increases along with smoking were associated with increased colon cancer risk when compared to both male and female smokers with lower BMIs.[36] Healthy diet and exercise are essential preventative measures, as increases in mortality due to colon, breast, prostate, liver, and pancreas cancers have been observed in those who are overweight or obese.

Tobacco and Alcohol Use

In 1986, the International Agency for Research on Cancer (IARC) named tobacco smoke as the major cause of "cancers of the lung, oral cavity, pharynx, larynx, oesophagus (squamous-cell carcinoma), pancreas, urinary bladder and renal pelvis", with lung cancer being the "most common cause of death from cancer in the world." Tobacco smoke is cited as reasonably causing about one third of all cancer-related deaths in the United States[37]. Exposure to secondhand smoke has also increased the risk of lung cancer in non-smokers.[38,39] Lung cancer risks increase with duration of use and exposure intensity due to depth of inhalation and smoking device used.[40] A 2001 study of 106 patients with primary adenocarcinoma of the lung observed a high fraction (87%) of smokers within the participants.[41] Another study also mentions cigarette use in nearly 90% of lung cancer diagnoses.[14] According to the American Cancer Society (ACS), alcohol consumption along with tobacco use can have synergistic effects upon the risk of developing cancers of the larynx and hypopharynx. The ACS advises citizens to avoid tobacco

and alcohol, especially in combination; and to ensure adequate workplace ventilation and nutrition.[42]

The contribution of tobacco smoke to breast and colon cancer risk is more debated in the scientific community. Suggested effects of tobacco smoke on breast cancer risk are still relatively unclear.[18] Smoking, secondhand smoke, and alcohol consumption all raise breast cancer risk, although the agreement of the extents of their contributions is limited.[43,44] Studies vary from conclusions of no effect[45] to observations of both decreased and increased risk in female smokers who carry $BRCA_1$ or $BRCA_2$ gene mutations.[44,46] Several studies conclude that tobacco smoke has little to no independent effect on breast cancer; rather, its contribution to risk has been confounded by alcohol consumption,[45] or it increases risk in women that are more genetically susceptible.[44, 47, 48] Potter et al. (1993) concludes that the most significant environmental exposure affecting colon cancer incidence is represented by tobacco smoke inhaled from cigars and pipes.[49] However, cigarette smoke is also shown to increase colon cancer risk in women who smoked more than 35 pack-years or more than 20 cigarettes daily.[36]

The effect of alcohol consumption, while more certain than other lifestyle-related factors, also varies widely across studies. Alcohol consumption increases risk of breast and colorectal cancer, and, when coupled with smoking, can have synergistic effects upon the risks of developing cancer in the oral cavity, pharynx, and esophagus. An average alcohol consumption of more than 60g per day was associated with a relative risk of 9.2 [95% CI, 2.8-31.0] for cancer in the upper gastrointestinal tract.[50] In the upper aerodigestive tract, alcohol consumption alone has been observed to cause 25-68% of cancers.[14] Breast cancer risk due to high alcohol consumption was demonstrated to range between 28 and 72 percent in participants who consumed more than 15 grams of alcohol each day, while another study saw a risk of 52% in participants consuming just over 5 grams of alcohol per day, compared to non-drinkers.[51, 52] In an analysis of 53 epidemiological studies, the risk of developing breast cancer increased by an average of 7.1% with every 10 gram increase in daily consumption, however, this same study found that smoking had little or no effect.[45] An intake of two or more alcoholic drinks per day has been shown to increase colon cancer risk,[53, 54] while other studies have failed to demonstrate statistically significant links between the two.[49] Prostate cancer has not been found to be significantly influenced by alcohol consumption.[55]

Environmental Pollution

Air pollutant contributions are possible for a multitude of ambient and occupational exposures. Occupational exposures to pesticides, solvents, and polycyclic aromatic hydrocarbons (PAHs) have been found to increase breast cancer to various extents. Male exposure to combustion products such as 1,3-butadiene, 1,2-dibromomethane, 1,2-dichloroethane, and benzene for more than three months were associated with an odds ratio of 2.2, which increased to 2.5 when a ten-year lag time was incorporated.[56] According to the Silent Spring Institute, breast cancer studies in human regarding risks attributable to environmental pollutants have been relatively limited due to difficulties in quantifying oftentimes widespread exposures, and variations in individual traits across participants.[57] Lung cancer appears to have the strongest association with air pollutant exposure. The strongest evidence between air pollutants and lung cancer can be observed in occupational exposure studies. Benzene, asbestos, fibers, metals, coal tar, and substances present in wood dust and paint are all linked to cancer of the lung or nasal cavity. Aluminum production, boot and shoe manufacture and repair, coal gasification, coke production, furniture and cabinet making, haematite mining, iron and steel founding are listed by the IARC as causing cancer in the lung and nasal cavity. About 20% of cancer cases in people working in mining, agriculture, or industry can be attributable to occupational carcinogens. Indoor air pollution also increases lung cancer incidence, especially in poorly ventilated buildings.[58]

Of all cancer cases, 1-4% is accepted to be due to air, water, and soil pollution. Many studies investigating air pollutant-related cancer incidence have focused upon urban environments, with the lungs as the cancer site of interest. Varying degrees of associations have been observed. In a study adjusted for smoking, BMI, education, and alcohol intake, lung cancer incidence was observed to increase by 37% in participants exposed to NO2 concentrations 100 ug/m^3 higher than participants in less polluted areas.[59] Nyberg et al., (2000) also found a significant link between air pollution and lung cancer, primarily in those exposed to high levels of NO2, while observing a weaker relationship due to SO2 exposure. For participants exposed to twenty-year NO2 average concentrations greater than 29.3 ug/m3, lung cancer risks increased, even more rapidly if the participants were former or current smokers.[60] Levels of ambient NO2 in Montreal were found to increase prostate and post-menopausal breast cancer risks.[61,62] Despite links to increased risk, NO2 is not listed as a carcinogen, though it is an indicator of traffic-related

pollution. Another study involving 6,338 Californian participants showed frequent levels of PM10 concentrations exceeding 100 ppb could significantly increase male lung cancer incidence. SO2 levels were also strongly associated with lung cancer in both males and females.[63] While industrial facilities can be unhealthy point sources, attention must also be paid to improving traffic conditions and fuel efficiency, as there is growing evidence suggesting that traffic-related pollution is a significant risk factor. In developed countries, industrial emissions have mostly decreased over time while traffic-related emissions have become more of a concern.[58]

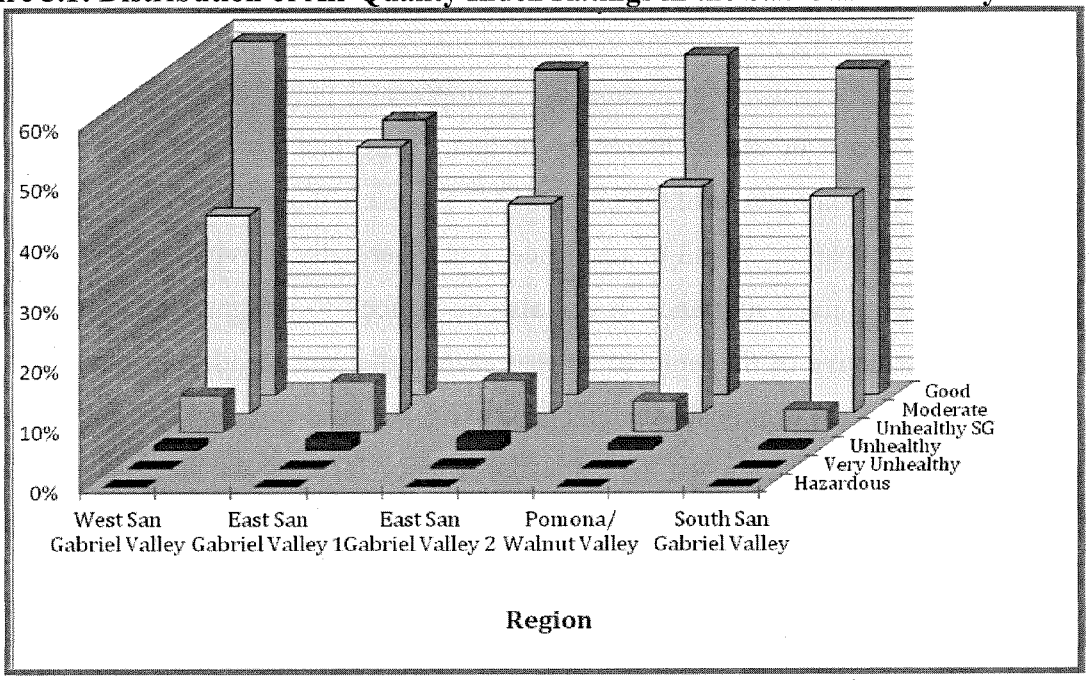
It is difficult to structure studies surrounding cancer risk factors, especially when quantifying each study participant's true exposures. Cancer incidence attributable to air pollution is receiving increased attention, especially as concepts of sustainability are becoming more widely accepted. Despite mounting evidence, the contribution of environmental pollution is perhaps the most widely debated risk factor in cancer literature. In fact, particulate matter has only just been identified as a known carcinogen as of October 2013.[64] Exposure to air pollutants depends upon residential address, occupation, length of residence, and other daily activities that may bring a person in contact with a given substance. It can also be difficult to designate an air monitoring station that is representative of the ambient air that each participant breathes in throughout the day. Hundreds of confirmed or probable carcinogens exist, but even exposure to these chemicals may have no noticeable effect due to the large opportunity for variance in cancer incidence caused by the complex interactions between risk factors. For all cancer risk factors, there is still much work to be done to identify how significantly each contributes to cancer incidence, both individually and in combination.

5. RESULTS

5.1. AIR QUALITY INDEX

Daily AQI values from 2000-2012 were obtained from the SCAQMD for Areas 8, 9, 10, and 11 to examine the regional scale of air pollution in the San Gabriel Valley. The data were organized into the five air quality classifications as presented in the Air Quality Index for each of the Areas. **Figure 5.1** displays the percentage of days over the thirteen year duration that fell into each air quality category.

Figure 5.1: Distribution of Air Quality Index Ratings in the San Gabriel Valley 2000-2012



Source: South Coast Air Quality Management District, Public Records Request # 74719

Acceptable air quality (AQI < 100, "Good" or "Moderate) was recorded with the following prevalence by Area:

8) 91.45%
9.a) 89.68%
9.b) 88.48%
10) 93.62%
11) 89.85%

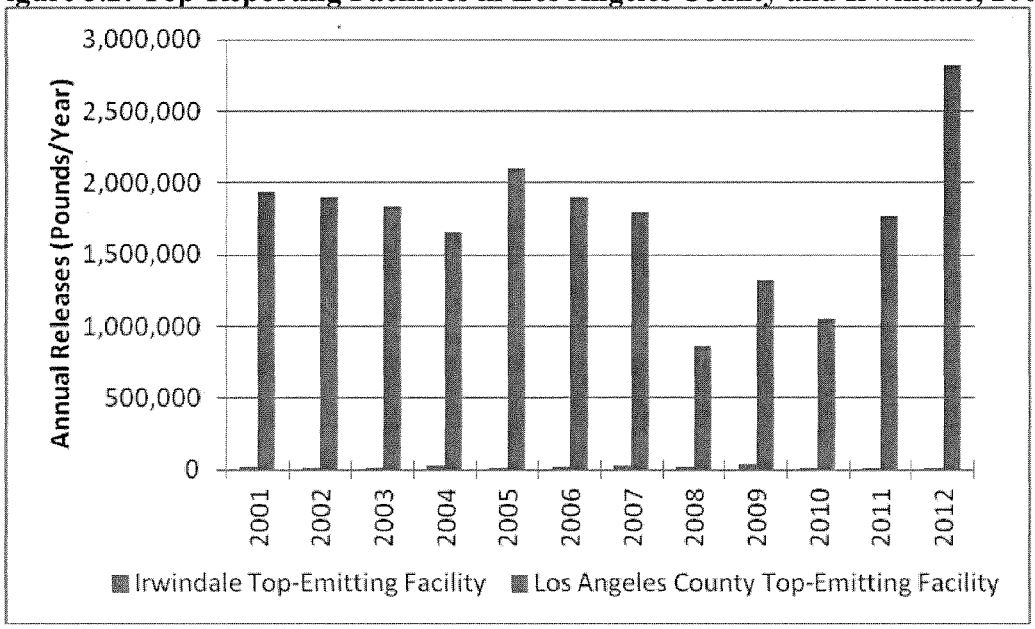
In general, there is no distinguishable contrast between the East San Gabriel Valley and the surrounding SCAQMD Areas with regards to AQI monitoring for Criteria Air Pollutants (CAPs).

Furthermore, of the chemicals constituting the AQI, only certain constituents of airborne particulate matter (primarily diesel) are associated with carcinogenic health effects. Therefore there is no discernible increased air quality concern associated with living in Irwindale from the standpoint of the AQI with regards to environmental exposures to carcinogens.

5.2. FACILITY EMISSIONS

Between 2001 and 2012, approximately 450 Los Angeles County facilities reported emissions to the US EPA Toxics Release Inventory. Out of all reporting facilities in the county, only one or two Irwindale-based facilities were within the top 100 each year. The highest reporting facilities in the county reported emissions 36 to 580 times greater than those of the largest reporting Irwindale site. On average, the highest reporting county site emissions were 90 times greater than those of Irwindale. The greatest difference between the county's top reporting facility and Irwindale's occurred in 2012, during which the highest-emitting site was 500 times greater. As shown in **Figure 5.2**, Irwindale's highest-emitting sites are only a fraction of other facilities within Los Angeles County.

Figure 5.2: Top-Reporting Facilities in Los Angeles County and Irwindale, 2001-2012

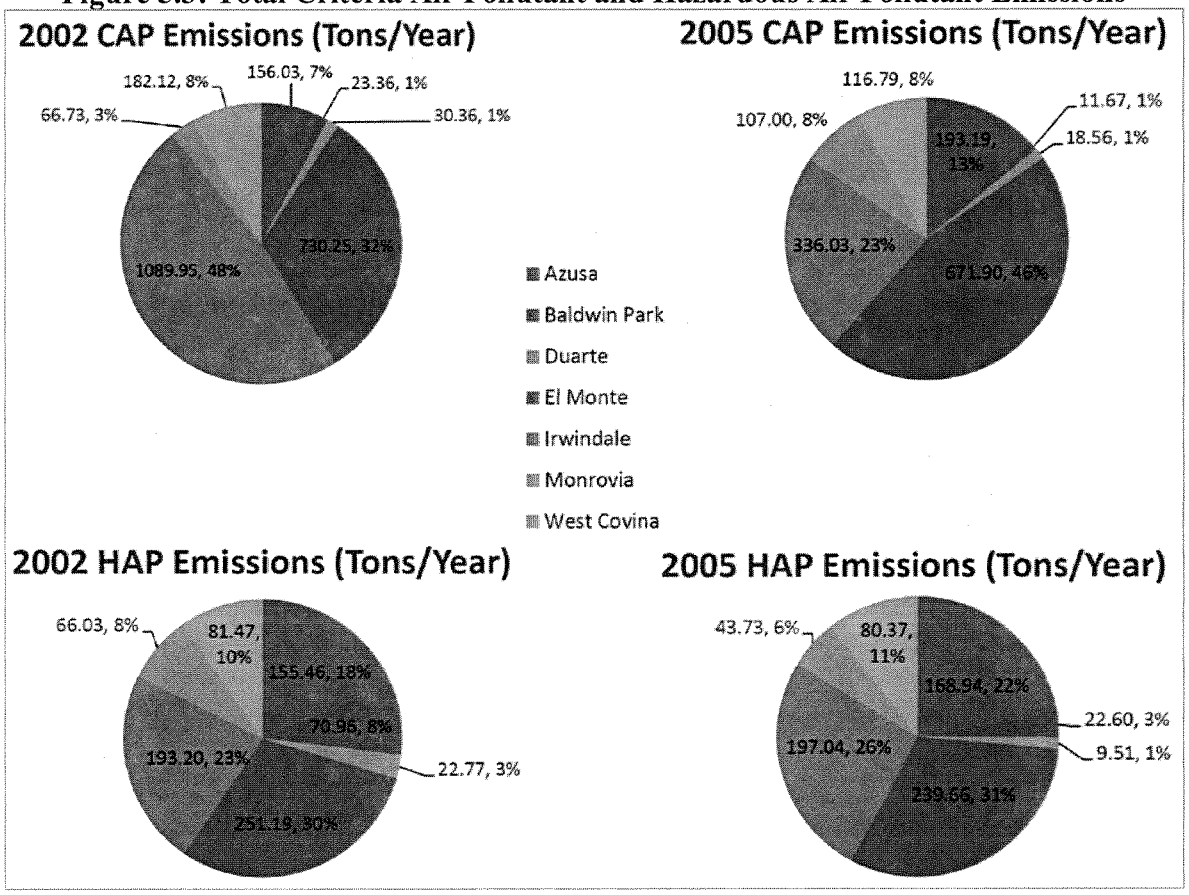


Source: U.S. EPA TRI, 2001-2012.

US EPA 2002 and 2005 National Emissions Inventory annual emissions were totaled and compared for seven cities: Irwindale, Azusa, Baldwin Park, Duarte, El Monte, Monrovia, and

West Covina. **Figure 5.3** displays overall CAP and HAP releases in the seven cities for both reporting periods. In 2002, El Monte emitted the most HAPs, while Irwindale reported the most overall CAPs emissions. In 2005, El Monte emitted the greatest fraction of CAPs and HAPs, 46% and 31%, respectively.

Figure 5.3: Total Criteria Air Pollutant and Hazardous Air Pollutant Emissions



Sources: U.S. EPA NEI, 2002; U.S. EPA NEI, 2005.

Emissions of criteria air pollutants represent the majority of Irwindale's emissions. Besides particulate matter, all CAPs emitted by Irwindale and its surroundings are not listed as known carcinogens. Particulate matter emitted by Irwindale represents less than two percent of CAP and HAP emissions from all seven cities, and was not even the maximum amount emitted out of the cities evaluated. Irwindale facilities emitted mostly carbon monoxide, volatile organic compounds, and nitrogen oxides during both periods. In the 2005 NEI, Irwindale reported CAP emissions were approximately 750 tons per year lower than in 2002 (See **Table 5.1**).

Table 5.1: Irwindale Criteria Air Pollutant Releases

Pollutant	2002 Irwindale Annual Emissions (Tons/Year)	Pollutant	2005 Irwindale Annual Emissions (Tons/Year)
CO	860.3	VOC	129.72
VOC	143.4	CO	109.47
NOX	44.85	NOX	41.11
PM-10	19.62	PM-10	29.4
PM-2.5	16.37	NH3	16.26
NH3	4.96	PM-2.5	9.68
SO2	0.45	SO2	0.38
All	**1089.95**	**All**	**336.03**

Sources: EPA NEI, 2002; EPA NEI, 2005.

Irwindale reported 58 and 75 HAPs in the 2002 and 2005 NEIs, respectively. In the 2002 NEI, Irwindale HAP emissions range from$1.24x10^{-8}$ tons per year of fluorine to 111.24 tons per year of toluene. Irwindale emissions reported in the 2005 NEI range from $3.93x10^{-10}$ tons per year of polychlorinated dibenzofurans to 111.52 tons per year of toluene (**Table 5.2**).

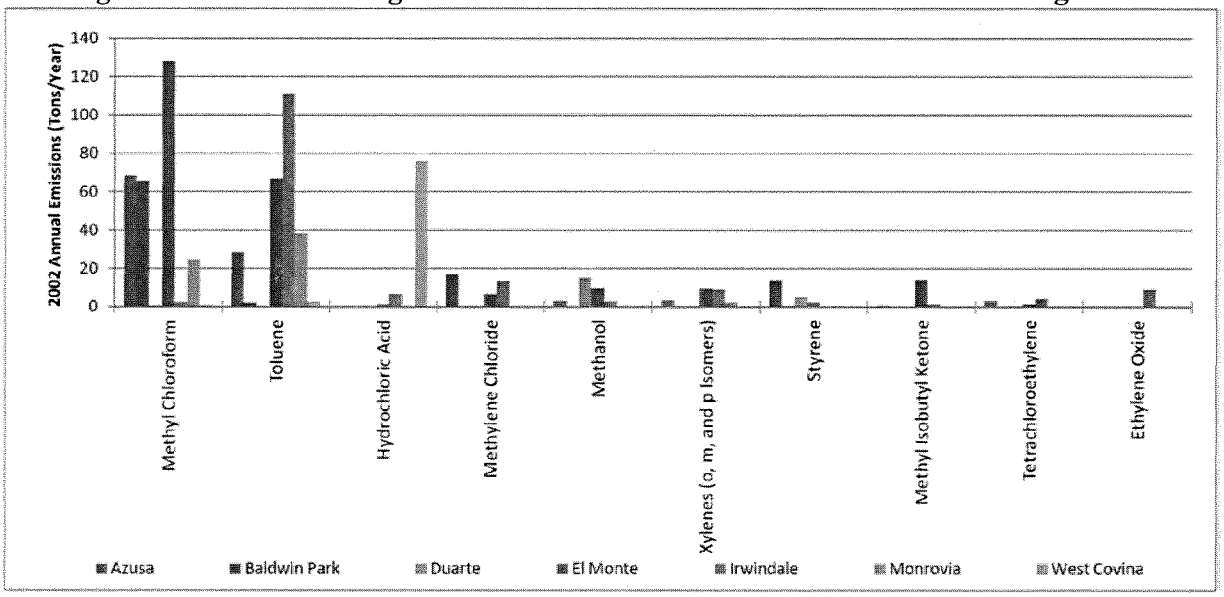
Table 5.2: Irwindale Minimum and Maximum Hazardous Air Pollutant Releases

Year	Least-Emitted Pollutant	Amount (Tons/Year)	Most-emitted Pollutant	Amount (Tons/Year)
2002	Fluorene	$1.24x10^{-8}$	Toluene	111.24
2005	Polychlorinated Dibenzofurans	$3.93x10^{-10}$	Toluene	111.52

Sources: EPA NEI, 2002; EPA NEI, 2005.

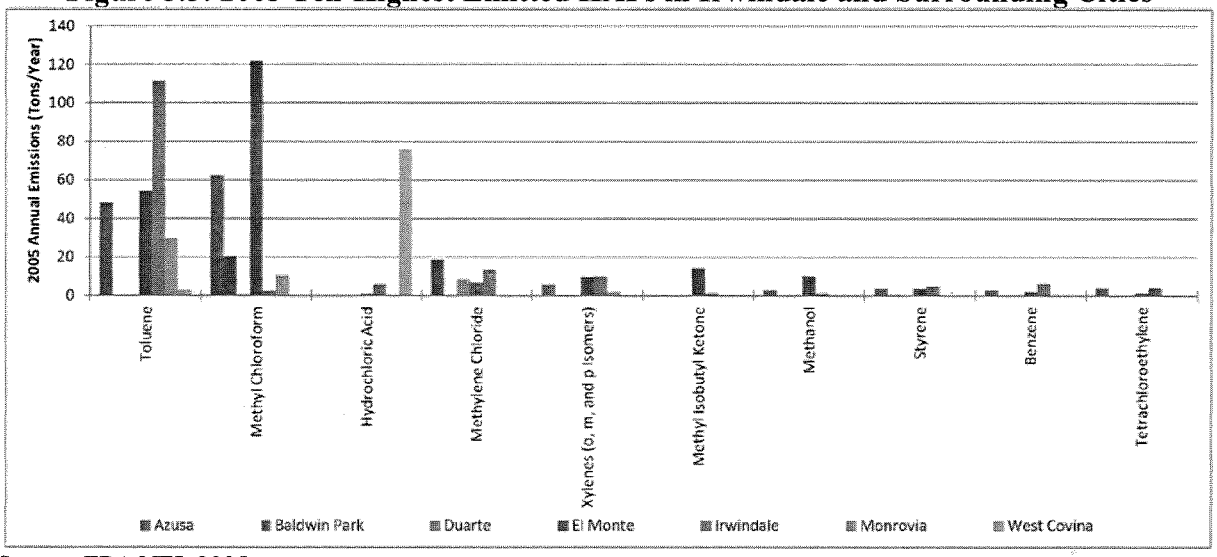
Figures 5.4 & 5.5 display the ten HAPs most reported during both reporting periods. In 2002, methyl chloroform was the most-reported pollutant, with El Monte emitting the greatest fraction, approximately 128 tons per year. In 2005, toluene replaced methyl chloroform as the most-emitted HAP. Irwindale produced the largest portion, about 111 tons per year. Out of all seven cities, Irwindale's most noticeable contribution can be seen in toluene emissions. Toluene represents the majority of Irwindale's HAP emissions, however, this substance is not classified as a carcinogen by the IARC.

Figure 5.4: 2002 Ten-Highest Emitted HAPs in Irwindale and Surrounding Cities



Source: EPA NEI, 2002.

Figure 5.5: 2005 Ten-Highest Emitted HAPs in Irwindale and Surrounding Cities



Source: EPA NEI, 2005.

Of the 87 HAPs reported by all seven cities in 2002, 13 are currently listed as known carcinogens by IARC.[65] Twelve of the 111 HAPs reported in the 2005 NEI are known carcinogens. Overall, Irwindale emissions of known carcinogenic HAPs were approximately three percent of all HAPs emissions within the seven cities during both periods. While Irwindale emissions are not a small portion of local emissions, carcinogenic compounds represent a very slight percentage of emissions from the seven cities evaluated.

5.3. CANCER INCIDENCE

During the ten year period of analysis, 47 cancer cases were diagnosed within the Irwindale census tract. Breast and lung and oropharyngeal cancers each occurred in six of the cases, prostate cancer was diagnosed five times, and colon cancer was diagnosed in three residents. The remaining 27 diagnoses occurred in 21 different anatomic sites, and could not be specified further due to confidentiality purposes. Total diagnoses for each cancer site and region of comparison are provided in **Appendix A**. All diagnoses for Irwindale and the three areas of comparison were adjusted for age and population.

The AAIRs for each cancer site were used to make comparisons between Irwindale and its adjacent census tracts, Los Angeles County, and California. Irwindale AAIRs were divided by the respective AAIRs of the other three regions to obtain ratios between the City and each region (**Table 5.3**). For all cancer sites, Irwindale AAIRs ranged from being 11% to 28% lower than its surroundings. Out of the four cancer sites analyzed, the highest ratio observed, 0.81:1, was that of Irwindale versus adjacent census tracts, for lung and oropharyngeal cancers. The lowest ratio, 0.53:1, was observed between Irwindale and California breast cancer AAIRs.

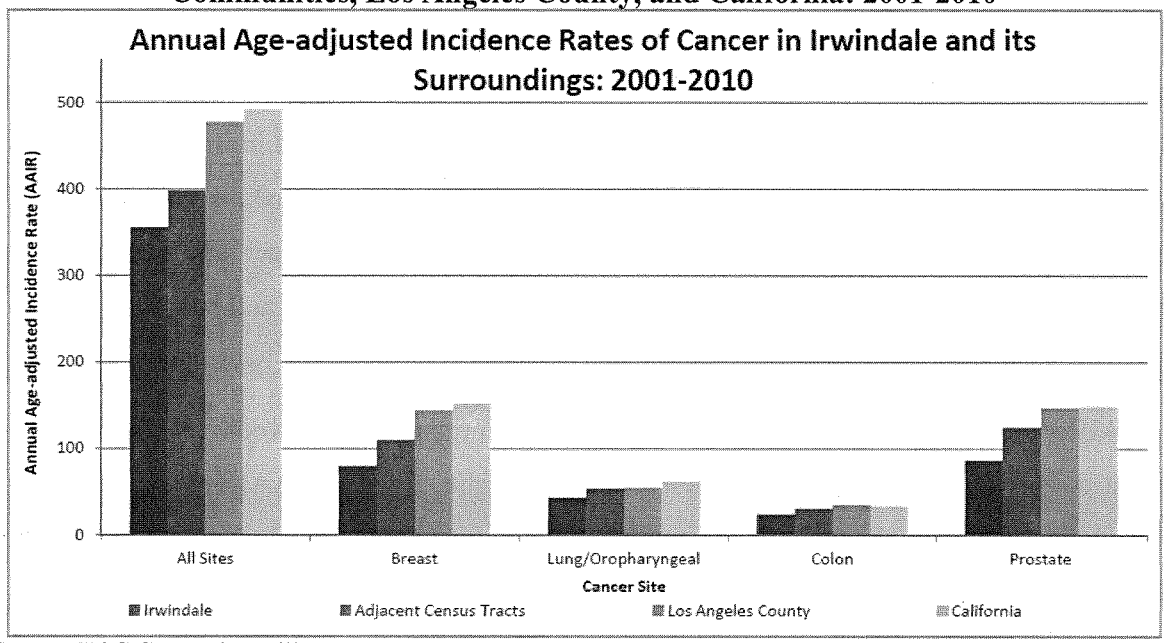
Table 5.3: Irwindale Cancer Incidence Rates vs. Adjacent Tracts, Los Angeles County, and California: 2001 – 2010

Site	Irwindale vs. Surrounding Census Tracts	Irwindale vs. Los Angeles County	Irwindale vs. California
All Cancers	0.89:1	0.74:1	0.72:1
Breast	0.73:1	0.55:1	0.53:1
Lung/Oropharyngeal	0.81:1	0.80:1	0.70:1
Colon	0.79:1	0.69:1	0.72:1
Prostate	0.70:1	0.59:1	0.58:1

Source: USC Cancer Surveillance Program, 2001-2010.

To examine variations in incidence between Irwindale and different regions, three regional areas of comparison were chosen to ensure that certain trends would not be overlooked when comparing diagnoses over regions of differing area. AAIR ratios mostly decreased as the region of comparison grew larger (**Figure 5.6**). Only colon cancer AAIR ratios were observed to decrease then increase as the area of comparison increased.

Figure 5.6: Annual Age-Adjusted Incidence Rates in Irwindale vs. Neighboring Communities, Los Angeles County, and California: 2001-2010



Source: USC Cancer Surveillance Program, 2001-2010.

As shown by **Table 5.3**, Irwindale's incidence rates are less than other regions for all cancers and all regional comparisons. A value less than one indicates that the Irwindale AAIR is below that of the region with which it was compared. The CSP concludes that the City does not possess an unusually high nor low incidence rate for all cancers (see **Appendix B**). The AAIRs of the adjacent tracts are also relatively low when compared to county and state rates. Adjacent census tract AAIRs were 17%, 24%, 13%, 2%, and 15% lower than Los Angeles rates for all, breast, colon, lung and oropharyngeal, and prostate cancers, respectively. Compared to California AAIRs, adjacent census tract values were 19%, 28%, 9%, 14%, and 16% lower, for all, breast, colon, lung and oropharyngeal, and prostate cancers, respectively.

As demonstrated in **Figure 5.6**, relative AAIRs were highest for all four cancer sites when comparing Irwindale to adjacent census tracts. The slight differences between Irwindale and adjacent census tracts relative to the other two regional breakdowns are not unexpected, given the immediate proximity of the adjacent tracts. Los Angeles County and California differ more significantly from Irwindale in geographic area, demographics, and environmental setting; which is reflected in the greater amount of difference between incidence rates of the two regions. However, in all cases, the AAIR ratios are less than one, indicating that Irwindale does not have a significant excess or deficit of cancer diagnoses relative to the three regions of analysis.

6. CONCLUSIONS

Compared to surrounding census tracts, Los Angeles County, and California, Irwindale's cancer incidence is lower than expected. No excess was observed in any single cancer site during the ten-year period of analysis. The slight fraction of known carcinogens emitted in Irwindale and its surroundings, the majority of "Good" and "Moderate" air quality days, and the lack of an excess of cancer incidence demonstrate that industrial emissions have not caused increased cancer incidence in Irwindale. Although the San Gabriel Valley is a region of heavy traffic, multiple industries, and moderate air quality, this pollution appears to have not increased cancer incidence in Irwindale.

Given constantly-evolving scientific knowledge regarding risk factors and their interactions, SWAPE recommends a proactive approach to avoid higher than usual cancer incidences in the future. There are many preventative measures that can be made to significantly lower chances of developing cancer, including maintenance of a healthy diet and weight, regular exercise, and consumption of little to no tobacco and alcohol. Proper ventilation in homes and the workplace can lessen exposure to indoor and outdoor air pollutants. Finally, future industrial development should be designed to incorporate the best available control technologies to reduce ambient air pollution.

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Appendix A

Cancer Diagnoses in Irwindale and Surrounding Regions 2001-2010

	Irwindale	Adjacent Census Tracts	Los Angeles County	California
All Cancer Sites	47	5,762	451,722	1,800,046
Breast	6	907	75,480	302,776
Lung/Oropharyngeal	6	744	50,401	224,035
Colon	3	432	32,755	121,190
Prostate	5	759	60,242	240,967

Appendix B

University of Southern California
Cancer Surveillance Program
Cancer Incidence Analysis

Keck School of Medicine of USC

USC Cancer Surveillance Program
Department of Preventive Medicine

October 22, 2013

Paul Rosenfeld PhD
Soil Water Air Protection Enterprise
1640 5th Street, Suite 204
Santa Monica CA 90401

Dear Dr. Rosenfeld:

In your capacity as the representative of the City of Irwindale, you have requested on the city's behalf information about the risks from cancer (all sites, breast, lung/oropharyngeal, colon, and prostate) to residents of the city in comparison with surrounding localities (census tracts), the County of Los Angeles as a whole, and the state of California. We are pleased to provide the following information in response to the request.

	Irwindale 2001-2010			Irwindale AAIR relative to that for:		
Site	# (Cases)	Annual Age-adjusted Incidence Rate/100K (AAIR)		Surrounding Census Tracts 2001-2010	Los Angeles County 2001-2010	California 2001-2010
All Sites	**47**	***355.69***		**0.89**	**0.74**	**0.72**
Breast	**6**	***80.21***		**0.73**	**0.55**	**0.53**
Lung/Oropharyngeal	**6**	***43.80***		**0.81**	**0.80**	**0.70**
Colon	**3**	***24.43***		**0.79**	**0.69**	**0.72**
Prostate	**5**	***86.92***		**0.70**	**0.59**	**0.58**

Since the city made this request on the basis of general concerns about air pollution generated by freeway traffic and the local mining industry, it is appropriate to evaluate the biological meaningfulness of each of the 15 comparisons. Although they are consistent in suggesting a relative deficit of cases over the period in Irwindale relative to each comparison population, no measure differs from unity any more than chance would allow. Thus there is no evidence that the citizens of Irwindale are at unusually high (or unusually low) risk from cancer, overall or at any of

the four most common cancer sites.

This information is provided on behalf of the Los Angeles County Cancer Surveillance Program and the California Cancer Registry. We will be happy to respond to any questions that you or representatives of the city might have.

Thomas Mack MD, MPH
Professor, Preventive Medicine and Pathology

Wendy Cozen DO, MPH
Professor, Preventive Medicine and Pathology

Amie Hwang, Ph.D., MPH
Project Manager and Post-doctoral Fellow
Preventive Medicine

CC: Dennis Deapen, Dr.PH, Professor and Director, USC Cancer Surveillance Program
Cyllene Morris, D.V.M, Ph.D., Research Program Director, California Cancer Registry, California State Department of Health Services
Kurt Snipes, Ph.D., Director, California Cancer Registry, California State Department of Health Services

Appendix C

Irwindale Facility Emissions Reported to US EPA National Emissions Inventory

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
All American Asphalt		**6.01**
13646 Live Oak Ln. Irwindale, CA 91706		6.01
Alpha Investment Associates	**30.91**	**30.91**
2501 Bateman Irwindale, CA 91706	30.91	30.91
B & S Enterprises Inc.	**1.57**	**1.57**
1424 E. Arrow Hwy Irwindale, CA 91706	1.57	1.57
Barron Boats		**3.01**
5820 Martin Rd. Irwindale, CA 91706-6213		3.01
Baxter Healthcare Pharmaseal D	**14.12**	**14.12**
4401 Foxdale Ave. Irwindale, CA 91706	14.12	14.12
California Portland Cement Co.	**2.41E-05**	
13000 E. Los Angeles St. Irwindale, CA 91706	2.41E-05	
Calmat Company	**40.02**	**48.98**
16001 Foothill Blvd. Irwindale, CA 91706	2.48	2.48
16005 Foothill Blvd. Irwindale, CA 91706	6.62	15.58
Calmat Disposal Site: 15900 W. Foothill Blvd. Irwindale, CA 9170(	30.91	30.91
Chaparral Concrete Co. Baldwin Park Plant		**1.00E-06**
13000 E. Los Angeles St. Irwindale, CA 91706		1.00E-06
Davis Wire Corp.	**24.53**	**19.93**
5555 Irwindale Ave. Irwindale, CA 91706-2070	24.53	19.93
Famwoods Printing, Inc./Montage Press DB		**3.89**
12758 Schabarum Ave. Irwindale, CA 91706-0000		3.89
Hanson Aggregates West Inc./Irwindale Rock	**2.65**	**18.68**
13550 Live Oak Ave. Irwindale, CA 91706-1317	2.65	18.68
Holliday Trucking Co., Inc.		**0.05**
257 E. Longden Ave. Irwindale, CA 91706		0.05
Home Savings of America/Envir.	**3.63**	**3.63**
4900 Rivergrade Rd. Irwindale, CA 91706	3.63	3.63
Industrial Asphalt	**1.02**	**1.02**
13130 E. Los Angeles St. Irwindale, CA 91706	0.96	0.96
16005 Foothill Blvd. Irwindale, CA 91706	0.06	0.06
Livingston / Graham Irwindale Live Oak Ave.	**0.84**	**0.84**
13550 Live Oak Ave. E. Hwy 605 W Irwindale, CA 91706	0.84	0.84
Longden Ave. Disposal Site	**30.91**	**30.91**
E. Longden Ave. Irwindale, CA 91706	30.91	30.91
Manning Brothers Class III Landfill	**3.87**	**3.87**
16158 Central St. Irwindale, CA 91706	3.87	3.87
Marble Makers Inc.	**3.43**	**8.53**
2310 E. Central Ave. Irwindale, CA 91010	3.43	8.53
Miller Breweries West LP	**997.37**	**175.03**
15801 E. 1st St. Irwindale, CA 91706-2069	997.37	175.03
National Ready Mix Concrete Co.		**3.11E-03**
2620 Buena Vista St. Irwindale, CA 91706		3.11E-03

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Nu-Way Inc.	**30.91**	**33.30**
Live Oak Landfill: 13620 Live Oak Ln. Irwindale, CA 91706-0000		2.39
Owl Rock Site: East Live Oak Ave. Irwindale, CA	30.91	30.91
PTX Industries Inc.	**1.35**	**1.35**
5355 N. Vincent Ave. Irwindale, CA 91706	1.35	1.35
Robertson's Ready Mix	**3.41**	**3.41**
13646 Live Oak Ln. Irwindale, CA 91706	3.41	3.41
San Marino Landfill	**30.91**	**30.91**
212 E. Live Oak Ave. Irwindale, CA 91706	30.91	30.91
Sierra Alloys Co., Inc		**3.71**
5467 Ayon Ave. Irwindale, CA 91706-2044		3.71
Southwest Products Co.	**1.31**	**1.31**
2240 Buena Vista St. Irwindale, CA 91706	1.31	1.31
Specialty Organics Inc.	**3.28**	**3.28**
5263 N. 4th St. Irwindale, CA 91706	3.28	3.28
Standard Concrete Products Inc.		**0.90**
13550 Live Oak Ave. Irwindale, CA 91706-1317		0.90
Sully Miller Contracting Co.	**40.90**	**43.59**
1245 E. Arrow Hwy Irwindale, CA 91706-1302	24.76	33.06
2600 Buena Vista St. Irwindale, CA 91706-0000	16.15	10.53
TRW Sensor Operations	**1.19**	**1.19**
6010 N. Irwindale Ave. Irwindale, CA 91706	1.19	1.19
TRW Technar Inc.	**8.98**	**8.98**
5462 N. Irwindale Ave. Irwindale, CA 91706	8.98	8.98
United Rock Products Corp.	**1.99**	**26.11**
1245 E. Arrow Hwy Irwindale, CA 91706-1302	1.99	26.11
Wedgestone Automotive Corp.	**4.03**	**4.03**
15854 Ornelas Ave. Irwindale, CA 91706	4.03	4.03
Grand Total	**1283.15**	**533.07**

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
All American Asphalt		**6.01**
13646 Live Oak Ln. Irwindale, CA 91706		
2-Methylnaphthalene		1.04E-02
Acenaphthene		1.30E-04
Acenaphthylene		8.00E-05
Acetaldehyde		4.66E-02
Acrolein		1.00E-04
Ammonia		1.19E-01
Anthracene		3.00E-05
Arsenic		6.60E-05
Benz[a]Anthracene		6.81E-07
Benzene		1.89E-03
Benzo[a]Pyrene		4.74E-08
Benzo[b]Fluoranthene		1.38E-06
Benzo[g,h,i,]Perylene		7.30E-08
Benzo[k]Fluoranthene		1.90E-06
Beryllium		2.15E-04
Cadmium		8.54E-05
Carbon Monoxide		2.52E-01
Chromium (VI)		3.72E-06
Chrysene		5.64E-07
Dibenzo[a,h]Anthracene		1.39E-08
Ethyl Benzene		3.20E-01
Fluoranthene		2.00E-05
Fluorene		2.30E-04
Formaldehyde		7.65E-02
Hexane		1.70E-04
Indeno[1,2,3-c,d]Pyrene		4.37E-08
Lead		1.25E-04
Manganese		1.29E-03
Mercury		5.50E-05
Naphthalene		5.25E-03
Nickel		4.36E-04
Nitrogen Oxides		1.86E+00
Phenanthrene		3.75E-04
PM10-PRI		2.23E+00
PM25-PRI		3.74E-01
Pyrene		5.05E-06
Selenium		7.00E-05
Sulfur Dioxide		2.23E-02
Toluene		1.46E-01
Volatile Organic Compounds		1.43E-01
Xylenes (Mixture of o, m, and p Isomers)		3.93E-01

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Alpha Investment Associates	**30.91**	**30.91**
2501 Bateman Irwindale, CA 91706		
1,1,2,2-Tetrachloroethane	2.57E-01	2.57E-01
1,4-Dichlorobenzene	4.25E-02	4.25E-02
Acrylonitrile	4.63E-01	4.63E-01
Benzene	1.19E+00	1.19E+00
Carbon Disulfide	6.08E-02	6.08E-02
Carbon Tetrachloride	8.48E-04	8.48E-04
Carbonyl Sulfide	4.06E-02	4.06E-02
Chlorobenzene	3.88E-02	3.88E-02
Chloroform	4.94E-03	4.94E-03
Ethyl Benzene	6.74E-01	6.74E-01
Ethyl Chloride	1.11E-01	1.11E-01
Ethylene Dibromide	2.59E-04	2.59E-04
Ethylene Dichloride	5.59E-02	5.59E-02
Ethylidene Dichloride		3.20E-01
Ethylidene Dichloride (1,1-Dichloroethane)	3.20E-01	
Hexane	7.80E-01	7.80E-01
Mercury & Compounds	8.07E-05	8.07E-05
Methyl Chloride	8.42E-02	8.42E-02
Methyl Chloroform	8.82E-02	8.82E-02
Methyl Isobutyl Ketone	2.58E-01	2.58E-01
Methylene Chloride	1.67E+00	1.67E+00
Propylene Dichloride	2.80E-02	2.80E-02
Tetrachloroethylene	8.52E-01	8.52E-01
Toluene	2.09E+01	2.09E+01
Trichloroethylene	5.10E-01	5.10E-01
Vinyl Chloride	6.32E-01	6.32E-01
Vinylidene Chloride	2.67E-02	2.67E-02
Xylenes (Mixture of o, m, and p Isomers)	1.77E+00	1.77E+00
B & S Enterprises Inc.	**1.57**	**1.57**
1424 E. Arrow Hwy Irwindale, CA 91706		
Volatile Organic Compounds	1.57	1.57
Barron Boats		**3.01**
5820 Martin Rd. Irwindale, CA 91706-6213		
Volatile Organic Compounds		3.01

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Baxter Healthcare Pharmaseal D	**14.12**	**14.12**
4401 Foxdale Ave. Irwindale, CA 91706		
Ethylene Oxide	9.15E+00	9.15E+00
Formaldehyde	4.10E-02	4.10E-02
Methylene Chloride	4.93E+00	4.93E+00
Toluene	1.00E-03	1.00E-03
California Portland Cement Co.	**2.41E-05**	
13000 E. Los Angeles St. Irwindale, CA 91706		
Cadmium	2.88E-07	
Chromium (VI)	3.82E-06	
Chromium III	9.69E-06	
Lead Compounds (Inorganic)	3.90E-06	
Mercury	6.15E-08	
Nickel	6.35E-06	
Calmat Company	**40.02**	**48.98**
16001 Foothill Blvd. Irwindale, CA 91706		
PM10-PRI	1.48E+00	1.48E+00
PM25-PRI	1.00E+00	1.00E+00
16005 Foothill Blvd. Irwindale, CA 91706		
1,3-Butadiene		5.05E-04
Ammonia		1.07E+00
Arsenic		5.90E-07
Benzene		1.93E-03
Cadmium		5.55E-07
Carbon Monoxide	2.29E+00	3.96E+00
Chromium (VI)		3.70E-08
Formaldehyde		2.45E-03
Lead		3.07E-06
Naphthalene		8.50E-05
Nickel		2.98E-06
Nitrogen Oxides	2.91E+00	2.88E+00
PM10-PRI	4.54E-01	5.31E+00
PM25-PRI	4.54E-01	2.03E+00
Sulfur Dioxide	5.00E-02	4.08E-02
Volatile Organic Compounds	4.60E-01	2.98E-01
Calmat Disposal Site: 15900 W. Foothill Blvd. Irwindale, CA 91706		
1,1,2,2-Tetrachloroethane	2.57E-01	2.57E-01
1,4-Dichlorobenzene	4.25E-02	4.25E-02
Acrylonitrile	4.63E-01	4.63E-01
Benzene	1.19E+00	1.19E+00
Carbon Disulfide	6.08E-02	6.08E-02

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Calmat Company	**40.02**	**48.98**
Calmat Disposal Site: 15900 W. Foothill Blvd. Irwindale, CA 91706		
Carbon Tetrachloride	8.48E-04	8.48E-04
Carbonyl Sulfide	4.06E-02	4.06E-02
Chlorobenzene	3.88E-02	3.88E-02
Chloroform	4.94E-03	4.94E-03
Ethyl Benzene	6.74E-01	6.74E-01
Ethyl Chloride	1.11E-01	1.11E-01
Ethylene Dibromide	2.59E-04	2.59E-04
Ethylene Dichloride	5.59E-02	5.59E-02
Ethylidene Dichloride		3.20E-01
Ethylidene Dichloride (1,1-Dichloroethane)	3.20E-01	
Hexane	7.80E-01	7.80E-01
Mercury & Compounds	8.07E-05	8.07E-05
Methyl Chloride	8.42E-02	8.42E-02
Methyl Chloroform	8.82E-02	8.82E-02
Methyl Isobutyl Ketone	2.58E-01	2.58E-01
Methylene Chloride	1.67E+00	1.67E+00
Propylene Dichloride	2.80E-02	2.80E-02
Tetrachloroethylene	8.52E-01	8.52E-01
Toluene	2.09E+01	2.09E+01
Trichloroethylene	5.10E-01	5.10E-01
Vinyl Chloride	6.32E-01	6.32E-01
Vinylidene Chloride	2.67E-02	2.67E-02
Xylenes (Mixture of o, m, and p Isomers)	1.77E+00	1.77E+00
Chaparral Concrete Co. Baldwin Park Plant		**1.00E-06**
13000 E. Los Angeles St. Irwindale, CA 91706		
Lead & Compounds		1.00E-06

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Davis Wire Corp.	**24.53**	**19.93**
5555 Irwindale Ave. Irwindale, CA 91706-2070		
1,3-Butadiene		5.00E-06
Ammonia		1.60E+00
Arsenic		4.00E-08
Benzene	8.40E-04	5.80E-04
Cadmium		3.75E-08
Carbon Monoxide	5.43E+00	3.82E+00
Chromium (VI)		2.50E-09
Formaldehyde	1.79E-03	1.30E-03
Hydrochloric Acid	7.68E-01	
Lead		2.08E-07
Naphthalene		2.60E-05
Nickel		9.75E-08
Nitrogen Oxides	1.24E+01	1.27E+01
PM10-PRI	1.17E+00	7.95E-01
PM25-PRI	1.11E+00	6.68E-01
Sulfur Dioxide	9.00E-02	5.34E-02
Toluene	3.85E-03	
Volatile Organic Compounds	3.58E+00	2.54E-01
Xylenes (Mixture of o, m, and p Isomers)	2.86E-03	
Famwoods Printing, Inc./Montage Press DB		**3.89**
12758 Schabarum Ave. Irwindale, CA 91706-0000		
Ammonia		5.35E-01
Volatile Organic Compounds		3.35E+00

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Hanson Aggregates West Inc./Irwindale Rock	**2.65**	**18.68**
13550 Live Oak Ave. Irwindale, CA 91706-1317		
1,3-Butadiene		2.22E-03
Ammonia		1.40E-03
Arsenic		4.82E-05
Benzene		8.20E-03
Beryllium		2.16E-06
Cadmium		4.17E-06
Carbon Monoxide		8.06E+00
Chromium (VI)		1.72E-06
Formaldehyde		9.92E-03
Lead		1.11E-04
Naphthalene		3.15E-04
Nickel		1.04E-04
Nitrogen Oxides		1.03E+00
PM10-PRI	1.80E+00	7.80E+00
PM25-PRI	5.41E-01	1.24E+00
Sulfur Dioxide		2.30E-02
Volatile Organic Compounds	3.10E-01	5.18E-01
Holliday Trucking Co., Inc.		**0.05**
257 E. Longden Ave. Irwindale, CA 91706		
Ammonia		7.50E-04
Arsenic		1.08E-06
Benzene		3.19E-06
Beryllium		9.50E-08
Cadmium		1.08E-06
Carbon Monoxide		8.23E-03
Chromium (VI)		1.27E-09
Formaldehyde		3.35E-04
Lead		5.25E-07
Naphthalene		7.05E-08
Nickel		1.02E-06
Nitrogen Oxides		1.60E-02
PM10-PRI		5.06E-03
PM25-PRI		3.57E-03
Sulfur Dioxide		1.40E-04
Volatile Organic Compounds		1.39E-02

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Home Savings of America/Envir.	**3.63**	**3.63**
4900 Rivergrade Rd. Irwindale, CA 91706		
Carbon Monoxide	2.90E-01	2.90E-01
Nitrogen Oxides	1.16E+00	1.16E+00
PM10-PRI	4.49E-02	4.49E-02
PM25-PRI	4.45E-02	4.45E-02
Sulfur Dioxide	1.00E-02	1.00E-02
Volatile Organic Compounds	2.09E+00	2.09E+00
Industrial Asphalt	**1.02**	**1.02**
13130 E. Los Angeles St. Irwindale, CA 91706		
Benzo[b]Fluoranthene	1.15E-05	
Benzo[k]Fluoranthene	4.98E-06	
Cadmium	8.20E-05	8.20E-05
Dioxins, Total, W/O Individ. Isomers Reported {PCDDS}		2.60E-09
Formaldehyde	4.61E-01	4.61E-01
Lead	4.13E-04	4.13E-04
Manganese	4.55E-01	4.55E-01
Mercury	1.95E-06	1.95E-06
Methyl Chloroform	8.70E-03	8.70E-03
Naphthalene	2.45E-03	2.45E-03
PAH, total	3.50E-03	3.50E-03
Polychlorinated Dibenzofurans, Total		3.93E-10
Radionuclides	5.10E-08	
Radionuclides (Including Radon)		5.10E-08
Toluene	3.07E-02	3.07E-02
16005 Foothill Blvd. Irwindale, CA 91706		
Acetaldehyde	1.35E-02	1.35E-02
Benzene	4.00E-03	4.00E-03
Formaldehyde	9.50E-03	9.50E-03
Lead	2.50E-03	2.50E-03
Manganese	1.00E-03	1.00E-03
Mercury	2.00E-03	2.00E-03
Methyl Chloroform	5.00E-04	5.00E-04
Naphthalene	6.00E-03	6.00E-03
Nickel	5.00E-04	5.00E-04
Toluene	1.20E-02	1.20E-02
Xylenes (Mixture of o, m, and p Isomers)	1.15E-02	1.15E-02

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Livingston / Graham Irwindale Live Oak Ave.	**0.84**	**0.84**
13550 Live Oak Ave. E. Hwy 605 W Irwindale, CA 91706		
1,1,2,2-Tetrachloroethane	6.96E-03	6.96E-03
1,4-Dichlorobenzene	1.15E-03	1.15E-03
Acrylonitrile	1.26E-02	1.26E-02
Benzene	3.24E-02	3.24E-02
Carbon Disulfide	1.65E-03	1.65E-03
Carbon Tetrachloride	2.30E-05	2.30E-05
Carbonyl Sulfide	1.10E-03	1.10E-03
Chlorobenzene	1.05E-03	1.05E-03
Chloroform	1.34E-04	1.34E-04
Ethyl Benzene	1.83E-02	1.83E-02
Ethyl Chloride	3.01E-03	3.01E-03
Ethylene Dibromide	7.02E-06	7.02E-06
Ethylene Dichloride	1.52E-03	1.52E-03
Ethylidene Dichloride		8.69E-03
Ethylidene Dichloride (1,1-Dichloroethane)	8.69E-03	
Hexane	2.12E-02	2.12E-02
Mercury & Compounds	2.19E-06	2.19E-06
Methyl Chloride	2.28E-03	2.28E-03
Methyl Chloroform	2.39E-03	2.39E-03
Methyl Isobutyl Ketone	7.00E-03	7.00E-03
Methylene Chloride	4.54E-02	4.54E-02
Propylene Dichloride	7.60E-04	7.60E-04
Tetrachloroethylene	2.31E-02	2.31E-02
Toluene	5.68E-01	5.68E-01
Trichloroethylene	1.38E-02	1.38E-02
Vinyl Chloride	1.71E-02	1.71E-02
Vinylidene Chloride	7.25E-04	7.25E-04
Xylenes (Mixture of o, m, and p Isomers)	4.80E-02	4.80E-02

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Longden Ave. Disposal Site	**30.91**	**30.91**
E. Longden Ave. Irwindale, CA 91706		
1,1,2,2-Tetrachloroethane	2.57E-01	2.57E-01
1,4-Dichlorobenzene	4.25E-02	4.25E-02
Acrylonitrile	4.63E-01	4.63E-01
Benzene	1.19E+00	1.19E+00
Carbon Disulfide	6.08E-02	6.08E-02
Carbon Tetrachloride	8.48E-04	8.48E-04
Carbonyl Sulfide	4.06E-02	4.06E-02
Chlorobenzene	3.88E-02	3.88E-02
Chloroform	4.94E-03	4.94E-03
Ethyl Benzene	6.74E-01	6.74E-01
Ethyl Chloride	1.11E-01	1.11E-01
Ethylene Dibromide	2.59E-04	2.59E-04
Ethylene Dichloride	5.59E-02	5.59E-02
Ethylidene Dichloride		3.20E-01
Ethylidene Dichloride (1,1-Dichloroethane)	3.20E-01	
Hexane	7.80E-01	7.80E-01
Mercury & Compounds	8.07E-05	8.07E-05
Methyl Chloride	8.42E-02	8.42E-02
Methyl Chloroform	8.82E-02	8.82E-02
Methyl Isobutyl Ketone	2.58E-01	2.58E-01
Methylene Chloride	1.67E+00	1.67E+00
Propylene Dichloride	2.80E-02	2.80E-02
Tetrachloroethylene	8.52E-01	8.52E-01
Toluene	2.09E+01	2.09E+01
Trichloroethylene	5.10E-01	5.10E-01
Vinyl Chloride	6.32E-01	6.32E-01
Vinylidene Chloride	2.67E-02	2.67E-02
Xylenes (Mixture of o, m, and p Isomers)	1.77E+00	1.77E+00

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Manning Brothers Class III Landfill	**3.87**	**3.87**
16158 Central St. Irwindale, CA 91706		
1,1,2,2-Tetrachloroethane	3.21E-02	3.21E-02
1,4-Dichlorobenzene	5.32E-03	5.32E-03
Acrylonitrile	5.79E-02	5.79E-02
Benzene	1.49E-01	1.49E-01
Carbon Disulfide	7.61E-03	7.61E-03
Carbon Tetrachloride	1.06E-04	1.06E-04
Carbonyl Sulfide	5.07E-03	5.07E-03
Chlorobenzene	4.85E-03	4.85E-03
Chloroform	6.17E-04	6.17E-04
Ethyl Benzene	8.43E-02	8.43E-02
Ethyl Chloride	1.39E-02	1.39E-02
Ethylene Dibromide	3.24E-05	3.24E-05
Ethylene Dichloride	6.99E-03	6.99E-03
Ethylidene Dichloride		4.01E-02
Ethylidene Dichloride (1,1-Dichloroethane)	4.01E-02	
Hexane	9.75E-02	9.75E-02
Mercury & Compounds	1.01E-05	1.01E-05
Methyl Chloride	1.05E-02	1.05E-02
Methyl Chloroform	1.10E-02	1.10E-02
Methyl Isobutyl Ketone	3.23E-02	3.23E-02
Methylene Chloride	2.09E-01	2.09E-01
Propylene Dichloride	3.50E-03	3.50E-03
Tetrachloroethylene	1.07E-01	1.07E-01
Toluene	2.62E+00	2.62E+00
Trichloroethylene	6.38E-02	6.38E-02
Vinyl Chloride	7.90E-02	7.90E-02
Vinylidene Chloride	3.34E-03	3.34E-03
Xylenes (Mixture of o, m, and p Isomers)	2.21E-01	2.21E-01
Marble Makers Inc.	**3.43**	**8.53**
2310 E. Central Ave. Irwindale, CA 91010		
Styrene		5.10
Volatile Organic Compounds	3.43	3.43

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Miller Breweries West LP	**997.37**	**175.03**
15801 E. 1st St. Irwindale, CA 91706-2069		
1,3-Butadiene		9.39E-03
Acetaldehyde	1.59E-01	
Acrolein	3.31E-03	
Ammonia	4.96E+00	1.24E+01
Arsenic		5.35E-07
Benzene	4.69E-03	2.60E-02
Cadmium		5.00E-07
Carbon Monoxide	8.45E+02	3.97E+01
Carbon Tetrachloride		2.45E-04
Chlorine	8.31E-01	
Chromium (VI)		3.35E-08
Ethylene Dibromide		2.95E-04
Ethylene Dichloride		1.55E-04
Fluoranthene	1.32E-08	
Fluorene	1.24E-08	
Formaldehyde	3.31E-04	4.85E-01
Glycol Ethers	1.43E-01	
Lead		2.78E-06
Methanol	1.65E+00	
Methylene Chloride		5.70E-04
Naphthalene	4.51E-02	1.75E-03
Nickel		1.31E-06
Nitrogen Oxides	1.49E+01	8.70E+00
PAH, total	4.97E-02	
Phenanthrene	7.51E-08	
Phosphine	1.74E-02	
PM10-PRI	6.96E-01	9.19E-01
PM25-PRI	5.97E-01	9.19E-01
Pyrene	2.21E-08	
Sulfur Dioxide	1.70E-01	7.56E-02
Vinyl Chloride		9.50E-05
Volatile Organic Compounds	1.28E+02	1.12E+02
National Ready Mix Concrete Co.		**3.11E-03**
2620 Buena Vista St. Irwindale, CA 91706		
Lead & Compounds		2.50E-03
Mercury & Compounds		6.05E-04

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Nu-Way Inc.	**30.91**	**33.30**
Live Oak Landfill: 13620 Live Oak Ln. Irwindale, CA 91706-0000		
1,3-Butadiene		2.00E-05
Ammonia		3.15E-04
Arsenic		1.76E-07
Benzene		2.00E-05
Cadmium		1.65E-07
Carbon Monoxide		1.12E-02
Chromium (VI)		1.10E-08
Formaldehyde		1.85E-04
Lead		9.15E-07
Naphthalene		2.17E-06
Nickel		4.29E-07
Nitrogen Oxides		5.16E-02
PM10-PRI		1.38E+00
PM25-PRI		9.43E-01
Sulfur Dioxide		7.80E-04
Volatile Organic Compounds		3.85E-03
Owl Rock Site: East Live Oak Ave. Irwindale, CA		
1,1,2,2-Tetrachloroethane	2.57E-01	2.57E-01
1,4-Dichlorobenzene	4.25E-02	4.25E-02
Acrylonitrile	4.63E-01	4.63E-01
Benzene	1.19E+00	1.19E+00
Carbon Disulfide	6.08E-02	6.08E-02
Carbon Tetrachloride	8.48E-04	8.48E-04
Carbonyl Sulfide	4.06E-02	4.06E-02
Chlorobenzene	3.88E-02	3.88E-02
Chloroform	4.94E-03	4.94E-03
Ethyl Benzene	6.74E-01	6.74E-01
Ethyl Chloride	1.11E-01	1.11E-01
Ethylene Dibromide	2.59E-04	2.59E-04
Ethylene Dichloride	5.59E-02	5.59E-02
Ethylidene Dichloride		3.20E-01
Ethylidene Dichloride (1,1-Dichloroethane)	3.20E-01	
Hexane	7.80E-01	7.80E-01
Mercury & Compounds	8.07E-05	8.07E-05
Methyl Chloride	8.42E-02	8.42E-02
Methyl Chloroform	8.82E-02	8.82E-02
Methyl Isobutyl Ketone	2.58E-01	2.58E-01
Methylene Chloride	1.67E+00	1.67E+00
Propylene Dichloride	2.80E-02	2.80E-02
Tetrachloroethylene	8.52E-01	8.52E-01
Toluene	2.09E+01	2.09E+01

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Nu-Way Inc.	**30.91**	**33.30**
Owl Rock Site: East Live Oak Ave. Irwindale, CA		
Trichloroethylene	5.10E-01	5.10E-01
Vinyl Chloride	6.32E-01	6.32E-01
Vinylidene Chloride	2.67E-02	2.67E-02
Xylenes (Mixture of o, m, and p Isomers)	1.77E+00	1.77E+00
PTX Industries Inc.	**1.35**	**1.35**
5355 N. Vincent Ave. Irwindale, CA 91706		
Carbon Monoxide	2.60E-01	2.60E-01
Nitrogen Oxides	9.20E-01	9.20E-01
PM10-PRI	5.64E-02	5.64E-02
PM25-PRI	4.49E-02	4.49E-02
Sulfur Dioxide	2.00E-02	2.00E-02
Volatile Organic Compounds	5.00E-02	5.00E-02
Robertson's Ready Mix	**3.41**	**3.41**
13646 Live Oak Ln. Irwindale, CA 91706		
Carbon Monoxide	1.25E+00	1.25E+00
Nitrogen Oxides	1.30E+00	1.30E+00
PM10-PRI	3.09E-01	3.09E-01
PM25-PRI	2.68E-01	2.68E-01
Sulfur Dioxide	3.00E-02	3.00E-02
Volatile Organic Compounds	2.49E-01	2.49E-01

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
San Marino Landfill	**30.91**	**30.91**
212 E. Live Oak Ave. Irwindale, CA 91706		
1,1,2,2-Tetrachloroethane	2.57E-01	2.57E-01
1,4-Dichlorobenzene	4.25E-02	4.25E-02
Acrylonitrile	4.63E-01	4.63E-01
Benzene	1.19E+00	1.19E+00
Carbon Disulfide	6.08E-02	6.08E-02
Carbon Tetrachloride	8.48E-04	8.48E-04
Carbonyl Sulfide	4.06E-02	4.06E-02
Chlorobenzene	3.88E-02	3.88E-02
Chloroform	4.94E-03	4.94E-03
Ethyl Benzene	6.74E-01	6.74E-01
Ethyl Chloride	1.11E-01	1.11E-01
Ethylene Dibromide	2.59E-04	2.59E-04
Ethylene Dichloride	5.59E-02	5.59E-02
Ethylidene Dichloride		3.20E-01
Ethylidene Dichloride (1,1-Dichloroethane)	3.20E-01	
Hexane	7.80E-01	7.80E-01
Mercury & Compounds	8.07E-05	8.07E-05
Methyl Chloride	8.42E-02	8.42E-02
Methyl Chloroform	8.82E-02	8.82E-02
Methyl Isobutyl Ketone	2.58E-01	2.58E-01
Methylene Chloride	1.67E+00	1.67E+00
Propylene Dichloride	2.80E-02	2.80E-02
Tetrachloroethylene	8.52E-01	8.52E-01
Toluene	2.09E+01	2.09E+01
Trichloroethylene	5.10E-01	5.10E-01
Vinyl Chloride	6.32E-01	6.32E-01
Vinylidene Chloride	2.67E-02	2.67E-02
Xylenes (Mixture of o, m, and p Isomers)	1.77E+00	1.77E+00
Sierra Alloys Co., Inc		**3.71**
5467 Ayon Ave. Irwindale, CA 91706-2044		
Ammonia		3.31E-01
Benzene		1.45E-04
Carbon Monoxide		6.43E-01
Formaldehyde		3.10E-04
Naphthalene		5.00E-06
Nitrogen Oxides		2.39E+00
PM10-PRI		1.38E-01
PM25-PRI		1.38E-01
Sulfur Dioxide		1.10E-02
Volatile Organic Compounds		5.45E-02

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Southwest Products Co.	**1.31**	**1.31**
2240 Buena Vista St. Irwindale, CA 91706		
Methyl Chloroform	1.29E+00	1.29E+00
p-Dioxane	2.71E-02	2.71E-02
Specialty Organics Inc.	**3.28**	**3.28**
5263 N. 4th St. Irwindale, CA 91706		
Toluene	3.28	3.28
Standard Concrete Products Inc.		**0.90**
13550 Live Oak Ave. Irwindale, CA 91706-1317		
Arsenic		2.00E-05
Beryllium		1.87E-06
Cadmium		1.94E-07
Chromium (VI)		6.35E-08
Lead		2.50E-05
Manganese		4.15E-04
Mercury		6.35E-08
Nickel		8.00E-05
PM10-PRI		5.40E-01
PM25-PRI		3.64E-01
Selenium		2.10E-06

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Sully Miller Contracting Co.	**40.90**	**43.59**
1245 E. Arrow Hwy Irwindale, CA 91706-1302		
2-Methylnaphthalene		8.65E-03
Acenaphthene		1.10E-04
Acenaphthylene		7.07E-05
Acetaldehyde		3.88E-02
Acrolein		3.50E-05
Ammonia		1.27E-01
Anthracene		2.66E-05
Arsenic	7.77E-05	5.57E-05
B[j]Fluoranthene		1.00E-05
Benz[a]Anthracene		9.89E-07
Benzene	4.99E-02	1.59E-03
Benzo[a]Pyrene		9.17E-08
Benzo[b]Fluoranthene		1.32E-06
Benzo[e]Pyrene		1.72E-07
Benzo[g,h,i,]Perylene		1.03E-07
Benzo[k]Fluoranthene		1.64E-06
Beryllium	1.17E-04	1.51E-05
Cadmium	7.08E-04	7.01E-05
Carbon Monoxide	2.35E+00	2.66E+01
Chromium (VI)	6.75E-05	2.66E-07
Chrysene		2.74E-06
Dibenzo[a,h]Anthracene		1.96E-08
Ethyl Benzene		2.67E-01
Fluoranthene		1.62E-05
Fluorene		2.05E-04
Formaldehyde	1.49E-01	6.36E-02
Hexane		9.50E-05
Indeno[1,2,3-c,d]Pyrene		4.66E-08
Lead	4.03E-04	1.07E-04
Manganese	4.66E-03	9.15E-04
Mercury	5.46E-03	4.50E-05
Naphthalene		4.39E-03
Nickel	7.71E-04	3.63E-04
Nitrogen Oxides	6.81E+00	2.18E+00
PAH, total	3.75E-06	
Perylene		4.83E-07
Phenanthrene		3.30E-04
PM10-PRI	7.15E+00	2.61E+00
PM25-PRI	7.00E+00	4.35E-01
Pyrene		8.37E-06
Selenium	7.77E-05	5.51E-05

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Sully Miller Contracting Co.	**40.90**	**43.59**
1245 E. Arrow Hwy Irwindale, CA 91706-1302		
Styrene		1.96E-06
Sulfur Dioxide	4.00E-02	2.38E-02
Toluene		1.21E-01
Volatile Organic Compounds	1.19E+00	3.01E-01
Xylenes (Mixture of o, m, and p Isomers)		3.27E-01
2600 Buena Vista St. Irwindale, CA 91706-0000		
1,3-Butadiene		3.00E-05
2-Methylnaphthalene		1.05E-02
Acenaphthene		2.05E-04
Acenaphthylene		1.21E-03
Acetaldehyde		4.50E-05
Acrolein		2.00E-05
Ammonia		7.55E-02
Anthracene		3.40E-05
Arsenic		7.64E-05
Benz[a]Anthracene		2.65E-05
Benzene	4.87E-03	3.13E-03
Benzo[a]Pyrene		1.43E-06
Benzo[b]Fluoranthene		1.02E-05
Benzo[e]Pyrene		1.54E-05
Benzo[g,h,i,]Perylene		5.05E-06
Benzo[k]Fluoranthene		5.07E-06
Beryllium		1.58E-07
Cadmium		5.52E-05
Carbon Monoxide	2.27E+00	4.65E+00
Chlorine		1.50E-05
Chromium (VI)		5.07E-06
Chrysene		3.12E-05
Dibenzo[a,h]Anthracene		8.85E-09
Ethyl Benzene		3.38E-02
Fluoranthene		8.89E-05
Fluorene		5.60E-04
Formaldehyde		7.42E-02
Hexane		1.29E-01
Indeno[1,2,3-c,d]Pyrene		9.91E-07
Lead		8.87E-05
Manganese	3.48E-03	1.40E-03
Mercury	1.12E-04	3.00E-05
Methanol		2.50E-05
Methyl Chloroform		6.75E-03
Methyl Tert-Butyl Ether		7.00E-05

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
Sully Miller Contracting Co.	**40.90**	**43.59**
2600 Buena Vista St. Irwindale, CA 91706-0000		
Methylene Chloride		2.32E-07
m-Xylene		1.70E-04
Naphthalene	1.21E-01	1.27E-02
Nickel	2.18E-03	1.32E-03
Nitrogen Oxides	2.65E+00	1.78E+00
o-Xylene		6.00E-05
PAH, total	2.92E-03	
Perylene		2.30E-06
Phenanthrene		1.11E-03
PM10-PRI	4.92E+00	2.52E+00
PM25-PRI	4.79E+00	5.15E-01
Pyrene		8.37E-05
Selenium		4.52E-05
Styrene		9.83E-06
Sulfur Dioxide	4.00E-02	1.45E-02
Toluene		2.14E-02
Volatile Organic Compounds	1.34E+00	6.52E-01
Xylenes (Mixture of o, m, and p Isomers)		2.84E-02
TRW Sensor Operations	**1.19**	**1.19**
6010 N. Irwindale Ave. Irwindale, CA 91706		
Chlorine	2.50E-03	2.50E-03
Lead	6.50E-03	6.50E-03
Methanol	5.48E-01	5.48E-01
Methyl Chloroform	6.32E-01	6.32E-01
TRW Technar Inc.	**8.98**	**8.98**
5462 N. Irwindale Ave. Irwindale, CA 91706		
1-Chloro-2,3-Epoxypropane	1.30E-01	
Beryllium	8.04E-01	8.04E-01
Cadmium	7.50E-03	7.50E-03
Chlorine	2.50E-03	2.50E-03
Epichlorohydrin		1.30E-01
Hydrochloric Acid	5.88E+00	5.88E+00
Lead	3.00E-01	3.00E-01
Methanol	6.68E-01	6.68E-01
Methyl Chloroform	1.82E-01	1.82E-01
Methylene Chloride	1.73E-01	1.73E-01
Nickel	8.04E-01	8.04E-01
Xylenes (Mixture of o, m, and p Isomers)	3.06E-02	3.06E-02

Facility Name Reported to NEI	Reported Emissions (Tons/Year): 2002	Reported Emissions (Tons/Year): 2005
United Rock Products Corp.	**1.99**	**26.11**
1245 E. Arrow Hwy Irwindale, CA 91706-1302		
1,3-Butadiene		5.15E-03
Ammonia		3.17E-03
Arsenic		2.08E-05
Benzene		1.89E-02
Beryllium		2.09E-06
Cadmium		7.34E-06
Carbon Monoxide		1.88E+01
Chromium (VI)		1.29E-06
Formaldehyde		2.30E-02
Lead		7.71E-05
Naphthalene		7.45E-04
Nickel		1.01E-04
Nitrogen Oxides		2.33E+00
PM10-PRI	1.46E+00	3.20E+00
PM25-PRI	4.37E-01	6.21E-01
Sulfur Dioxide		5.29E-02
Volatile Organic Compounds	1.00E-01	1.06E+00
Wedgestone Automotive Corp.	**4.03**	**4.03**
15854 Ornelas Ave. Irwindale, CA 91706		
Carbon Monoxide	1.23E+00	1.23E+00
Nitrogen Oxides	1.79E+00	1.79E+00
PM10-PRI	7.41E-02	7.41E-02
PM25-PRI	7.41E-02	7.41E-02
Volatile Organic Compounds	8.60E-01	8.60E-01
Grand Total	**1283.15**	**533.07**

Appendix D
Biological Letter

Merkel & Associates, Inc.
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30 October 2009
M&A #09-117-01

Ms. Elizabeth Meyerhoff
Environmental Planner
HCG, LLC / HMCG
2810 Cazadero Drive
Carlsbad, CA 92009

Biological Impact Analysis Letter Report
Irwindale Materials Recovery Facility and Transfer Station Project

Dear Ms. Elizabeth Meyerhoff:

Merkel & Associates, Inc. biologist, Edward L. Ervin, has prepared the following biological resource letter report for the Irwindale Materials Recovery Facility and Transfer Station Project. If you have any questions concerning this biological report, please do not hesitate to contact me at (858) 560-5465 or eervin@merkelinc.com.

Sincerely,

Edward L. Ervin
Project Manager/Associate Biologist

Keith W. Merkel
Principal Consultant

SUMMARY OF FINDINGS

Merkel & Associates, Inc. (M&A) has prepared this biological impact analysis report for the proposed Irwindale Materials Recovery Facility and Transfer Station Project. The purpose of this report is to document the biological conditions within the project study area; identify potential impacts to biological resources that could result from implementation of the project; and recommend measures to avoid, minimize, and/or mitigate significant impacts consistent with the California Environmental Quality Act (CEQA) and all applicable federal, state, and local rules and regulations.

The approximate 17.2-acre project site (Assessors Parcel Number, 8535-001-911) is located east of Interstate 605, south of the Santa Fe Flood Control Basin and immediately south of Arrow Highway and north of Live Oak Avenue. The proposed project is the construction of a materials recovery facility and transfer station, along with a fueling facility/convenience store that would be open to the public.

Although the area of the project property is currently located below the Santa Fe Flood Control Basin and out of the channelized San Gabriel River drainage system, it was historically part of the large alluvial fan formed at the based of the San Gabriel Mountains. The property has experienced long-term soil disturbance activities such as mechanical grading and mixing, which would have destroyed any natural soil horizons. Currently, the property is graded flat with about eight small piles of cobble-small boulders, two minor locations with cement slabs, and two Southern California Edison transmission line towers. The majority of the site includes non-native grassland, as well as non-native vegetation and disturbed habitat.

No special status floral and faunal species, or jurisdictional wetland or waterways were identified on or adjacent to the project site during the biological survey.

The proposed project would result in permanent, direct impacts to the vegetation on the entire project site through permanent loss of these resources by conversion of the land to industrial/business. Although the non-native grassland on-site does provide some biological value, the habitat is not considered to be a sensitive habitat type under CEQA and does not provide a critical linkage to other areas of native habitat; therefore, project impacts to non-native grassland would not be significant under CEQA, and no habitat based mitigation would be required.

Since some resident and/or migratory avian species have a potential to nest in the grassland and non-native trees onsite, project construction could result in "take" of these species under the federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Codes §3503 and

§3513; therefore, all grading and construction activities undertaken for the project shall comply with the regulatory requirements of the federal MBTA and California Fish and Game Codes §3503 and §3513.

INTRODUCTION

Purpose of the Report

Merkel & Associates, Inc. (M&A) has prepared this biological impact analysis report for the proposed Irwindale Materials Recovery Facility and Transfer Station Project. The purpose of this report is to document the existing biological conditions within the project study area; identify potential impacts to biological resources that could result from implementation of the project; and recommend measures to avoid, minimize, and/or mitigate significant impacts consistent with the California Environmental Quality Act (CEQA) and all applicable federal, state, and local rules and regulations.

Project Location

The 17.2-acre project site (Assessors Parcel Number 8535-001-911) is located within unsectioned lands, Township 1 South, Range 10 West of the San Bernardino Base and Meridian; U.S. Geological Survey Baldwin Park, California Quadrangle (Figure 1).

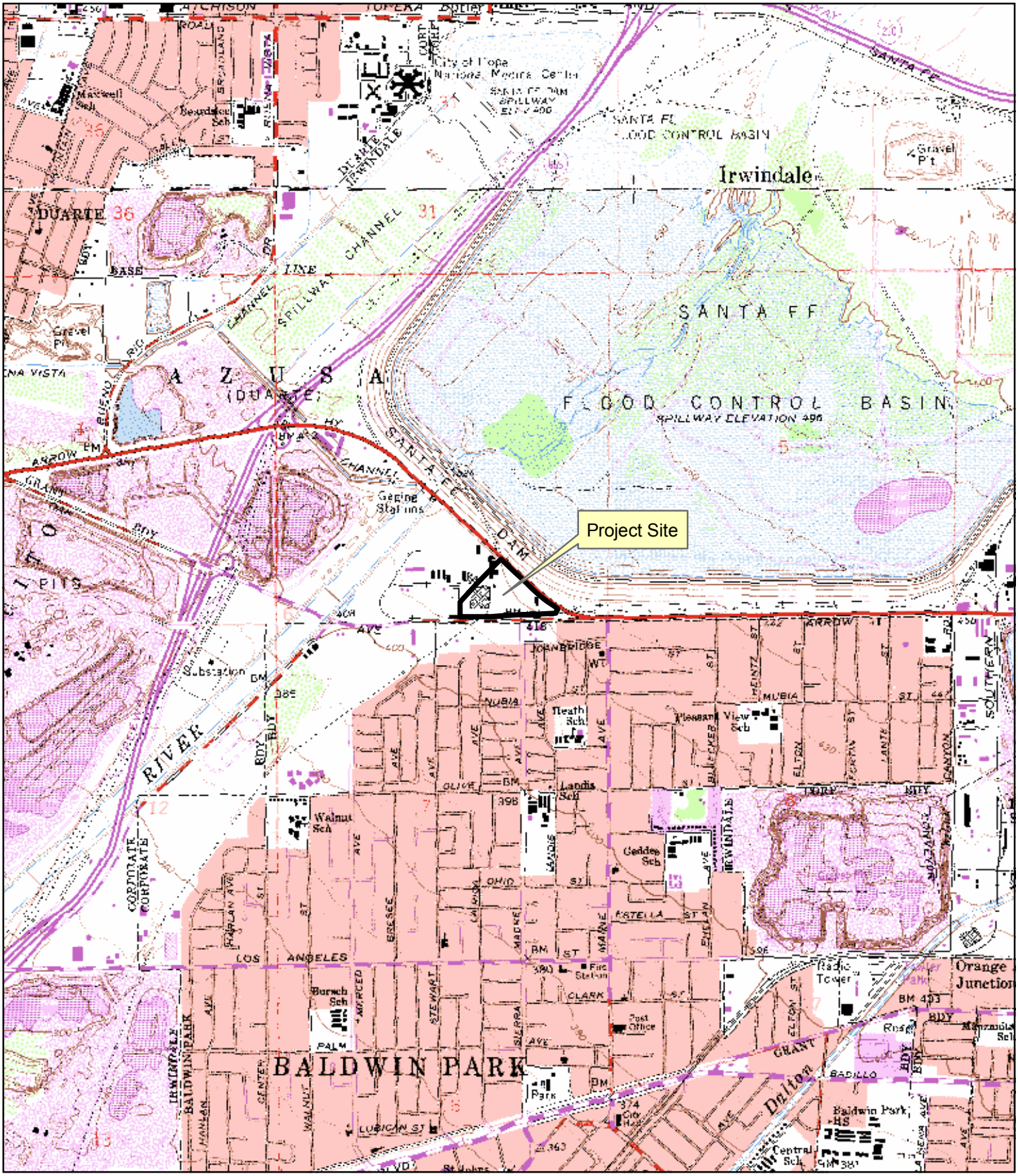
Project Description

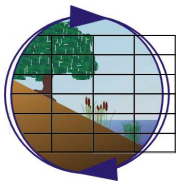
Athens Services proposes to construct a materials recovery facility and transfer station on the project site, along with a fueling facility/convenience store that would be open to the public. The material recovery facility and transfer station would include the majority of the building development totaling approximately 320,000 square-feet of the project site. The fueling area/convenience store would be a separate structure totaling approximately 3,000 square-feet located on the eastern portion of the project site.

METHODS

Literature and Data Review

Historical and currently available biological literature and data pertaining to the project area were reviewed prior to initiation of the field investigation. This review included examination of: 1) geological substrates and soil types mapped on the project site (Morton and Miller 2003 and USDA 1969, respectively); 2) National Wetland Inventory (NWI) maps of the project region





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Project Vicinity Map

Irwindale Materials Recovery Facility
and Transfer Station Project
Source: USGS 7.5' Baldwin Park, CA Quadrangle

Figure 1

(USFWS 1985); 3) federally designated critical habitat for the project region (USFWS 2009b); 4) California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB) and U.S. Fish and Wildlife Service (USFWS) special status species records for the project vicinity (CDFG 2009d and USFWS, respectively); and 5) the biological constraints analysis report prepared by BonTerra Consulting for a portion of the site, dated June 9, 2009.

Survey Conducted

General Biological Survey

M&A conducted a general biological survey of the entire project site on-foot. Existing vegetation types were delineated onto a 1" = 117' scale, color aerial photograph (Air Photo USA 2007) with topographical overlay of the project site. The vegetation types were classified according to the Holland (1986) code classification system.

A list of detectable flora and fauna species was recorded in a field notebook. Plant identifications were either resolved in the field or later determined through verification of voucher specimens, and wildlife species were determined through direct observation (aided by binoculars), identification of songs, call notes and alarm calls, or by detection of sign (e.g., burrows, tracks, scat, etc.).

In addition, a directed search for special status species on the project site was conducted. The potential for sensitive species to occur on the project site, but not identified during the survey, was assessed based on the existing biological conditions, as well as historical and currently available species data.

The scientific and common names utilized for the floral and faunal resources were noted according to the following nomenclature: flora, Baldwin et al. (2008); birds, American Ornithologists' Union (1998 and 2008); and mammals, (species level) Wilson and Reeder (2005) and (sub-species level) Hall (1981).

Photographs of the project area were taken to record the biological resources present within the study area, and data collected from the survey were digitized into current Geographical Information System (GIS) Environmental Systems Research Institute (ESRI) software platforms.

Burrowing Owl Habitat Assessment/Burrow Survey

M&A conducted a habitat assessment/burrow survey for the burrowing owl (*Athene cunicularia*), which is designated as a California special concern species by the CDFG, according to the most recent guidelines used by the CDFG, as noted in the *Burrowing Owl Survey Protocol and Mitigation Guidelines, prepared by the California Burrowing Owl Consortium in April 1993.* The assessment consisted of searching for the presence of potential natural or artificial burrows (culverts, debris piles, storm drains, etc.) by walking transects through potentially suitable habitat on the project site and areas within 150 meters (approximately 500 feet) of the proposed project impact zone to allow 100 percent visual coverage of the ground surface. The entire project site was surveyed on-foot; the portions of the study area that extended beyond the project site were visually surveyed only from the property boundary lines or areas of public access.

Survey Date(s), Time(s), and Conditions

Table 1 summarizes the survey date, time, and conditions.

Table 1. Survey Information

Survey	Date	Time	Conditions (start to end)	Biologist
General biology	26 Oct 2009	0625 - 0915	Weather: 0%-0% cc Wind: 1-1 BS Temperature: 66°-74° F	Edward L. Ervin

cc = cloud cover; BS = Beaufort scale; F = Fahrenheit

Survey Limitations

Biological inventories are generally subject to various survey limitations. Depending on the season and time of day during which field surveys are conducted, some species of annual plants, invertebrates, amphibians, reptiles, birds, and mammals may not be detected due to temporal species variability. All portions of the project site were accessible during the biological survey. Permission to access the City-owned land was granted by the City of Irwindale. Some annual plants, migratory or nesting birds, and crepuscular or nocturnal wildlife may not have been detected during the biological survey; however, based on the biological literature and data review performed, as well as knowledge of species-specific habitat requirements, it is anticipated that any additional species potentially present on the project site can be fairly accurately predicted,

and that the survey conducted was sufficient in obtaining a thorough review of the biological resources present on the project site.

EXISTING BIOLOGICAL CONDITIONS

Regional Context and General Physiography

The project site not located within federally designated critical habitat.

The project property is generally situated between Arrow Highway and Live Oak Avenue, in the shape of a triangle, with light industrial operations and facilities to its northwest and south, and the Santa Fe Flood Control Basin to the northeast. One block south of the light industry along the southern boundary of the project property are residential areas.

The topography of the project site is relatively flat with a consistent dip to the southwest. The surface texture is rough with an abundance of cobble, rock, small boulders, and striations created by periodic vegetation clearing activities from soil ripping. No water conveyance features carrying runoff sheet flow to storm drains or wetland indicators were noted. The project site is located at an approximate elevation of 427 feet above mean sea level (amsl) (USGS 1998).

Existing structures onsite are limited to two Southern California Edison transmission line towers, both located near the southern boundary, and two areas with small cement slab remnants.

Underlying geology is mapped as Young Alluvial-Fan Deposits of late Holocene (Morton and Miller 2003), and soils are mapped as Hanford Association (USDA 1969).

Vegetation Communities/Flora and Wildlife Habitats/Fauna

Four vegetation types were identified on the project site during the biological survey (Table 2; Figure 2). A complete list of the floral species observed and the faunal species observed or detected on the project site during the biological survey has been included with this report in Appendices A and B, respectively.

Table 2. Existing Habitats/Vegetation Communities on the Project Site

Vegetation Type	Holland Code	Existing On-Site Acres
Urban/developed	N/A	0.1
Non-native vegetation	N/A	0.5
Disturbed habitat	N/A	0.7
Non-native grassland	42200	15.9
	Total:	**17.2**



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Biological Resources Map

Irwindale Materials Recovery Facility and Transfer Station Project

Figure 2

The urban/developed areas consist of two Southern California Edison transmission line towers and two locations with cement slabs, one of which supports an abandoned water storage tank and water pump.

Non-native vegetation consists primarily of ornamental plantings. The most dominant species were pine (*Pinus* sp.), California fan palm (*Washingtonia filifera*), Japanese honeysuckle (*Lonicera japonica*), white mulberry (*Morus alba*), Brazilian pepper tree (*Schinus terebinthifolius*), Chinese elm (*Ulmus parviflora*), and carrotwood (*Cupaniopsis anacardioides*). While to a lesser degree, native opportunistically established species occurring among the ornamental species include laurel sumac (*Malosma laurina*), California sagebrush (*Artemisia californica*), mule fat (*Baccharis salicifolia*), narrow-leaved willow (*Salix exigua*), Goodding's black willow (*Salix gooddingii*), and red willow (*Salix laevigata*).

The disturbed habitat onsite is configured as a long narrow strip, and is located parallel to, and on the south side of Arrow Highway. The surface of this area is compacted bare soil and gravel. The occurrence of several sewer manhole covers indicates that this strip is a sewer easement.

The non-native grassland is the most dominant vegetation community onsite, and consists of disturbance tolerant grasses and herbaceous species. Invasive non-native grasses include Bermuda grass (*Cynodon dactylon*), slender wild oat (*Avena barbata*), ripgut grass (*Bromus diandrus*), smilo grass (*Piptatherum miliaceum*), and fountain grass (*Pennisetum setaceum*). The most common herbaceous species include castor bean (*Ricinus communis*), Russian-thistle (*Amaranthus albus*), tumbleweed (*Salsola kali*), prickly lettuce (*Lactuca serriola*), and black mustard (*Brassica nigra*). Also included in this vegetation were a few disjunct clusters of native mule fat.

Despite the presence of some wetland associated plants such as great marsh evening primrose (*Oenothera elata*), four-petal European tamarisk (*Tamarix parviflora*), mule fat, and willows, the individual plants were dispersed among the non-native vegetation and sparsely across the non-native grassland, and are not associated with any streambed on or offsite and do not function as wetland habitat.

Fauna observed onsite included common birds, such as mourning dove (*Zenaida macroura*), house finch (*Carpodacus mexicanus*), killdear (*Charadrius vociferous*), common bushtit (*Psaltriparus minimus*), spotted towhee (*Pipilo maculates*), and black phoebe (*Sayornis nigricans*), western kingbird (*Tyrannus verticalis*), American crow (*Corvus brachyrhynchos*), and American kestrel (*Falco sparverius*), and mammals, such as Botta's pocket gopher (*Thomomys bottae*) and opossum (*Didelphis virginiana*). No avian nests were observed during the biological survey; however, the grassland and non-native trees could provide potentially

suitable nesting habitat for urban tolerant species. Although no raptors were observed during the survey, it is likely that the project site is opportunistically used by raptors traveling from the larger vegetated foraging areas to the north within the Santa Fe Flood Control Basin. In regard to large mammals, the isolated position of the project site and the continuous chain link fence would likely prohibit usage of the site by large mammals such as mule deer (*Odocoileus hemionus fuliginata*) and coyote (*Canis latrans clepticus*). Wildlife use of the property is expected to be minimal and restricted to urban tolerant species given the disturbed condition of the property.

CEQA Guidelines §15206 (b)(5) (Title 14, Chapter 3, Article 13) defines "sensitive wildlife habitats" as those "including but not limited to riparian lands, wetlands, bays, estuaries, and marshes and habitats for endangered, rare and threatened species as defined by §15380 (Chapter 3)". The urbanized setting of this project site significantly limits what types of flora and fauna can persist on this isolated property to common disturbance tolerant species. The Santa Fe Flood Control Basin, located adjacent Arrow Highway to the north of the project property is designed as a catchment area to entrap the large volumes of debris (sand, gravel, cobble, rock, boulders, vegetative material) and episodic high flow volumes that occur during periods of seasonally high precipitation. The river course that emerges from the high gradient San Gabriel Canyon and onto the San Gabriel Valley historically meandered across a widespread alluvial fan. This river has now been directed into a wide channel engineered to contain and guide these episodic high volume flows to the Pacific Ocean avoiding dangerous flooding of populated areas, and the flood control system has become surrounded by urbanization. Although non-native grassland can provide breeding and foraging habitat for some special status species and raptors, as well as habitat linkages between patches of higher value native vegetation, this site has little biological conservation value due to the general level of previous site disturbance and isolation within urban development, and is not considered to be a "sensitive wildlife habitat" as defined under CEQA.

Special Status Species

State CEQA Guidelines §15380 (Title 14, Chapter 3, Article 20) define "endangered, rare or threatened species" as "species or subspecies of animal or plant or variety of plant" listed under the Code of Federal Regulations, Title 50, Part 17.11 or 17.12 (Volume 1, Chapter I) or California Code of Regulations, Title 14, Sections 670.2 or 670.5 (Division 1, Subdivision 3, Chapter 3), or a species not included in the above listings but that can be shown to be "endangered" meaning "when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors" or "rare" meaning "although not presently

threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens or the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the Federal Endangered Species Act". CEQA guidelines Appendix G, Section IV generally refers to species that fall under the above criteria as "special status species".

For the purposes of this report, special status species include: species or subspecies of animal or plant or variety of plant listed under the Code of Federal Regulations, Title 50, Part 17.11 or 17.12 (Volume 1, Chapter I) or California Code of Regulations, Title 14, Sections 670.2 or 670.5 (Division 1, Subdivision 3, Chapter 3); and species designated as "Special Plants" or "Special Animals" in the CNDDB, which the CDFG uses to track the status of plants and animals in California designated as "rare" on multiple federal, state, and local lists.

No special status floral and faunal species were identified on the project site during the biological survey, and none are expected to occur based on the lack of potentially suitable habitat.

No CNDDB records of burrowing owl are located near the project site (CDFG 2009d), and no burrowing owls were observed during the biological survey. In addition, no potentially suitable burrows or active sign (i.e., molted feathers, cast pellets, prey remains, eggshell fragments, and/or excrement) were identified on the project site during the habitat assessment/burrow survey. Burrowing owls have a low potential to occur onsite based on the level of disturbance and lack of potentially suitable habitat.

Jurisdictional Wetlands and Waterways

No evidence of jurisdictional wetlands or waterways on or adjacent to the project site during the biological survey.

PROJECT IMPACT ANALYSIS

Thresholds of Significance

State CEQA Guidelines §15065 (a) (Title 14, Chapter 3, Article 5) states, "A project may have a significant effect on the environment" if:

- "The project has the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife

population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species; or eliminate important examples of the major periods of California history or prehistory."

- "The project has possible environmental effects which are individually limited but cumulatively considerable."

The following analysis identifies potential impacts to biological resources that could result from implementation of the proposed project, and addresses the significance of these impacts pursuant to CEQA, in accordance with the Issues listed under CEQA Guidelines Appendix G, Section IV.

Impact Definitions

Project impacts are categorized pursuant to CEQA as direct, indirect, or cumulative impacts.

- CEQA Guidelines §15358 (a) (1) and (b) (Title 14, Chapter 3, Article 20) defines a "direct impact or primary effect" as "effects which are caused by the project and occur at the same time and place" and relate to a "physical change" in the environment.

- CEQA Guidelines §15358 (a) (2) and (b) (Title 14, Chapter 3, Article 20) defines an "indirect impact or secondary effect" as "effects which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable" and relate to a "physical change" in the environment.

- CEQA Guidelines §15355 (Title 14, Chapter 3, Article 20) defines "cumulative impacts" as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts."

Direct and indirect impacts can be described as either permanent or temporary. Permanent impacts are generally defined as effects that would result in an irreversible loss of biological resources; temporary impacts can be defined as effects that could be restored, thus providing habitat and wildlife functions and values effectively equal to the functions and values that existed before the area was impacted.

Project Impacts and Significance

Special Status Species

The proposed project would not result in impacts to special status species since none were detected or are expected to occur on or adjacent to the project site.

Riparian Habitat or Sensitive Natural Communities

The proposed project would result in permanent, direct impacts to the vegetation on the entire project site through permanent loss of these resources by conversion of the land to industrial/business (Table 3; see Figure 2). Impacts to urban development land, disturbed habitat, and non-native vegetation would not be significant under CEQA since these habitats do not support special status species on-site, and regionally, are not considered to have high conservation value requiring mitigation. Although the non-native grassland on-site does provide some biological value, the habitat is not considered to be a sensitive habitat type under CEQA and does not provide a critical linkage to other areas of native habitat; therefore, project impacts to non-native grassland would not be significant under CEQA.

Table 3. Habitats/Vegetation Communities, Impacts, and Mitigation

Vegetation Type	Existing (acres)	On-Site Impacts (acres)	Off-Site Impacts (acres)	Mitigation Ratio	Mitigation Required (acres)
Urban/developed	0.1	0.1	0.0	N/A	0.0
Non-native vegetation	0.5	0.5	0.0	N/A	0.0
Disturbed habitat	0.7	0.7	0.0	N/A	00.
Non-native grassland	15.9	15.9	0.0	None	00.
Total:	17.2	17.2	**0.0**		**0.0**

Jurisdictional Wetlands and Waterways

The proposed project would not result in impacts to jurisdictional wetlands or waterways since none were identified on the project site during the biological survey.

Wildlife Movement and Nursery Sites

Due to the isolation of the project site, level of previous disturbance, and lack of adjacent natural habitats, development of the property would not create artificial wildlife corridors or

substantially interfere with connectivity to off-site habitat, or substantially limit access to potential foraging/breeding habitat or water sources necessary for the successful reproduction of resident wildlife species.

Local Policies, Ordinances, and Adopted Plans

Under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. section 703-712; Ch. 128; July 3, 1918; 40 Stat. 755; as amended 1936, 1956, 1960, 1968, 1969, 1974, 1978, 1986 and 1998), it is unlawful, except as permitted by the USFWS, to "take, possess, transport, sell, purchase, barter, import, or export all species of birds protected by the MBTA, as well as their feathers, parts, nests, or eggs (USFWS 2003). Take means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect (50 CFR 10.12). Birds protected by the MBTA include all birds covered by the treaties for the protection of migratory birds between the United States and Great Britain (on behalf of Canada, 1916), Mexico (1936), Japan (1972), and Russia (1976), and subsequent amendments."

It is important to note that since the MBTA addresses migratory birds by family rather than at a lower taxonomic level, most bird species are protected by the MBTA because most taxonomic families include migratory members. In addition, "take" as defined under the federal MBTA is not synonymous with "take" as defined under the federal Endangered Species Act (ESA). The MBTA definition of "take" lacks a "harm and harassment" clause comparable to "take" under the ESA, thus, the MBTA authority does not extend to activities beyond the nests, eggs, feathers, or specific bird parts (i.e., activities or habitat modification in the vicinity of nesting birds that do not result in "take" as defined under the MBTA are not prohibited). Further, "a permit is not required to dislodge or destroy migratory bird nests that are not occupied by juveniles or eggs; however, any such destruction that results in take of any migratory bird is a violation of the MBTA (i.e., where juveniles still depend on the nest for survival) (USFWS 2003)."

Sections 3503, 3503.5, and 3513 of the California Fish and Game Code also prohibit the "take, possession, or destruction of bird nests or eggs." Section 3503 states: "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Section 3503.5 provides a refined and greater protection for birds-of-prey and states: "It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." The distinctions made for birds-of-prey are the inclusion of such birds themselves to the protections and the elimination of the term "needlessly" from the language of §3503. Section 3513 states: "It is unlawful to take or possess any migratory nongame bird as

designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act."

The definition of "take" under the California Fish and Game Code is not distinct from the definition of "take" under California Endangered Species Act (CESA), which is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (California Fish and Game Code §86); however, it is important to note that the state definition of "take" again does not include a "harm and harassment" clause, and thus, activities or habitat modification in the vicinity of nesting birds that do not result in "take" as defined under the California Fish and Game Code/CESA are not prohibited.

Since some resident and/or migratory avian species have a potential to nest in the grassland and non-native trees on-site, project construction could result in "take" of these species under the federal MBTA and California Fish and Game Codes §3503 and §3513; therefore, all grading and construction activities undertaken for the project shall comply with the regulatory requirements of the federal MBTA and California Fish and Game Codes §3503 and §3513.

Cumulative Impacts

Cumulative biological impacts within the City of Irwindale have not been analyzed under the General Plan or a related, adopted planning document. The proposed project would result in additional cumulative impacts to non-native grassland, as well as loss of potential foraging habitat for some resident wildlife species; however, the onsite habitat is of low conservation value, and does not provide habitat for special status species or habitat linkages to higher value native habitat offsite. Thus, project impacts would be less than cumulatively considerable under CEQA.

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APPENDIX A. FLORA SPECIES OBSERVED ON-SITE

Habitat Types:

U	=	Urban/developed
V	=	Non-native vegetation
D	=	Disturbed habitat
G	=	Non-native grassland

* = Denotes non-native flora species.

Scientific Name	Common Name	Habitat
GYMNOSPERMS		
Pinaceae - Pine Family		
**Deodar cedar*	Himalayan cedar	G
**Pinus* sp.	pine	V
DICOTYLEDONS		
Amaranthaceae - Amaranth Family		
**Amaranthus albus* L.	tumbleweed	G
**Salsola kali* L. ssp. *pontica* (Pallas) Mosyakin	Russian-thistle	G
Anacardiaceae - Sumac Family		
Malosma laurina (Nutt.) Abrams	laurel sumac	V
**Schinus terebinthifolius* Raddi	Brazilian pepper tree	V
Asteraceae - Sunflower Family		
Ambrosia acanthicarpa Hook.	annual bur-sage	G
Artemisia californica Less.	California sagebrush	V
Baccharis salicifolia (Ruíz Lopez & Pavón) Pers.	mule fat, seep-willow	V
**Bidens pilosa* L. var. *pilosa*	common beggar's tick	V
Conyza canadensis (L.) Cronq.	horseweed	D,G
Helianthus annuus L.	western sunflower	V
Heterotheca grandiflora Nutt.	telegraph weed	D,G
**Lactuca serriola* L.	prickly lettuce	D,G
Brassicaceae - Mustard Family		
**Brassica nigra* (L.) Koch	black mustard	D,G
Caprifoliaceae - Honeysuckle Family		
**Lonicera japonica* Thunb.	Japanese honeysuckle	V
Convolvulaceae - Morning-Glory Family		
**Convolvulus arvensis* L.	field bindweed	V
Euphorbiaceae - Spurge Family		
**Ricinus communis* L.	castor-bean	V,G
Moraceae - Mulberry Family		
**Morus alba*	white mulberry	V
Onagraceae - Evening-Primrose Family		
Oenothera elata Kunth ssp. *hirsutissima* (S. Watson) W. Dietr.	great marsh evening primrose	V

Scientific Name	Common Name	Habitat
Platanaceae - Sycamore Family		
Platanus racemosa Nutt.	western sycamore	V
Salicaceae - Willow Family		
Salix exigua Nutt.	narrow-leaved willow	V
Salix gooddingii C. Ball	Goodding's black willow	V
Salix laevigata Bebb	red willow	V
Sapindaceae – Soapberry Family		
**Cupaniopsis anacardioides* (A. Rich) Radlk.	carrotwood	V
Simaroubaceae - Quassia Family		
**Ailanthus altissima* (Miller) Swingle	tree of heaven	G
Tamaricaceae - Tamarisk Family		
**Tamarix parviflora* DC.	four-petal European tamarisk	V
Ulmaceae – Elm Family		
**Ulmus parviflora* Jacq.	Chinese elm	V
Arecaceae - Palm Family		
Washingtonia filifera (André) H. Wendl.	California fan palm	V
Poaceae - Grass Family		
**Avena barbata* Link	slender wild oat	G
**Bromus diandrus* Roth	ripgut grass	G
**Cynodon dactylon* (L.)Pers.	Bermuda grass	G
**Pennisetum setaceum* Forsskal	fountain grass	G
**Piptatherum miliaceum* (L.) Cosson	smilo grass	G

APPENDIX B. FAUNA SPECIES OBSERVED OR DETECTED ON-SITE

Habitat Types:

U	=	Urban/developed
V	=	Non-native vegetation
D	=	Disturbed habitat
G	=	Non-native grassland
FO	=	fly over

* = denotes introduced species

Abundance Codes (birds only):

A = Abundant: Almost always encountered in moderate to large numbers in suitable habitat and the indicated season.

C = Common: Usually encountered in proper habitat at the given season.

U = Uncommon: Infrequently detected in suitable habitat. May occur in small numbers or only locally in the given season.

R = Rare: Applies to species that are found in very low numbers.

"Numbers" indicate the number of individuals observed during the field survey work.

Status Codes (birds only):

M = Migrant: Uses the site for brief periods of time, primarily during the spring and fall months.

R = Year-round resident: Probable breeder on-site or in the vicinity.

S = Spring/summer resident: Probable breeder on-site or in the vicinity unless combined with transient status.

T = Transient: Uses site irregularly in summer but unlikely to breed. Not a true migrant and actual status often poorly known.

W = Winter visitor: Does not breed locally.

V = Casual vagrant: Not expected; out of normal geographic or seasonal range and by definition rare.

Common Name	Scientific Name	Habitat	Abundance	Status
BIRDS				
Falconidae (Caracaras and Falcons)				
American kestrel	*Falco sparverius*	U, G	C	R
Charadriidae (Plovers and Relatives)				
killdeer	*Charadrius vociferous*	G	C	R
Columbidae (Pigeons and Doves)				
mourning dove	*Zenaida macroura*	U,V, G	C	R
Trochilidae (Hummingbirds)				
Anna's hummingbird	*Calypte anna*	V	C	R
Tyrannidae (Tyrant Flycatchers)				
black phoebe	*Sayornis nigricans*	V,G	C	R
western kingbird	*Tyrannus verticalis*	V	C	M, S
Corvidae (Jays, Magpies, and Crows)				
American crow	*Corvus brachyrhynchos*	FO	A	R
Aegithalidae (Bushtit)				
bushtit	*Psaltriparus minimus*	V,G	C	R
Fringillidae (Finches)				
house finch	*Carpodacus mexicanus*	V	A	R
MAMMALS				
Didelphidae (American Opossums and Opossums)				
* Virginia opossum	*Didelphis virginiana*	V		
Geomyidae (Pocket Gophers)				
Botta's pocket gopher	*Thomomys bottae*	G		

Biological Impact Analysis Letter Report
Irwindale Materials Recovery Facility and Transfer Station Project

Prepared by:
Merkel & Associates, Inc.
October 2009

SUMMARY OF FINDINGS

Merkel & Associates, Inc. (M&A) has prepared this biological impact analysis report for the proposed Irwindale Materials Recovery Facility and Transfer Station Project. The purpose of this report is to document the biological conditions within the project study area; identify potential impacts to biological resources that could result from implementation of the project; and recommend measures to avoid, minimize, and/or mitigate significant impacts consistent with the California Environmental Quality Act (CEQA) and all applicable federal, state, and local rules and regulations.

The approximate 17.2-acre project site (Assessors Parcel Number, 8535-001-911) is located east of Interstate 605, south of the Santa Fe Flood Control Basin and immediately south of Arrow Highway and north of Live Oak Avenue. The proposed project is the construction of a materials recovery facility and transfer station, along with a fueling facility/convenience store that would be open to the public.

Although the area of the project property is currently located below the Santa Fe Flood Control Basin and out of the channelized San Gabriel River drainage system, it was historically part of the large alluvial fan formed at the based of the San Gabriel Mountains. The property has experienced long-term soil disturbance activities such as mechanical grading and mixing, which would have destroyed any natural soil horizons. Currently, the property is graded flat with about eight small piles of cobble-small boulders, two minor locations with cement slabs, and two Southern California Edison transmission line towers. The majority of the site includes non-native grassland, as well as non-native vegetation and disturbed habitat.

No special status floral and faunal species, or jurisdictional wetland or waterways were identified on or adjacent to the project site during the biological survey.

The proposed project would result in permanent, direct impacts to the vegetation on the entire project site through permanent loss of these resources by conversion of the land to industrial/business. Although the non-native grassland on-site does provide some biological value, the habitat is not considered to be a sensitive habitat type under CEQA and does not provide a critical linkage to other areas of native habitat; therefore, project impacts to non-native grassland would not be significant under CEQA, and no habitat based mitigation would be required.

Since some resident and/or migratory avian species have a potential to nest in the grassland and non-native trees onsite, project construction could result in "take" of these species under the federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Codes §3503 and

§3513; therefore, all grading and construction activities undertaken for the project shall comply with the regulatory requirements of the federal MBTA and California Fish and Game Codes §3503 and §3513.

INTRODUCTION

Purpose of the Report

Merkel & Associates, Inc. (M&A) has prepared this biological impact analysis report for the proposed Irwindale Materials Recovery Facility and Transfer Station Project. The purpose of this report is to document the existing biological conditions within the project study area; identify potential impacts to biological resources that could result from implementation of the project; and recommend measures to avoid, minimize, and/or mitigate significant impacts consistent with the California Environmental Quality Act (CEQA) and all applicable federal, state, and local rules and regulations.

Project Location

The 17.2-acre project site (Assessors Parcel Number 8535-001-911) is located within unsectioned lands, Township 1 South, Range 10 West of the San Bernardino Base and Meridian; U.S. Geological Survey Baldwin Park, California Quadrangle (Figure 1).

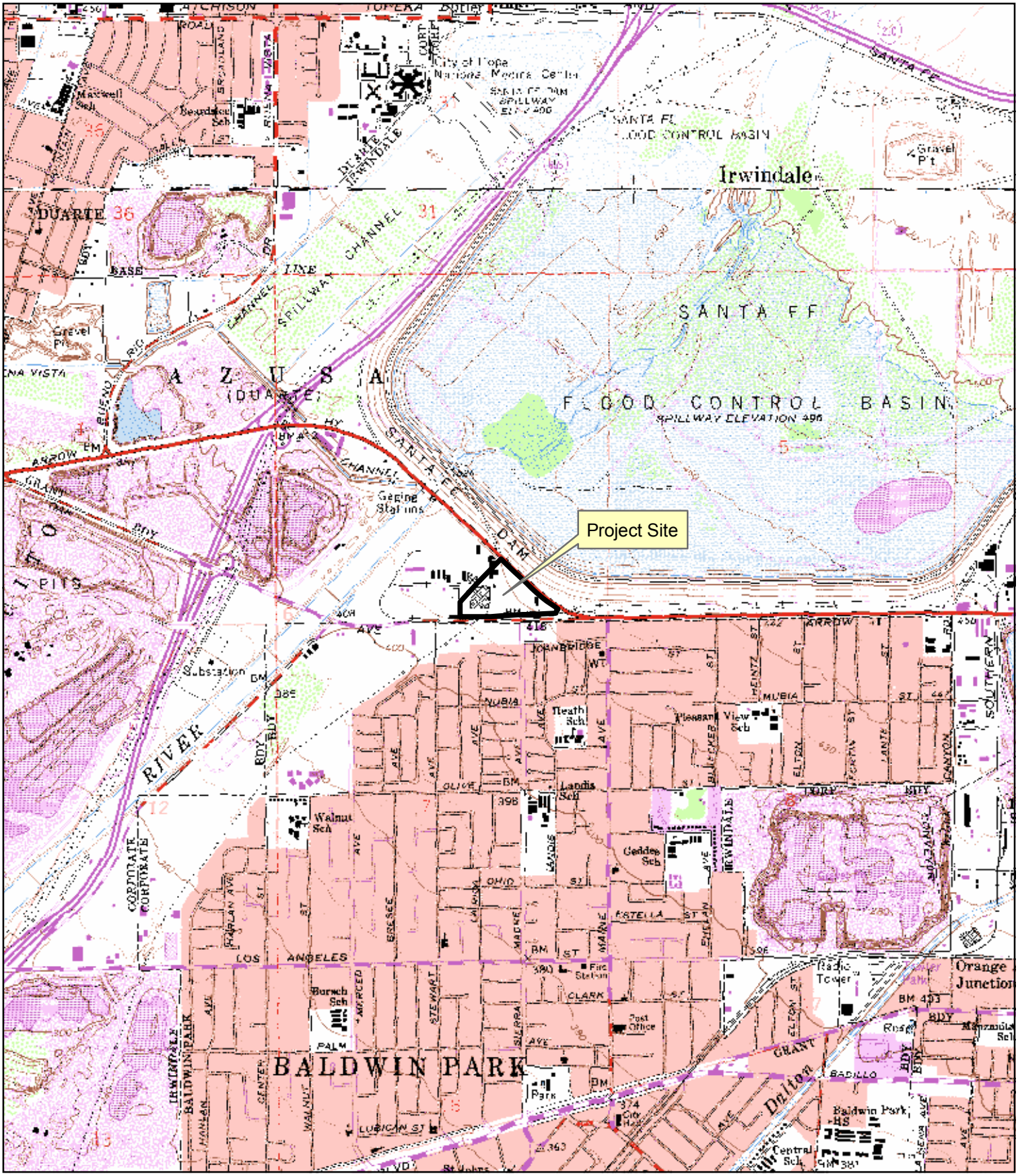
Project Description

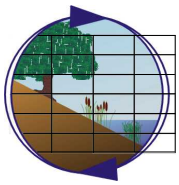
Athens Services proposes to construct a materials recovery facility and transfer station on the project site, along with a fueling facility/convenience store that would be open to the public. The material recovery facility and transfer station would include the majority of the building development totaling approximately 320,000 square-feet of the project site. The fueling area/convenience store would be a separate structure totaling approximately 3,000 square-feet located on the eastern portion of the project site.

METHODS

Literature and Data Review

Historical and currently available biological literature and data pertaining to the project area were reviewed prior to initiation of the field investigation. This review included examination of: 1) geological substrates and soil types mapped on the project site (Morton and Miller 2003 and USDA 1969, respectively); 2) National Wetland Inventory (NWI) maps of the project region





N
W E
S

1:24000

Project Vicinity Map

Irwindale Materials Recovery Facility
and Transfer Station Project
Source: USGS 7.5' Baldwin Park, CA Quadrangle

Figure 1

(USFWS 1985); 3) federally designated critical habitat for the project region (USFWS 2009b); 4) California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB) and U.S. Fish and Wildlife Service (USFWS) special status species records for the project vicinity (CDFG 2009d and USFWS, respectively); and 5) the biological constraints analysis report prepared by BonTerra Consulting for a portion of the site, dated June 9, 2009.

Survey Conducted

General Biological Survey

M&A conducted a general biological survey of the entire project site on-foot. Existing vegetation types were delineated onto a 1" = 117' scale, color aerial photograph (Air Photo USA 2007) with topographical overlay of the project site. The vegetation types were classified according to the Holland (1986) code classification system.

A list of detectable flora and fauna species was recorded in a field notebook. Plant identifications were either resolved in the field or later determined through verification of voucher specimens, and wildlife species were determined through direct observation (aided by binoculars), identification of songs, call notes and alarm calls, or by detection of sign (e.g., burrows, tracks, scat, etc.).

In addition, a directed search for special status species on the project site was conducted. The potential for sensitive species to occur on the project site, but not identified during the survey, was assessed based on the existing biological conditions, as well as historical and currently available species data.

The scientific and common names utilized for the floral and faunal resources were noted according to the following nomenclature: flora, Baldwin et al. (2008); birds, American Ornithologists' Union (1998 and 2008); and mammals, (species level) Wilson and Reeder (2005) and (sub-species level) Hall (1981).

Photographs of the project area were taken to record the biological resources present within the study area, and data collected from the survey were digitized into current Geographical Information System (GIS) Environmental Systems Research Institute (ESRI) software platforms.

Burrowing Owl Habitat Assessment/Burrow Survey

M&A conducted a habitat assessment/burrow survey for the burrowing owl (*Athene cunicularia*), which is designated as a California special concern species by the CDFG, according to the most recent guidelines used by the CDFG, as noted in the *Burrowing Owl Survey Protocol and Mitigation Guidelines, prepared by the California Burrowing Owl Consortium in April 1993.* The assessment consisted of searching for the presence of potential natural or artificial burrows (culverts, debris piles, storm drains, etc.) by walking transects through potentially suitable habitat on the project site and areas within 150 meters (approximately 500 feet) of the proposed project impact zone to allow 100 percent visual coverage of the ground surface. The entire project site was surveyed on-foot; the portions of the study area that extended beyond the project site were visually surveyed only from the property boundary lines or areas of public access.

Survey Date(s), Time(s), and Conditions

Table 1 summarizes the survey date, time, and conditions.

Table 1. Survey Information

Survey	Date	Time	Conditions (start to end)	Biologist
General biology	26 Oct 2009	0625 - 0915	Weather: 0%-0% cc Wind: 1-1 BS Temperature: 66°-74° F	Edward L. Ervin

cc = cloud cover; BS = Beaufort scale; F = Fahrenheit

Survey Limitations

Biological inventories are generally subject to various survey limitations. Depending on the season and time of day during which field surveys are conducted, some species of annual plants, invertebrates, amphibians, reptiles, birds, and mammals may not be detected due to temporal species variability. All portions of the project site were accessible during the biological survey. Permission to access the City-owned land was granted by the City of Irwindale. Some annual plants, migratory or nesting birds, and crepuscular or nocturnal wildlife may not have been detected during the biological survey; however, based on the biological literature and data review performed, as well as knowledge of species-specific habitat requirements, it is anticipated that any additional species potentially present on the project site can be fairly accurately predicted,

and that the survey conducted was sufficient in obtaining a thorough review of the biological resources present on the project site.

EXISTING BIOLOGICAL CONDITIONS

Regional Context and General Physiography

The project site not located within federally designated critical habitat.

The project property is generally situated between Arrow Highway and Live Oak Avenue, in the shape of a triangle, with light industrial operations and facilities to its northwest and south, and the Santa Fe Flood Control Basin to the northeast. One block south of the light industry along the southern boundary of the project property are residential areas.

The topography of the project site is relatively flat with a consistent dip to the southwest. The surface texture is rough with an abundance of cobble, rock, small boulders, and striations created by periodic vegetation clearing activities from soil ripping. No water conveyance features carrying runoff sheet flow to storm drains or wetland indicators were noted. The project site is located at an approximate elevation of 427 feet above mean sea level (amsl) (USGS 1998).

Existing structures onsite are limited to two Southern California Edison transmission line towers, both located near the southern boundary, and two areas with small cement slab remnants.

Underlying geology is mapped as Young Alluvial-Fan Deposits of late Holocene (Morton and Miller 2003), and soils are mapped as Hanford Association (USDA 1969).

Vegetation Communities/Flora and Wildlife Habitats/Fauna

Four vegetation types were identified on the project site during the biological survey (Table 2; Figure 2). A complete list of the floral species observed and the faunal species observed or detected on the project site during the biological survey has been included with this report in Appendices A and B, respectively.

Table 2. Existing Habitats/Vegetation Communities on the Project Site

Vegetation Type	Holland Code	Existing On-Site Acres
Urban/developed	N/A	0.1
Non-native vegetation	N/A	0.5
Disturbed habitat	N/A	0.7
Non-native grassland	42200	15.9
	Total:	**17.2**



N
W E
S

Biological Resources Map

Irwindale Materials Recovery Facility and Transfer Station Project

Figure 2

The urban/developed areas consist of two Southern California Edison transmission line towers and two locations with cement slabs, one of which supports an abandoned water storage tank and water pump.

Non-native vegetation consists primarily of ornamental plantings. The most dominant species were pine (*Pinus* sp.), California fan palm (*Washingtonia filifera*), Japanese honeysuckle (*Lonicera japonica*), white mulberry (*Morus alba*), Brazilian pepper tree (*Schinus terebinthifolius*), Chinese elm (*Ulmus parviflora*), and carrotwood (*Cupaniopsis anacardioides*). While to a lesser degree, native opportunistically established species occurring among the ornamental species include laurel sumac (*Malosma laurina*), California sagebrush (*Artemisia californica*), mule fat (*Baccharis salicifolia*), narrow-leaved willow (*Salix exigua*), Goodding's black willow (*Salix gooddingii*), and red willow (*Salix laevigata*).

The disturbed habitat onsite is configured as a long narrow strip, and is located parallel to, and on the south side of Arrow Highway. The surface of this area is compacted bare soil and gravel. The occurrence of several sewer manhole covers indicates that this strip is a sewer easement.

The non-native grassland is the most dominant vegetation community onsite, and consists of disturbance tolerant grasses and herbaceous species. Invasive non-native grasses include Bermuda grass (*Cynodon dactylon*), slender wild oat (*Avena barbata*), ripgut grass (*Bromus diandrus*), smilo grass (*Piptatherum miliaceum*), and fountain grass (*Pennisetum setaceum*). The most common herbaceous species include castor bean (*Ricinus communis*), Russian-thistle (*Amaranthus albus*), tumbleweed (*Salsola kali*), prickly lettuce (*Lactuca serriola*), and black mustard (*Brassica nigra*). Also included in this vegetation were a few disjunct clusters of native mule fat.

Despite the presence of some wetland associated plants such as great marsh evening primrose (*Oenothera elata*), four-petal European tamarisk (*Tamarix parviflora*), mule fat, and willows, the individual plants were dispersed among the non-native vegetation and sparsely across the non-native grassland, and are not associated with any streambed on or offsite and do not function as wetland habitat.

Fauna observed onsite included common birds, such as mourning dove (*Zenaida macroura*), house finch (*Carpodacus mexicanus*), killdear (*Charadrius vociferous*), common bushtit (*Psaltriparus minimus*), spotted towhee (*Pipilo maculates*), and black phoebe (*Sayornis nigricans*), western kingbird (*Tyrannus verticalis*), American crow (*Corvus brachyrhynchos*), and American kestrel (*Falco sparverius*), and mammals, such as Botta's pocket gopher (*Thomomys bottae*) and opossum (*Didelphis virginiana*). No avian nests were observed during the biological survey; however, the grassland and non-native trees could provide potentially

suitable nesting habitat for urban tolerant species. Although no raptors were observed during the survey, it is likely that the project site is opportunistically used by raptors traveling from the larger vegetated foraging areas to the north within the Santa Fe Flood Control Basin. In regard to large mammals, the isolated position of the project site and the continuous chain link fence would likely prohibit usage of the site by large mammals such as mule deer (*Odocoileus hemionus fuliginata*) and coyote (*Canis latrans clepticus*). Wildlife use of the property is expected to be minimal and restricted to urban tolerant species given the disturbed condition of the property.

CEQA Guidelines §15206 (b)(5) (Title 14, Chapter 3, Article 13) defines "sensitive wildlife habitats" as those "including but not limited to riparian lands, wetlands, bays, estuaries, and marshes and habitats for endangered, rare and threatened species as defined by §15380 (Chapter 3)". The urbanized setting of this project site significantly limits what types of flora and fauna can persist on this isolated property to common disturbance tolerant species. The Santa Fe Flood Control Basin, located adjacent Arrow Highway to the north of the project property is designed as a catchment area to entrap the large volumes of debris (sand, gravel, cobble, rock, boulders, vegetative material) and episodic high flow volumes that occur during periods of seasonally high precipitation. The river course that emerges from the high gradient San Gabriel Canyon and onto the San Gabriel Valley historically meandered across a widespread alluvial fan. This river has now been directed into a wide channel engineered to contain and guide these episodic high volume flows to the Pacific Ocean avoiding dangerous flooding of populated areas, and the flood control system has become surrounded by urbanization. Although non-native grassland can provide breeding and foraging habitat for some special status species and raptors, as well as habitat linkages between patches of higher value native vegetation, this site has little biological conservation value due to the general level of previous site disturbance and isolation within urban development, and is not considered to be a "sensitive wildlife habitat" as defined under CEQA.

Special Status Species

State CEQA Guidelines §15380 (Title 14, Chapter 3, Article 20) define "endangered, rare or threatened species" as "species or subspecies of animal or plant or variety of plant" listed under the Code of Federal Regulations, Title 50, Part 17.11 or 17.12 (Volume 1, Chapter I) or California Code of Regulations, Title 14, Sections 670.2 or 670.5 (Division 1, Subdivision 3, Chapter 3), or a species not included in the above listings but that can be shown to be "endangered" meaning "when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors" or "rare" meaning "although not presently

threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens or the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the Federal Endangered Species Act". CEQA guidelines Appendix G, Section IV generally refers to species that fall under the above criteria as "special status species".

For the purposes of this report, special status species include: species or subspecies of animal or plant or variety of plant listed under the Code of Federal Regulations, Title 50, Part 17.11 or 17.12 (Volume 1, Chapter I) or California Code of Regulations, Title 14, Sections 670.2 or 670.5 (Division 1, Subdivision 3, Chapter 3); and species designated as "Special Plants" or "Special Animals" in the CNDDB, which the CDFG uses to track the status of plants and animals in California designated as "rare" on multiple federal, state, and local lists.

No special status floral and faunal species were identified on the project site during the biological survey, and none are expected to occur based on the lack of potentially suitable habitat.

No CNDDB records of burrowing owl are located near the project site (CDFG 2009d), and no burrowing owls were observed during the biological survey. In addition, no potentially suitable burrows or active sign (i.e., molted feathers, cast pellets, prey remains, eggshell fragments, and/or excrement) were identified on the project site during the habitat assessment/burrow survey. Burrowing owls have a low potential to occur onsite based on the level of disturbance and lack of potentially suitable habitat.

Jurisdictional Wetlands and Waterways

No evidence of jurisdictional wetlands or waterways on or adjacent to the project site during the biological survey.

PROJECT IMPACT ANALYSIS

Thresholds of Significance

State CEQA Guidelines §15065 (a) (Title 14, Chapter 3, Article 5) states, "A project may have a significant effect on the environment" if:

- "The project has the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife

population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species; or eliminate important examples of the major periods of California history or prehistory."

- "The project has possible environmental effects which are individually limited but cumulatively considerable."

The following analysis identifies potential impacts to biological resources that could result from implementation of the proposed project, and addresses the significance of these impacts pursuant to CEQA, in accordance with the Issues listed under CEQA Guidelines Appendix G, Section IV.

Impact Definitions

Project impacts are categorized pursuant to CEQA as direct, indirect, or cumulative impacts.

- CEQA Guidelines §15358 (a) (1) and (b) (Title 14, Chapter 3, Article 20) defines a "direct impact or primary effect" as "effects which are caused by the project and occur at the same time and place" and relate to a "physical change" in the environment.

- CEQA Guidelines §15358 (a) (2) and (b) (Title 14, Chapter 3, Article 20) defines an "indirect impact or secondary effect" as "effects which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable" and relate to a "physical change" in the environment.

- CEQA Guidelines §15355 (Title 14, Chapter 3, Article 20) defines "cumulative impacts" as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts."

Direct and indirect impacts can be described as either permanent or temporary. Permanent impacts are generally defined as effects that would result in an irreversible loss of biological resources; temporary impacts can be defined as effects that could be restored, thus providing habitat and wildlife functions and values effectively equal to the functions and values that existed before the area was impacted.

Project Impacts and Significance

Special Status Species

The proposed project would not result in impacts to special status species since none were detected or are expected to occur on or adjacent to the project site.

Riparian Habitat or Sensitive Natural Communities

The proposed project would result in permanent, direct impacts to the vegetation on the entire project site through permanent loss of these resources by conversion of the land to industrial/business (Table 3; see Figure 2). Impacts to urban development land, disturbed habitat, and non-native vegetation would not be significant under CEQA since these habitats do not support special status species on-site, and regionally, are not considered to have high conservation value requiring mitigation. Although the non-native grassland on-site does provide some biological value, the habitat is not considered to be a sensitive habitat type under CEQA and does not provide a critical linkage to other areas of native habitat; therefore, project impacts to non-native grassland would not be significant under CEQA.

Table 3. Habitats/Vegetation Communities, Impacts, and Mitigation

Vegetation Type	Existing (acres)	On-Site Impacts (acres)	Off-Site Impacts (acres)	Mitigation Ratio	Mitigation Required (acres)
Urban/developed	0.1	0.1	0.0	N/A	0.0
Non-native vegetation	0.5	0.5	0.0	N/A	0.0
Disturbed habitat	0.7	0.7	0.0	N/A	00.
Non-native grassland	15.9	15.9	0.0	None	00.
Total:	17.2	17.2	**0.0**		**0.0**

Jurisdictional Wetlands and Waterways

The proposed project would not result in impacts to jurisdictional wetlands or waterways since none were identified on the project site during the biological survey.

Wildlife Movement and Nursery Sites

Due to the isolation of the project site, level of previous disturbance, and lack of adjacent natural habitats, development of the property would not create artificial wildlife corridors or

substantially interfere with connectivity to off-site habitat, or substantially limit access to potential foraging/breeding habitat or water sources necessary for the successful reproduction of resident wildlife species.

Local Policies, Ordinances, and Adopted Plans

Under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. section 703-712; Ch. 128; July 3, 1918; 40 Stat. 755; as amended 1936, 1956, 1960, 1968, 1969, 1974, 1978, 1986 and 1998), it is unlawful, except as permitted by the USFWS, to "take, possess, transport, sell, purchase, barter, import, or export all species of birds protected by the MBTA, as well as their feathers, parts, nests, or eggs (USFWS 2003). Take means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect (50 CFR 10.12). Birds protected by the MBTA include all birds covered by the treaties for the protection of migratory birds between the United States and Great Britain (on behalf of Canada, 1916), Mexico (1936), Japan (1972), and Russia (1976), and subsequent amendments."

It is important to note that since the MBTA addresses migratory birds by family rather than at a lower taxonomic level, most bird species are protected by the MBTA because most taxonomic families include migratory members. In addition, "take" as defined under the federal MBTA is not synonymous with "take" as defined under the federal Endangered Species Act (ESA). The MBTA definition of "take" lacks a "harm and harassment" clause comparable to "take" under the ESA, thus, the MBTA authority does not extend to activities beyond the nests, eggs, feathers, or specific bird parts (i.e., activities or habitat modification in the vicinity of nesting birds that do not result in "take" as defined under the MBTA are not prohibited). Further, "a permit is not required to dislodge or destroy migratory bird nests that are not occupied by juveniles or eggs; however, any such destruction that results in take of any migratory bird is a violation of the MBTA (i.e., where juveniles still depend on the nest for survival) (USFWS 2003)."

Sections 3503, 3503.5, and 3513 of the California Fish and Game Code also prohibit the "take, possession, or destruction of bird nests or eggs." Section 3503 states: "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Section 3503.5 provides a refined and greater protection for birds-of-prey and states: "It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." The distinctions made for birds-of-prey are the inclusion of such birds themselves to the protections and the elimination of the term "needlessly" from the language of §3503. Section 3513 states: "It is unlawful to take or possess any migratory nongame bird as

designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act."

The definition of "take" under the California Fish and Game Code is not distinct from the definition of "take" under California Endangered Species Act (CESA), which is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (California Fish and Game Code §86); however, it is important to note that the state definition of "take" again does not include a "harm and harassment" clause, and thus, activities or habitat modification in the vicinity of nesting birds that do not result in "take" as defined under the California Fish and Game Code/CESA are not prohibited.

Since some resident and/or migratory avian species have a potential to nest in the grassland and non-native trees on-site, project construction could result in "take" of these species under the federal MBTA and California Fish and Game Codes §3503 and §3513; therefore, all grading and construction activities undertaken for the project shall comply with the regulatory requirements of the federal MBTA and California Fish and Game Codes §3503 and §3513.

Cumulative Impacts

Cumulative biological impacts within the City of Irwindale have not been analyzed under the General Plan or a related, adopted planning document. The proposed project would result in additional cumulative impacts to non-native grassland, as well as loss of potential foraging habitat for some resident wildlife species; however, the onsite habitat is of low conservation value, and does not provide habitat for special status species or habitat linkages to higher value native habitat offsite. Thus, project impacts would be less than cumulatively considerable under CEQA.

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APPENDIX A. FLORA SPECIES OBSERVED ON-SITE

Habitat Types:

U	=	Urban/developed
V	=	Non-native vegetation
D	=	Disturbed habitat
G	=	Non-native grassland

* = Denotes non-native flora species.

Scientific Name	Common Name	Habitat
GYMNOSPERMS		
Pinaceae - Pine Family		
**Deodar cedar*	Himalayan cedar	G
**Pinus* sp.	pine	V
DICOTYLEDONS		
Amaranthaceae - Amaranth Family		
**Amaranthus albus* L.	tumbleweed	G
**Salsola kali* L. ssp. *pontica* (Pallas) Mosyakin	Russian-thistle	G
Anacardiaceae - Sumac Family		
Malosma laurina (Nutt.) Abrams	laurel sumac	V
**Schinus terebinthifolius* Raddi	Brazilian pepper tree	V
Asteraceae - Sunflower Family		
Ambrosia acanthicarpa Hook.	annual bur-sage	G
Artemisia californica Less.	California sagebrush	V
Baccharis salicifolia (Ruíz Lopez & Pavón) Pers.	mule fat, seep-willow	V
**Bidens pilosa* L. var. *pilosa*	common beggar's tick	V
Conyza canadensis (L.) Cronq.	horseweed	D,G
Helianthus annuus L.	western sunflower	V
Heterotheca grandiflora Nutt.	telegraph weed	D,G
**Lactuca serriola* L.	prickly lettuce	D,G
Brassicaceae - Mustard Family		
**Brassica nigra* (L.) Koch	black mustard	D,G
Caprifoliaceae - Honeysuckle Family		
**Lonicera japonica* Thunb.	Japanese honeysuckle	V
Convolvulaceae - Morning-Glory Family		
**Convolvulus arvensis* L.	field bindweed	V
Euphorbiaceae - Spurge Family		
**Ricinus communis* L.	castor-bean	V,G
Moraceae - Mulberry Family		
**Morus alba*	white mulberry	V
Onagraceae - Evening-Primrose Family		
Oenothera elata Kunth ssp. *hirsutissima* (S. Watson) W. Dietr.	great marsh evening primrose	V

Scientific Name	Common Name	Habitat
Platanaceae - Sycamore Family		
Platanus racemosa Nutt.	western sycamore	V
Salicaceae - Willow Family		
Salix exigua Nutt.	narrow-leaved willow	V
Salix gooddingii C. Ball	Goodding's black willow	V
Salix laevigata Bebb	red willow	V
Sapindaceae – Soapberry Family		
**Cupaniopsis anacardioides* (A. Rich) Radlk.	carrotwood	V
Simaroubaceae - Quassia Family		
**Ailanthus altissima* (Miller) Swingle	tree of heaven	G
Tamaricaceae - Tamarisk Family		
**Tamarix parviflora* DC.	four-petal European tamarisk	V
Ulmaceae – Elm Family		
**Ulmus parviflora* Jacq.	Chinese elm	V
Arecaceae - Palm Family		
Washingtonia filifera (André) H. Wendl.	California fan palm	V
Poaceae - Grass Family		
**Avena barbata* Link	slender wild oat	G
**Bromus diandrus* Roth	ripgut grass	G
**Cynodon dactylon* (L.)Pers.	Bermuda grass	G
**Pennisetum setaceum* Forsskal	fountain grass	G
**Piptatherum miliaceum* (L.) Cosson	smilo grass	G

APPENDIX B. FAUNA SPECIES OBSERVED OR DETECTED ON-SITE

Habitat Types:

U	=	Urban/developed
V	=	Non-native vegetation
D	=	Disturbed habitat
G	=	Non-native grassland
FO	=	fly over

* = denotes introduced species

Abundance Codes (birds only):

A = Abundant: Almost always encountered in moderate to large numbers in suitable habitat and the indicated season.

C = Common: Usually encountered in proper habitat at the given season.

U = Uncommon: Infrequently detected in suitable habitat. May occur in small numbers or only locally in the given season.

R = Rare: Applies to species that are found in very low numbers.

"Numbers" indicate the number of individuals observed during the field survey work.

Status Codes (birds only):

M = Migrant: Uses the site for brief periods of time, primarily during the spring and fall months.

R = Year-round resident: Probable breeder on-site or in the vicinity.

S = Spring/summer resident: Probable breeder on-site or in the vicinity unless combined with transient status.

T = Transient: Uses site irregularly in summer but unlikely to breed. Not a true migrant and actual status often poorly known.

W = Winter visitor: Does not breed locally.

V = Casual vagrant: Not expected; out of normal geographic or seasonal range and by definition rare.

Common Name	Scientific Name	Habitat	Abundance	Status
BIRDS				
Falconidae (Caracaras and Falcons)				
American kestrel	*Falco sparverius*	U, G	C	R
Charadriidae (Plovers and Relatives)				
killdeer	*Charadrius vociferous*	G	C	R
Columbidae (Pigeons and Doves)				
mourning dove	*Zenaida macroura*	U,V, G	C	R
Trochilidae (Hummingbirds)				
Anna's hummingbird	*Calypte anna*	V	C	R
Tyrannidae (Tyrant Flycatchers)				
black phoebe	*Sayornis nigricans*	V,G	C	R
western kingbird	*Tyrannus verticalis*	V	C	M, S
Corvidae (Jays, Magpies, and Crows)				
American crow	*Corvus brachyrhynchos*	FO	A	R
Aegithalidae (Bushtit)				
bushtit	*Psaltriparus minimus*	V,G	C	R
Fringillidae (Finches)				
house finch	*Carpodacus mexicanus*	V	A	R
MAMMALS				
Didelphidae (American Opossums and Opossums)				
* Virginia opossum	*Didelphis virginiana*	V		
Geomyidae (Pocket Gophers)				
Botta's pocket gopher	*Thomomys bottae*	G		

Appendix E
Cultural Resources Report

PHASE 1 CULTURAL RESOURCES STUDY

PROPOSED MATERIALS RECOVERY FACILITY AND TRANSFER STATION PROJECT, CITY OF IRWINDALE, LOS ANGELES COUNTY, CALIFORNIA

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Baldwin Park, California, 7.5-minute USGS topographic quadrangle
PN 15980

October 2009

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MANAGEMENT SUMMARY

At the request of the Harvey Consulting Group, LLC & Harvey-Meyerhoff Consulting Group (HCG, LLC/HMCG), ASM Affiliates, Inc. (ASM), undertook a cultural resources study as part of California Environmental Quality Act (CEQA) requirements for the proposed Irwindale Materials Recovery Facility and Transfer Station Project. The project area is located on the Baldwin Park, California, 7.5-minute USGS topographic quadrangle, in Township 1 South, Range 10 West, Section 6. This report generally follows the *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Office of Historic Preservation 1990). This study included a records search at the South Central Coastal Information Center (SCCIC) at California State University Fullerton, historical background research, consultation with the Native American Heritage Commission (NAHC), and an intensive pedestrian survey of the project area.

No prehistoric or historic cultural resources were identified during the survey, and no further cultural resources work is recommended. It should be noted, however, that the results of the historical background research indicated that the property may have been part of the United Concrete Pipe Corporation, which was established in 1936 and demolished in 1990. As such, there may be remnants of the buildings and machinery associated with this corporation just below the surface. As such, it is recommended that in the event that any previously undetected historic (or archaeological) resources are encountered during project implementation, all work should cease and a qualified archaeologist should be contacted to evaluate the nature and significance of any such discoveries.

1. PROJECT DESCRIPTION

The proposed project includes a General Plan Amendment, in addition to a Development Agreement, Site Plan and Design Review Permit, and Zoning Code Amendment to allow for the construction and operation of a Materials Recovery Facility and Transfer Station (with a fueling facility/convenience store that is open to the public) on a 17.22 acre site at the northwest intersection of Live Oak Avenue and Arrow Highway within the City of Irwindale (Figures 1 and 2). The Assessor's Parcel Number is 8535-001-911. The irregularly shaped triangular site is unimproved, and is bordered on the south by Live Oak Avenue, on the east by an existing Los Angeles County Department of Water and Power (LACDWP) easement, on the northeast by Arrow Highway, and on the west and northwest by an existing business park. The project site is also crossed by a LACDWP transmission easement along the south side totaling approximately 2.84 acres of the total site area. The project site is also bordered on the north side (adjacent to Arrow Highway) by property owned by the United States Army Corps of Engineers.



Figure 1. Project vicinity map.

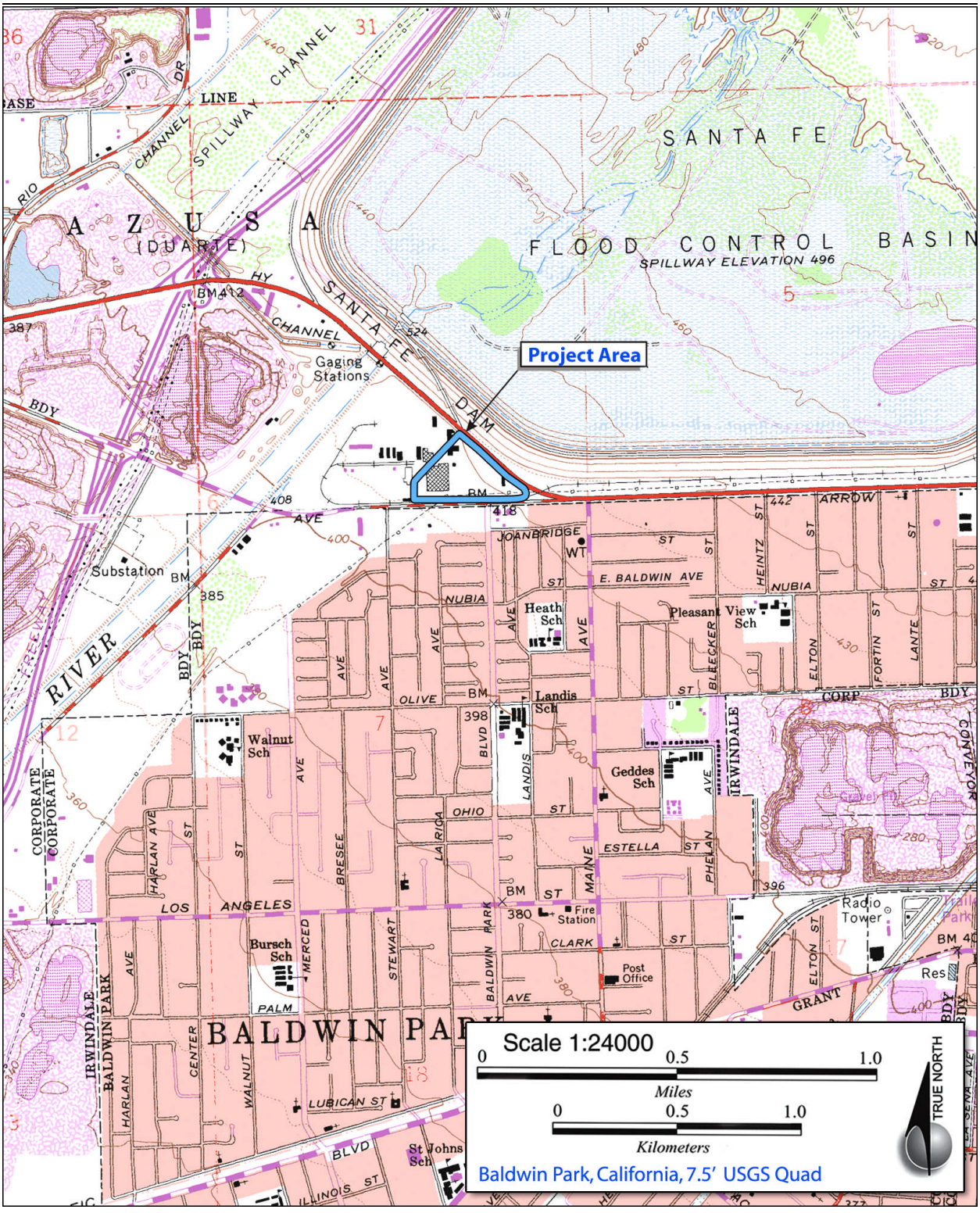


Figure 2. Project location map.

SCOPE OF WORK

HCG, LLC/HMCG contracted with ASM to conduct a Phase I cultural resources study for the Irwindale Materials Recovery Facility and Transfer Station Project. The study included cultural resources literature and file searches at the SCCIC, background historical research at various Los Angeles repositories, NAHC and Native American consultation, a pedestrian field survey, and preparation of this technical report detailing the findings of the investigation and providing management recommendations for the project.

REGULATORY REQUIREMENTS

The following contains a discussion of the applicable laws, ordinances, and regulations that govern cultural resources and that must be met prior to and during the proposed project under CEQA. The report is intended to satisfy the requirements of CEQA regulations. CEQA requires that the lead agency of a project determine whether a project may have a significant effect on one or more historical resources. A "historical resource" is defined as a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR) (*California Public Resources Code*, Section 21084.1); a resource included in a local register of historical resources (Section 15064.5[a][2]); or any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant (14 *California Code of Regulations* §15064.5, Section 15064.5[a][3]).

The Public Resources Code (PRC) and the CEQA statutes were used as the basic guidelines for the cultural resources study. CEQA requires that all private and public activities that are not specifically exempted be evaluated against the potential for environmental damage, including effects to historical resources. Historical resources are defined as "any object, building, structure, site, area, or place which is historically significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (Division I, Public Resources Code, Section 5021.1(b)). Lead agencies have a responsibility under Section 5024.1 to evaluate historical resources according to California Register of Historical Resources (CRHR) criteria prior to making a finding as to a proposed project's impacts to historical resources.

CEQA guidelines provide that a project that demolishes or alters those physical characteristics of a historical resource that convey its historical significance (i.e., its character-defining features) can be considered to materially impair the significance of the resource. Generally, a resource shall be considered to be "historically significant" if the resource meets the criteria for listing on the CRHR (Public Resource Code SS5024.1, Title 14 CCR, Section 4852), which consist of the following:

(1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or

(2) It is associated with the lives of persons important to local, California, or national history; or
(3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values; or
(4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

The purpose of this study is to evaluate whether any cultural resources are exposed on the surface of the project area and whether there is a potential for subsurface deposits. If resources are discovered, management recommendations would include evaluating the resources for CRHR eligibility.

PROJECT PERSONNEL

This cultural resources study was directed by ASM Principal Investigator Jill K. Gardner, Ph.D., RPA, who meets the Secretary of Interior's Standards and Guidelines for Archaeology (National Park Service 1983) for prehistoric archaeology. Dr. Gardner and ASM Project Historian Ms. Sarah Stringer-Bowsher undertook the cultural resources literature review and historical background research, respectively. ASM Associate Archaeologist Ms. Elizabeth Potter performed the cultural resources pedestrian survey. Ms. Stringer-Bowsher authored the historical background section of this report. This report will be filed with the HCG, LLC/HMCG, at ASM, and at the SCCIC. All field notes and other documentation related to the study are on file at ASM. This report was completed by Dr. Gardner in October 2009. For complete personnel qualifications, see Appendix A.

2. NATURAL AND CULTURAL SETTING

NATURAL SETTING

The project area is a vacant lot located immediately west of the intersection of Arrow Highway and Live Oak Avenue in the City of Irwindale. The Santa Fe Flood Control Basin is immediately to the north, across Arrow Highway. The San Gabriel River Channel is approximately one-half mile to the west. The project area contains several transmission towers and modern debris. The surface has been disturbed due to plowing and other recent activities. Several conifer trees were noted near the eastern end of the property, but the only other vegetation in the area is along the southernmost edge of the property, which is densely vegetated with native and nonnative trees and shrubs. Numerous waterworn cobbles and small boulders are scattered throughout the project area. The soils consist of very fine to coarse sands, with pea gravel present in places where the aeolian sand has been removed.

CULTURAL SETTING

Paleoindian Period

The Paleoindian period, sometimes referred to as the Paleocoastal tradition (see Jones and Klar 2007), is poorly documented for the southern California coast and the Channel Islands. The time span of this period has been the subject of some debate, particularly as it relates to the earliest occupation. Nevertheless, it is generally thought to date between about 13,000 and 9000 BP, although some scholars place the inception of the period at least 2,000 years earlier. The hallmark artifact of this period is the projectile point known as Clovis. Some examples of sites with a Paleoindian period occupation include Santa Rosa Island (the Arlington Springs woman at SRI-173; Johnson et al. 2002), San Miguel Island (Daisy Cave at SMI-261; Erlandson et al. 1996), SBA-1951 (a Clovis point; Erlandson et al. 1987), and the Surf site (radiocarbon dates at SBA-931; Glassow 1996).

During the Paleoindian period, populations were mostly likely hunter-gatherers who came into the region prior to about 11,000 years ago (Moratto 1984:162). They would have consisted of small initial groups with low population density (Glassow et al. 2007:192). Shellfish and fish were likely the primary food sources. Lakes, seashores, marshlands, estuaries, and riparian zones were the preferred habitation locales. Although the bow and arrow had not yet been introduced, the hunting technology probably included traps, nets, clubs, and spears (Moratto 1984:73).

Early Period

The Early period (ca. 9000–3000 BP) is known by a variety of terms depending on geographic location, including the Lake Mojave Complex (e.g., Campbell et al. 1937; Wallace 1962), the Western Pluvial Lakes Tradition (e.g., Bedwell 1973), the Western Lithic Co-Tradition (e.g.,

Davis et al. 1969), and the San Dieguito Complex (e.g., Gallegos 1991; Warren 1967). These types of sites are generally located near estuaries and river channels; inland sites dating to this period are typically situated near marshes or on terraces above ancient lake beds (e.g., Ciolek-Torrello 2006; Erlandson and Colten 1991). The artifact assemblages of this time period have contained crescents, choppers, hammerstones, large flake and core scrapers, drills, and gravers (e.g., Kowta 1969; Warren 1967). Several sites on the northern Channel Islands have been dated to this time period (Glassow et al. 2007:195).

Early period sites on the coast were adapted to wetland environments with abundant resources. The subsistence focus was on hunting, with an extensive flaked stone technology (Kowta 1969; Warren 1967). Ground stone implements are rare to absent at the earliest sites of the Early Period, but appear in abundance later in this period (during the Millingstone horizon), which may reflect a response to fluctuating environments through time. Millingstones were used to grind hard seeds from a variety of plants that were highly dependable and abundant resources. Kowta (1969) argued that the Millingstone horizon was the result of a long-term relationship between the desert and inland areas during the Early period.

Middle Period

During the Middle period (ca. 3000–850 BP), there was a substantial increase in population size and sociopolitical complexity. Marine mammals and fish became more important between about 2500 and 800 BP (Johnson 2000:307), and the diversity of fish species that were captured increased due to the introduction of the single-piece fishhook about 2,500 years ago (Glassow 1996:22).

In Middle period archaeological assemblages, the number of manos and metates decreases concomitant with an increase in mortars and pestles. Quarries and workshops for the production of stone tools have been discovered in the Santa Barbara Channel region (e.g., Conlee 2000), perhaps laying the foundation for later craft specialization. Harpoons began to be used along the California coast about 1,000 years ago, suggesting the existence of substantial watercraft by at least that time (King 1990; Gamble et al. 2002; Rick et al. 2002; Cassidy et al. 2004; Glassow et al. 2007). Bow and arrow technology also emerged in many parts of California about 2,000 to 1,500 years ago, which was a major technological innovation (e.g., Glassow et al. 2007:204; Yohe 1992, 1998). The manufacture of *Olivella* shell beads, as well as different types of bone and stone ornaments, fluoresced by about 2000 BP. By about 1500 years ago, villages became larger and more sedentary, such as those at Muwu (VEN-11), Simo'mo (VEN-24/26), and VEN-110 (Raab 1994). All of these factors led to increasing sociopolitical complexity that culminated dramatically during the subsequent Late period (Glassow et al. 2007:204).

Middle period society along the coast has been linked to coastal immigration from desert locations (Kowta 1969). Migration from the desert to the southern California coast by Takic groups appears to have occurred at this time, as evidenced by the appearance of a distinct cultural assemblage, including the bow and arrow, small projectile points, cremations, and pottery. The timing of this migration is unclear, although Koerper (1979) suggested that it may

have occurred as early as 500 BP, while Kowta (1969) argued that it occurred much earlier (ca. 3000 BP).

Middle/Late Transition Period

The Middle/Late Transition period (ca. 850–700 BP) was a time of environmental instability along with changing sociopolitical complexity. Scholars working on the Channel Islands since the late 1980s have argued that settlement disruptions, disease, and violence that are apparent in the archaeological record were the result of maritime subsistence distresses related to increased sea surface temperature between 850 and 700 BP (Arnold 1992a, 1992b, 1995; Raab and Larson 1997). These stresses may have been related to the environment fluctuations such as the Medieval Climatic Anomaly (MCA) (e.g., Arnold 1992a; Colten 1994; Gardner 2007; Glassow et al. 1988; Lambert 1993; Lambert and Walker 1991).

Basgall (1987) and Bouey (1987) argued that the intensification of acorn exploitation during the Middle/Late Transition period was a key factor in the emergence of cultural complexity in California. At the same time, there was a decline in marine productivity that eventually increased the manufacture of shell beads, which became the standard currency (Arnold 1991). Along with environmental deterioration brought on by the MCA, these factors eventually led to the disruption of settlement patterns, the development of an elite class that controlled the production of craft items (primarily bead ornaments and canoes), and deteriorating health conditions on the Channel Islands and California coast (Arnold 1992a; but see Raab and Larson 1997; Gamble 2005). Kennett and Kennett (2000:379) maintained that during this transitional period, hunter-gatherer cultures along the southern California coast rapidly became more socially and politically complex. They suggested that there was a strong relationship between unstable climatic conditions and sociopolitical and economic responses, including the intensification of fishing as well as increases in sedentism, violence, and trade (Kennett and Kennett 2000:379).

Late Period

During the Late period (ca. 700–150 BP), the manufacture of *Olivella* shell beads culminated in fully developed craft specialization on the southern California coast (e.g., Arnold 1987, 1992b). This has been verified by mission data analyzed by Johnson (2000), which described marriage practices and settlement patterns that "served as the basis for an exchange system that distributed goods throughout the Northern Bight and beyond" (Glassow et al. 2007:210). Fish increased in importance during this time, while shellfish and sea mammals decreased in importance. Hook-and-line kits, harpoons, and nets were used to capture the fish. During the same period of time, there was a reduction of long-distance trade. Village sites that may have been abandoned during the Middle-Late Transition period were reoccupied during the Late period (Glassow et al. 2007:207). This time also witnessed a decline in violence and a general improvement in health among island and coastal populations.

Some differentiation is apparent between coastal and inland sites during the Late period. Sites along the mainland coast seem to have decreased in number, although they increased in overall

size. In some neighboring regions, such as the Santa Monica Mountains, a greater diversity in temporary inland settlements emerged (Leonard 1971). There is evidence to suggest an increase in trade and interaction among mainland coastal, island, and inland settlements.

GABRIELINO ETHNOGRAPHY

The project area is located in an area that was occupied during the Late Prehistoric Period by the Gabrielino, who generally refer to themselves as Tongva (Kroeber 1925; Bean and Shipek 1978; Bean and Smith 1978). The term "Gabrielino" refers to those people who were under the control of the Spanish at Mission San Gabriel. The territory of the Gabrielino extended from northern Orange County to the San Fernando Valley in Los Angeles County. They are part of the Takic language family of the Uto-Aztecan linguistic stock, which also includes the Juaneño, Serrano, and Cahuilla in Orange, San Bernardino and Riverside counties.

The Gabrielino/Tongva arrived in the Los Angeles Basin sometime before 2,500 BP as part of the so-called Shoshonean Wedge from the Great Basin and gradually displaced the previous residents, who were probably Hokan speakers. Large, permanent villages were established in the along rivers and streams and in protected areas along the coast. Gabrielino territory ultimately encompassed the majority of the Los Angeles Basin, the coastal regions from Topanga Canyon to Aliso Creek, and the southern Channel Islands of San Clemente, San Nicholas, and Santa Catalina (Bean and Smith 1978:538–540). At their peak prior to contact, the Gabrielino population may have numbered as many as 10,000 individuals.

The Gabrielino were hunters and gatherers who lived in a resource-abundant environment that included mountains, foothills, valleys, deserts, and coasts. At least late in time, acorns were the staple food, supplemented by numerous plants, such as cactus, yucca, sage, and agave). Fresh and saltwater fish, shellfish, birds, insects, as well as large and small mammals, were common food resources (Johnston 1962; Bean and Smith 1978). Hunting was accomplished with bow and arrow technology, as well as traps, nets, blinds, throwing sticks, and slings. Fish were captured through the use of nets, traps, spears, harpoons, hooks, and poisons. For groups living along the Pacific shore, plank canoes and tule balsa canoes were used for fishing and travel (Moratto 1990:63). Foods were processed with the use of mortars and pestles, leaching baskets and bowls, knives, bone saws, and wooden drying racks. Steatite was used to manufacture ollas and cooking vessels (Kroeber 1925:629).

Gabrielino houses were large, circular domed structures consisting of willow poles thatched with tule. Other structures included sweathouses, menstrual huts, and ceremonial enclosures (Bean and Smith 1978). Kroeber (1925:621) considered the Gabrielino to have been the most complex and wealthiest group south of Tehachapi, with the exception of the Chumash.

REGIONAL HISTORY

Juan Rodriguez Cabrillo is considered to have been the first European to come into contact with the Gabrielino on the Channels Islands as he sailed along the California coast in 1542. In 1769, the first Europeans, led by Gaspar de Portolá, entered Los Angeles County. Mission San Gabriel in Los Angeles County was established in September 1771. The effects of mission influence on the native populations were immediate and devastating. Their traditional subsistence patterns and social customs were disrupted, and introduced diseases reached epidemic proportions, decimating Gabrielino populations (Johnston 1962:135). Interestingly, some Gabrielinos refused to surrender their traditional lifeways and escaped into the interior regions of California. On February 2, 1848, the Mexican-American War ended and the Treaty of Guadalupe Hidalgo established California as a United States possession.

The San Gabriel Mission used Irwindale as cattle grazing land. The area was later settled by farmers. The Irwindale Community was first settled by the families of Gregorio Fraijo and Fecundo Ayon during the 1850s. Beginning in the 1950s, the community became an important crushed rock and gravel producer. On August 6, 1957, the City of Irwindale, the 56th city of Los Angeles County, became incorporated (City of Irwindale 2009).

3. STUDY METHODS

CULTURAL RESOURCES RECORDS SEARCH

On October 26, 2009, ASM personnel requested that the SCCIC conduct a search of their literature and site records on file that pertain to the project area. The SCCIC conducted a review of records, reports, and historic maps in their files on October 27, 2009 (see Appendix B). The review included an examination of the Baldwin Park, California, 7.5-minute USGS topographic quadrangle to evaluate the project area for any sites recorded or cultural resources studies conducted within the project APE and within a one-mile radius of the project APE. In addition, the *California Points of Historical Interest*, *California Historical Landmarks*, *California Register of Historical Resources*, *National Register of Historic Places*, and *California State Historic Resources Inventory* were reviewed.

HISTORICAL BACKGROUND RESEARCH

ASM Project Historian Sarah Stringer-Bowsher conducted the historical background research at the City of Irwindale Library, Baldwin Park Historical Society, West Covina Regional Library, Cal Poly Pomona University Library, and Los Angeles Public Library.

NATIVE AMERICAN CONSULTATION

On October 30, 2009, ASM personnel requested a Sacred Lands File Search from the Native American Heritage Commission (NAHC). A response was received from NAHC Program Analyst Dave Singleton that same day (Appendix C). Mr. Singleton indicated that their file search had not identified any Native American sites in the APE. He also provided a list of Native American contacts for further information. ASM sent letters to all of the individuals and groups on the contact list with affiliation to the general project area that might have knowledge pertinent to cultural resources in the area (Appendix C includes only one of those letters as a template).

FIELD SURVEY

ASM Associate Archaeologist Elizabeth Potter completed the field survey on October 29, 2009. The entire property was examined on foot walking mostly north to south transects, at intervals of approximately 15 meters.

4. STUDY RESULTS

CULTURAL RESOURCES RECORDS SEARCH RESULTS

The results of the records search revealed that 10 cultural resources studies have been conducted within a mile of the project area (Table 1), none of which was performed directly within the project area. A study was recently conducted by Bonterra Consulting for the same project area (Brown and Maxon 2009), which also reported that there were no cultural resources present. The SCCIC also noted that there were 14 studies that are also on the Baldwin Park topographic quadrangle that were not mapped due to insufficient locational information but that may fall within the one-mile radius. No prehistoric sites or historic resources were identified during the records search.

Table 1. Previous Cultural Resources Studies within the One-Mile Records Search Radius of the Project Area

Report No.	Author(s)/Year	Title
LA-00186	Brock and Elliott 1988	A Cultural Resources Assessment for the Raiders Stadium Project, Irwindale, California
LA-00261	Rosen 1975	Evaluation of the Archaeological Resources and Potential Impact of the Proposed Removal and Recreation Developments at the Santa Fe Dam and Basin, Los Angeles County
LA-02412	Singer 1968	UCLA Archaeological Survey, Field Project Number UCAS-086
LA-02782	Boxt 1992	A Cultural Resource Assessment of the Three Potential Treatment Plant Sites in the Cities of Irwindale, Baldwin Park, and West Covina, Los Angeles County
LA-03101	White 1994	Cultural Resource Investigation of Eight Monitoring Well Locations for the San Gabriel Basin Demonstration Project, Los Angeles County
LA-03509	Cottrell et al. 1985	Cultural Resource Overview and Survey for the Los Angeles County Drainage Area Review Study
LA-03824	Greenwood and Assoc. 1995	Cultural Resources Report for the Baldwin Park Operable Unit Water Delivery Plan
LA-04880	Smith and Sriro 2000	Pavement Rehabilitation Along Route 605 within the Cities of Long Beach, Lakewood, Cerritos, Downey, Pico Rivera, Santa Fe Springs, Whittier, City of Industry, Baldwin Park, and Irwindale
LA-06281	Storey 2001	Highway Project Construction of Wheelchair Ramps at Ramona Blvd., Lower Azusa Road, Live Oak Avenue and Arrow Highway Along Route 605 in the City of Irwindale
LA-07245	Bonner 2005	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Vy-309-01, Monteleone Industrial, 14020 Live Oak Avenue, Baldwin Park

The SCCIC did not report any known cultural resources within the project APE or within a one-mile radius that are listed in the *National Register of Historic Places*, the *California Register of Historical Resources*, *California Points of Interest*, *California Inventory of Historic Resources*, or the *California State Historic Landmarks*.

HISTORICAL BACKGROUND RESEARCH RESULTS

Methodology

ASM's Project Historian Sarah Stringer-Bowsher contacted the City of Irwindale Librarian, Baldwin Park Historical Society, West Covina Regional Library, and Cal Poly Pomona University Library for information on the United Concrete Pipe Corporation. The digital photograph collection at the Los Angeles Public Library was also searched. The Whittier College Fairchild Aerial Photography Collection and building permits had already been reviewed as part of the Converse Consultants report (2009). Additional information on the United Concrete Pipe Corporation is available from the following resources: *Engineering-News Record*, *California Builder and Engineer*, *California Highways and Public Works*, *American Society of Engineers*, *Wastes Engineering*, and *Water Works Engineering*.

Brief History of the United Concrete Pipe Corporation

The United Concrete Pipe Corporation occupied the approximately 17-acre lot located at Live Oak Avenue and Arrow Highway from 1936 until 1990, when the facility was demolished (Converse Consultants 2009; Los Angeles Times 1936a). The corporation began as the Polich Construction Company established by Serbian Tom Polich in 1919 in Merced. After selling half of the company's interest to B. J. Ukropina and Steve Krai of Ventura, the company became Merced Concrete Pipe Company. In 1924, Polich merged with Ukropina and Krai's United Concrete Pipe Company, headquartered in Ventura, prompting another name change to United Concrete Pipe & Construction Company, Inc.

Utilizing concrete as the construction medium, the company manufactured and laid concrete pipe, constructed concrete bridges, laid concrete roads, poured foundations for buildings, and installed complete irrigation systems (Outcalt 1925). By 1936, the company had already become United Concrete Pipe Corporation and had constructed a new plant in Baldwin Park (present-day Irwindale), opting for that site instead of Azusa. A permit for the first factory unit on the 145-acre plant had been issued by February 1936. The Pacific Electric Railway spur was planned to provide necessary shipment transport. The new plant was scheduled to start manufacturing concrete pipe for the Metropolitan Water District's (MWD) 31-mile aqueduct from Parker Dam. While the plant may still have been under construction in May, the company was one of three working on the massive precast concrete pipe for the MWD's aqueduct. The Baldwin Park plant was specifically built for manufacturing pipe for this project (Los Angeles Times 1936a, 1936b, 1936c).

Representatives at the Baldwin Park plant bid on a series of water works projects, including a portion of the Coachella Canal, which was outbid (Los Angeles Times 1949). In May 1950, the plant won contracts for the first 25 miles of the 150-mile distribution system of the Friant-Kern Canal and by July of that year had won a bid as part of a southern California bidding conglomerate for construction of Trenton Dam in southwestern Nebraska (Los Angeles Times 1950). By 1951, the Baldwin Park plant was known for its high headwater pipes (Moody's Manual of Investments 1951). The plant earned another contract in August 1951, this time for

the construction of a two-mile stretch of the Santa Ana Freeway, which included the Rio Hondo Bridge (Los Angeles Times 1952). By 1954, United Concrete Pipe Corporation had become a subsidiary of U.S. Pipe & Foundry Company. During that year, the Baldwin Park plant won the contract for construction of the Davis Aqueduct of Reclamation's Weber Basin project in North Central Utah (Los Angeles Times 1954). By October 1957, the plant won another large contract for subaqueous reinforced concrete pipe for an effluent ocean outfall for the Los Angeles Hyperion sewage treatment plant (Los Angeles Times 1957).

While the company garnered a number of large water works and other projects, it faltered. On March 10, 1962, United Concrete Pipe Corporation had been indicted, along with other companies, for rigging bids and allocating sales of steel and concrete water pipes in 10 western states. By January 21, 1966, the Baldwin Park plant, which had been one of the primary producers of concrete pressure pipe in the state, had been indicted for price fixing in Texas (Los Angeles Times 1966). The plant survived the indictment and may have operated until 1990.

Known Information About the Baldwin Park Plant

The Baldwin Park plant grew between 1943 and 1958 to meet the demands of a successful operation of the United Concrete Pipe Corporation. The facility expanded to include a large industrial building, another building attached by external cables, a railway spur north of the large industrial building, and container sheds, as well as a few large sheds and other buildings. Building permits indicate that the corporation expanded the facility between 1957 and 1960 by adding a batch plant, craneway, bins, altering monorails, and adding associated buildings and structures, including cesspools and onsite sewer septic tanks. Changes to the facility between 1958 and 1987 included the expansion of the original industrial building and the other main building northeast of that original building. By 1987, the facility consisted of a main shop building, a personnel office, water well and pump, office building, craneway, ring plant, batch plant, boiler room, and a centrifugal machine. The facility was demolished in 1990 and graded in 1992 (Converse Consultants 2009:10-12).

FIELD SURVEY RESULTS

The survey area for this study consisted of the 17-acre City of Irwindale property that is located immediately west of the intersection of Arrow Highway and Live Oak Avenue (see Figure 3). The property is bound by Arrow Highway on the northeast, Live Oak Avenue on the south, a small business park facing Steward Avenue on the west, and a large parking lot facing Rivergrade Road on the northwest. The Santa Fe Dam overlooks the survey area from immediately north of Arrow Highway. The main channel of the San Gabriel River is located about one-half mile to the west.

ASM Associate Archaeologist Elizabeth Potter completed the field survey on October 29, 2009. The City of Irwindale granted permission for Ms. Potter to access the City-owned property by entering through a gap in the chain-link fence that surrounds the entire property.



Figure 3. Aerial map of the project area.

This gap is adjacent to a small concrete enclosure near the southeastern end of the property. The survey began at the southeastern corner of the property and generally ended at the western corner of the property. Transects were walked at intervals of approximately 15 meters north to south ending in the western portion of the project area. The project area consists of a primarily flat, empty, rock-strewn field, with several conifers within the central eastern end of the property. Most of the project area has recently been tilled and weeded, so visibility was very good.

No historic or prehistoric cultural resources were discovered during the survey. Large flat pieces of granite and numerous round and/or flat granite cobbles were examined, but none had been culturally modified. Two modern electrical towers were observed across the southern edge of the property area. There are also a few pieces of broken red brick, small pieces of thick asphalt, concrete fragments, and a few pieces of rusted metal within the survey area. No human remains were found within the project area.

5. RECOMMENDATIONS

CULTURAL RESOURCES

No prehistoric or historic cultural resources were discovered during this study, and no further cultural resources work is recommended. However, the historical background research indicated that a historic property, the United Concrete Pipe Corporation, was operating at this location early in the twentieth century and may have incorporated the boundaries of the current project area. Therefore, although there is currently no evidence of its existence, there is a slight possibility that historical resources related to this corporation may still be present just under the surface of the project area. As such, it is recommended that in the event that any previously undetected historic (or archaeological) resources are encountered during project implementation, all work should cease and a qualified archaeologist should be contacted to evaluate the nature and significance of any such discoveries. If a discovery proves to be significant, additional work (such as data recovery excavation) may be warranted.

HUMAN REMAINS

If human remains are discovered during project activities, the City of Irwindale Planning Department and the Los Angeles County Coroner's office shall be notified within 24 hours under state law (California Health and Safety Code § 7050.5) and all activities in the immediate area of the find shall cease until appropriate and lawful measures have been taken. If the Coroner determines that the remains are Native American, the NAHC shall also be contacted (California Public Resources Code § 5097.98). In accordance with Section 5097.98 of the *California Public Resources Code,* the NAHC shall designate a Most Likely Descendent, who may make recommendations concerning the disposition of the remains in consultation with the City and the project archaeologist.

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APPENDICES

APPENDIX A

Personnel Qualifications

Jill K. Gardner, Ph.D., RPA
Principal Investigator

Total Years of Experience: 18

Employment History:

2008	Principal Investigator, ASM Affiliates, Inc., Carlsbad, California
2006-2008	Principal Investigator/Operations Manager, Statistical Research, Inc., San Diego
2005-2006	Associate Director, Center for Archaeological Research, California State University Bakersfield, Bakersfield, California
2004-2005	Assistant Director, Center for Archaeological Research, California State University Bakersfield, Bakersfield, California
2001-2004	Staff Archaeologist II, Center for Archaeological Research, California State University Bakersfield, Bakersfield, California
1997-2006	Consultant with the Kern County Sheriff's Office, Bakersfield, California, performing forensic anthropological analysis
1997-1999	Staff Archaeologist, Southern San Joaquin Valley Historical Resources Information Center, California State University Bakersfield, Bakersfield, California
1996-1999	Staff Archaeologist I, Center for Archaeological Research, California State University Bakersfield, Bakersfield, California
1994-1996	Archaeological Laboratory Assistant, California State University Bakersfield, Bakersfield, California
1994-1996	Archaeological Technician, California State University Bakersfield, Bakersfield, California
1993-1994	Technical Assistant, processing of skeletal material for comparative faunal collection for Chaffey College, Rancho Cucamonga, California

Education:

Ph.D.	2006/Anthropology, University of Nevada, Las Vegas
M.A.	1998/Anthropology, California State University, Bakersfield
B.A.	1996/Anthropology (*magna cum laude*), California State University, Bakersfield

Professional Memberships or Affiliations:

Register of Professional Archaeologists, Member
Society for American Archaeology, Member
Society for California Archaeology, Member
Great Basin Anthropological Association, Member

Professional Profile:

Dr. Gardner has 18 years of experience in cultural resources management projects, archaeological fieldwork, research, and publication (books, articles, technical reports), primarily in western North America. She earned her Ph.D. in Anthropology with an emphasis

in archaeology, hunter-gatherers, and arid environments. Her research interests include California, Great Basin, and Mojave Desert prehistory; hunter-gatherer cultural development, including settlement and subsistence practices, migration patterns, and the role of environment in social complexity; and bioarchaeological techniques. Dr. Gardner has participated in, directed, and executed archaeological survey projects, test excavations, and data recovery excavations in the northern and southern San Joaquin Valley, the Mojave Desert, Egypt, and Jordan. She has experience with ground and flaked stone analyses, faunal studies, human osteology, and DNA analysis.

Dr. Gardner has conducted projects for the Federal government (e.g., Army Corps of Engineers, Bureau of Land Management, Bureau of Reclamation, Federal Highway Administration, Forest Service), the State of California (e.g., California Public Utilities Commission, California Department of Transportation, Department of Water Resources, Department of Parks and Recreation, Department of Forestry and Fire Protection), and numerous city, county, and local government agencies, as well as for private concerns. She has participated in and directed numerous survey, monitoring, testing, and data recovery projects, primarily in southern and central California.

Selected Project Experience:

Archaeological Monitoring for the SDG&E Ortega Highway Gas Pipeline Project, SDG&E and Southern California Gas Company, San Juan Capistrano, Orange County, California, March 2009 to present. As Principal Investigator for the joint SDG&E/Southern California Gas Company Ortega Highway Gas Pipeline Project in San Juan Capistrano, responsibilities entailed budgeting, scheduling, supervision, and production of a technical report of archaeological monitoring of large-scale trenching along the highway.

Cultural Resources Survey for the SDG&E Six-Pole Replacement Project, SDG&E, Julian, San Diego County, California, July 2009. As Principal Investigator, budgeted, scheduled, supervised, and produced a technical report for the survey for a pole replacement project in Julian, where a site was identified during the survey.

Cultural Resources Survey for the SDG&E C176 Fire Preparedness Project, SDG&E, Ramona, San Diego County, California, June to July 2009. As Principal Investigator, budgeted, scheduled, supervised, and produced a technical report for the survey and monitoring for a pole replacement project in Ramona, where a site was identified during the survey and later monitored.

Cultural Resources Survey for the SDG&E QC 11-Pole Replacement Project, SDG&E, Santa Ysabel, San Diego County, California, May to June 2009. As Principal Investigator, budgeted, scheduled, supervised, and produced a technical report for the survey of a pole replacement project in Santa Ysabel, where two sites were identified and mitigation measures were recommended.

Archaeological Monitoring for the SDG&E Tree Trimming Project in Cuyamaca Rancho State Park, VMA 467, SDG&E, San Diego County, California, April to June 2009. As Principal Investigator, budgeted, scheduled, supervised, and produced a technical report for the monitoring of tree trimming in Cuyamaca Rancho State Park, where two sites were identified and mitigation measures were recommended to protect the sites during tree-trimming activities.

Cultural Resources Survey for the SDG&E 12-Pole Replacement Project, SDG&E, Palomar Mountain, San Diego County, California, April to June 2009. As Principal Investigator, budgeted, scheduled, supervised, and produced a technical report for the survey of a pole replacement project on Palomar Mountain, where two sites were identified and mitigation measures were recommended.

Archaeological Survey of 27 Proposed Pole Locations and Underground Conduit for the Featherstone Camp Project, Cleveland National Forest, SDG&E, San Diego County, California, March to May 2009. As Principal Investigator, budgeted, scheduled, supervised, and produced a technical report for the survey and provided mitigation recommendations for three sites and two isolates that were documented during the survey.

Negative Cultural Resources Survey Report, Dye Road Extension Project, Ramona, County of San Diego and AMEC Earth & Environmental, Ramona, California, May to July 2009. As Principal Investigator, responsibilities included preparation of a cost estimate, budgeting, scheduling, supervision, and production of a technical report for a survey for a road extension project in Ramona.

Cultural Resources Survey for the Fuels Reduction Project on Palomar Mountain in San Diego County, California, Task Order Nos. 1, 2, and 3, Environmental Resource Solutions, Inc., San Diego, California, April 2009-present. As Principal Investigator, responsibilities include preparation of cost estimates, budgeting, scheduling, supervision, and production of a technical report for multiple task orders in this contract.

Negative Cultural Resources Survey Report, Gateway Project, Cities of National City and Chula Vista, California, Dudek and City of National City, California, April to May 2009. As Principal Investigator, responsibilities included preparation of a cost estimate, budgeting, scheduling, supervision, and production of a technical report for a survey for a commercial development in National City and Chula Vista.

Archaeological Monitoring for the SDG&E Encina-Penasquitos 230 kV Transmission Line Project from Carlsbad to Carmel Valley, San Diego County, California; and Guard Structure Pole Field Checks for the Encina-Penasquitos Reconductor Project (Part II), SDG&E, Carlsbad and Encinitas, California, March to April 2009. As Principal Investigator, budgeted, scheduled, supervised, and produced a technical report for 17 miles of monitoring and a field check of 45 guard structure pole locations. Eight sites were updated and mitigation measures were recommended.

Inventory and Evaluation of the Archaeological and Historical Resources of Yokohl Ranch, PBS&J, Tulare County, California, 2009-ongoing. As Principal Investigator, responsibilities currently include the reporting of results of test excavations at 30 sites prior to anticipated data recovery at some of these sites.

Data Recovery Investigations at Muscupiabit (CA-SBR-425/H) for the Burlington Northern & Santa Fe Railway Company, Cajon Subdivision Third Main Track Keenbrook to Summit Project, Cajon Pass, San Bernardino County, California, 2007-2008. As co-Principal Investigator, responsibilities included field supervision, budgeting, scheduling, and report writing.

General Overview Report on the Cultural Affiliation of the Black Butte Lake, U.S. Army Corps of Engineers, New Hogan Lake, Eastman Lake, Hensley Lake, Pine Flat Lake, and Lake Kaweah Properties, 2007-2008. As Senior Project Director, conducted literature research and co-authored report on studies at various reservoir construction projects in California in preparation for repatriation of cultural items to appropriate Native American groups.

A Heritage Resources Inventory for the Hazard Tree Removal Project in the Mountain Top and Front Country Districts of the San Bernardino National Forest, Southern California Edison, Sam Bernardino County, California, 2005-2006. As Principal Investigator/Project Director, planned, scheduled, managed accounting, and prepared technical report for the inventory and monitoring of ~2,600 acres in the San Bernardino National Forest.

Archaeological Monitoring for the Hazard Tree Removal Project in the Big Pines/Wrightwood Area, Southern California Edison, Santa Clara/Mojave River Ranger District of the Angeles National Forest, California, 2004-2005. As Principal Investigator/Project Director, planned, scheduled, managed accounting, and prepared technical report for inventory and monitoring during replacement of damaged trees.

Archaeological Evaluation Report for CA-MER-415, Wolfsen Road Rehabilitation Project, Caltrans Central Region, Merced County, California, 2004-2005. As Principal Investigator/Project Director, managed test excavations and evaluation of a site at the intersection of State Route 165 and the San Joaquin River.

Archaeological and Paleontological Assessment of the Antelope Transmission Project, Southern California Edison, Kern and Los Angeles counties, California, 2003-2005. As Principal Investigator/Project Director, responsible for planning, scheduling, budgeting, accounting, and supervision of field checks and model development to determine potential site locations for a new transmission line in the Antelope Valley.

A Heritage Resources Inventory for the Hazard Tree Removal Project in the San Jacinto District of the San Bernardino National Forest, Southern California Edison, 2003-2004. As Principal Investigator/Project Director, managed inventory and monitoring of 410 acres during replacement of damaged trees.

Archaeological Assessment of CA-MER-415, Extended Phase I Study, Wolfsen Road Rehabilitation Project, Caltrans Central Region, Merced County, California, 2002-2003. As Principal Investigator/Project Director, managed an extended Phase I study of a site at the intersection of State Route 165 and the San Joaquin River.

Archaeological Assessment of the Arroyo Pasajero Westside Detention Basin with Tulare Lakebed Flood Storage Project, California Department of Water Resources and the United States Bureau of Reclamation, Kings County, California, 2001-2003. As Principal Investigator/Project Director, managed survey and geologic trenching of the western shoreline of Tulare Lake near Kettleman City.

Elizabeth Potter
Associate Archaeologist

Total Years of Experience: 8

Employment History:

2007-Present	Associate Archaeologist and Marketing Coordinator (2007), ASM Affiliates, Inc., Carlsbad, California
2006	Assistant Archaeologist, ASM Affiliates Inc., Carlsbad, California
2006-2007	Assistant Archaeologist, EDAW, Barstow, California
2006	Assistant Archaeologist, EDAW, MCB, Camp Pendleton, California
2006	Project Scientist, Environmental Equalizers Inc., Carlsbad, California
2005-2006	Assistant Archaeologist, Environmental Services, Inc., St. Augustine, Florida
2000	Field Project Assistant, University of Central Florida, Caracol, Central America, Belize

Education:

B.A.	2003/Anthropology/Thomas Edison State College, Trenton, New Jersey
2000	Anthropology Program, University of Central Florida, Orlando, Florida

Additional Training:

2007	Adult CPR and First Aid Safety Certified
2008	OSHA 40-Hour HAZWOPER, 29 CFR 1910.120(e)

Professional Memberships:

2008	Society for American Archaeology

Professional Profile:

Ms. Potter has eight years of experience in archaeology and cultural resource management in California, Florida, Belize, and Hawaii and has surveyed, excavated, and recorded numerous prehistoric and historic sites. At the University of Central Florida in Orlando, she participated in excavations and evaluations of the Caracol site in Belize. She has extensive laboratory experience and invertebrate analysis. Her research focus is on prehistoric coastal populations from the east coast to Hawaii.

Ms. Potter has conducted surveys and excavations for numerous federal, state, county, and city agencies, including the United States Navy, the United States Marine Corps, the Bureau of Land Management, California State Parks, San Diego Gas and Electric, the County of San Diego, and the City of San Diego. Ms. Potter has co-authored several technical reports for field projects in Florida and California.

Selected Project Experience:

Archaeological Monitoring for the Encina-Penasquitos Transmission Line, SDG&E, Del Mar and Carlsbad, California, 2008. As an Associate Archaeologist, monitored drilling and trenching for construction of an SDG&E transmission line.

Archaeological Monitoring for the Ten Fifty B Street project, Affirmed Housing Group, San Diego, California, 2008. Monitored excavation for a subterranean parking structure in downtown San Diego in compliance with the MMRP regulations.

Archaeological Excavation for Installation of Storage Ponds, Ramona Municipal Water District, Ramona, California, 2008. As Crew Chief, conducted field excavations; shovel test pits and control test units to determine presence of subsurface artifacts associated with the bedrock milling sites.

Archaeological Survey for Caltrans Interstate 5 widening project, CalTrans, Carlsbad, California, 2008. As an Associate Archaeologist, surveyed the Agua Hedionda Lagoon biomitigation parcels for cultural resources.

Archeological Monitoring for MCAS Miramar Site 5, Parsons Infrastructure and Technology, Miramar, California, 2008. As an Associate Archaeologist, monitored exploratory trenching work to determine the presence or absence of intact historical resources and evaluation of the site's eligibility to the National Register of Historic Places.

Archaeological Monitoring, Division to Naval Station Metering Switchyard Reconductor and Upgrade, SDG&E, National City and San Diego, California, 2008. As an Associate Archaeologist, monitored all phases from Division Substation to Naval Station Metering along Harbor Drive between Vesta Street and Civic Center Drive.

Archaeological Testing for the CPEN 3,500 Acres on the Horno/Ammo Burn Survey, MCB Camp Pendleton, California, 2008. As Associate Archaeologist, conducted a survey in the recent burn areas to assess existing site boundaries and document newly identified sites.

Evaluation of 30 Archaeological Sites in the Upper Las Pulgas Corridor, MCB Camp Pendleton, California, 2007. As Crew Chief, conducted excavation of 30 sites to determine their eligibility for the National Register.

Archaeological Monitoring of the 6746 Miguel Transmission Line, San Diego Gas & Electric Company, Bonita, California, 2007. As Associate Archaeologist, conducted a pedestrian survey to relocate previously recorded sites and monitored mechanical excavations.

Archaeological Monitoring for the San Mateo Ag Fields, Department of the Navy, MCB Camp Pendleton, San Diego County, California, 2007. As Crew Chief, assisted in supervising a crew of six archaeologists for the evaluation of four sites.

Monitoring for the Rose Canyon Mitigation Project, City of San Diego Metropolitan Wastewater Department, San Diego, California, 2007. As Associate Archaeologist, monitored mechanical excavations of two areas adjacent to known archaeological sites.

Archaeological Survey for Quarters A, Shaw Environmental, Naval Base Point Loma, San Diego County, California, 2007. As Associate Archaeologist, conducted a two-day GPR survey of a potential historic site on Naval Base Point Loma.

Testing of the North County Transit District (NCTD) Bridge Replacement Project, BRG Consulting, Inc., San Diego County, California, 2007. As Field Archaeologist, participated in testing at project areas located within the NCTD ROW in the cities of Cardiff, Solana Beach, Del Mar, and Sorrento Valley.

Archaeological Testing for the Seeley Windmill, California Department of Parks and Recreation, Old Town San Diego, California, 2007. As Associate Archaeologist, conducted testing of the location of the historic windmill and an associated well.

Archaeological Testing of the P-159 Red Beach Access, TEC Inc., MCB Camp Pendleton, San Diego County, California, 2007. As Field Archaeologist, conducted intensive testing at Interstate-5 and Las Flores Creek.

Phase I Inventory of 2,510 Acres in Priority Areas on Edwards Air Force Base, Earth Tech Inc., Kern County, California, 2006. As Field Archaeologist, participated in a Class III inventory of over 2,500 acres; this work resulted in the discovery of 81 sites (44 historic, 37 prehistoric) and a variety of isolated finds.

Testing Program for the Canyon Trails, City of Hemet, Riverside County, California, 2006. As a Field Archaeologist, participated in assessing presence and conducting evaluation and recording of known prehistoric and historic sites within the proposed Canyon Trails Project.

Phase I Cultural Resource Survey of 1,490 Acres at Wilson Canyon, North Range, China Lake Naval Air Weapons Station, Ridgecrest, Inyo County, 2006. As Field Archaeologist, participated in survey of 1,490 acres in an undeveloped area of the North Range.

Caltrans Interstate 5 Extended Phase I and Phase II Testing, Caltrans District 11, San Diego, California, 2006. As Field Archaeologist, tested two archaeological sites located west of I-5, on land proposed for highway widening and sound barrier construction.

APPENDIX B

Cultural Resources Records Search Results

South Central Coastal Information Center
California State University, Fullerton
Department of Anthropology MH-426
800 North State College Boulevard
Fullerton, CA 92834-6846
657.278.5395 / FAX 657.278.5542
anthro.fullerton.edu/sccic.html - sccic@fullerton.edu
California Historical Resources Information System
Orange, Los Angeles, and Ventura Counties

October 27, 2009 SCCIC # 9955.6849

Ms. Jill K. Gardner
ASM Affiliates
2034 Corte Del Nogal
Carlsbad, California 92011
(760) 804-5757

RE: Record Search Results for the City of Irwindale's Materials Recovery Facility and Transfer Station Project (ASM # 15980) Located in the County of Los Angeles, California

Dear Ms. Gardner,

As per your request received on October 26, 2009, an expedited records search was conducted for the above referenced project. The search includes a review of all recorded archaeological sites within a 1-mile radius of the project site as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest (PHI), the California Historical Landmarks (CHL), the California Register of Historical Resources (CR), the National Register of Historic Places (NR), and the California State Historic Resources Inventory (HRI) listings were reviewed for the above referenced project. The following is a discussion of the findings.

Baldwin Park, CA. USGS 7.5' Quadrangle

ARCHAEOLOGICAL RESOURCES:

No archaeological sites have been identified within a 1-mile radius of the project site. No archaeological sites are located within the project site. No isolates have been identified within a 1-mile radius of the project site. No isolates are located within the project site.

HISTORIC RESOURCES:

Copies of our historic maps - Pomona (1894 and 1927) 15' USGS - are enclosed for your review.

The California Point of Historical Interest of the Office of Historic Preservation, Department of Parks and Recreation, lists no properties within a 1-mile radius of the project site.

The California Historical Landmarks of the Office of Historic Preservation, Department of Parks and Recreation, lists no properties within a 1-mile radius of the project site.

The California Register of Historic Places lists no properties within a 1-mile radius of the project site. These are properties determined to have a National Register of Historic Places Status of

1 or 2, a California Historical Landmark numbering 770 and higher, or a Point of Historical Interest listed after 1/1/1998.

The National Register of Historic Places lists no properties within a 1-mile radius of the project site.

The California Historic Resources Inventory lists no properties that have been evaluated for historical significance within a 1-mile radius of the project site.

PREVIOUS CULTURAL RESOURCES INVESTIGATIONS:

Twelve studies (LA186, LA261, LA2412, LA2782, LA3101, LA3416, LA3509, LA3824, LA3826, LA4880, LA6281, and LA7245) have been conducted within a 1-mile radius of the project site. Of these, none are located within the project site. There are fourteen additional investigations located on the Baldwin Park 7.5' USGS Quadrangle that are potentially within a 1-mile radius of the project site. These reports are not mapped due to insufficient locational information.

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you **do not include** resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at 657.278.5395 Monday through Thursday 9:00 am to 3:30 pm.

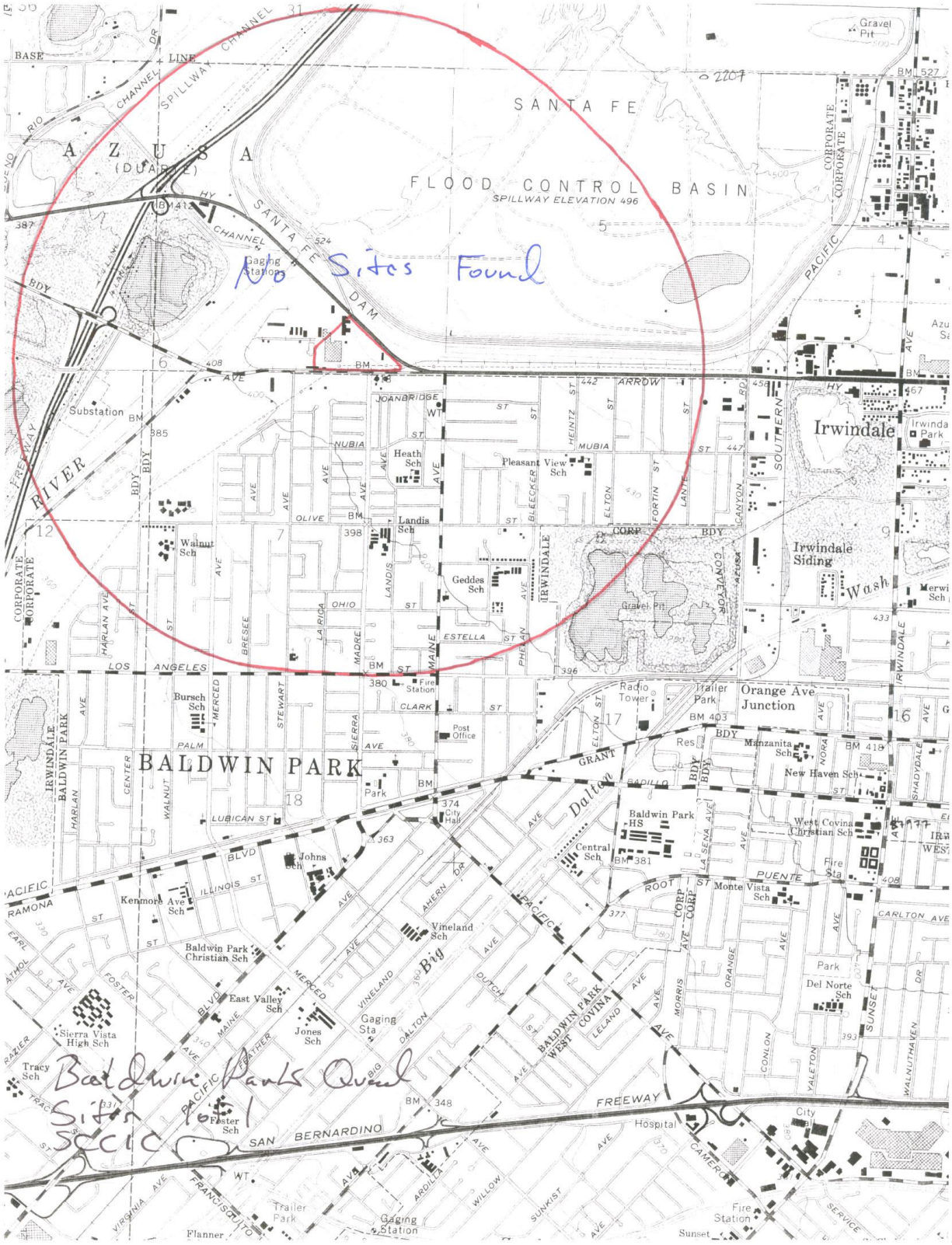
Should you require any additional information for the above referenced project, reference the SCCIC number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

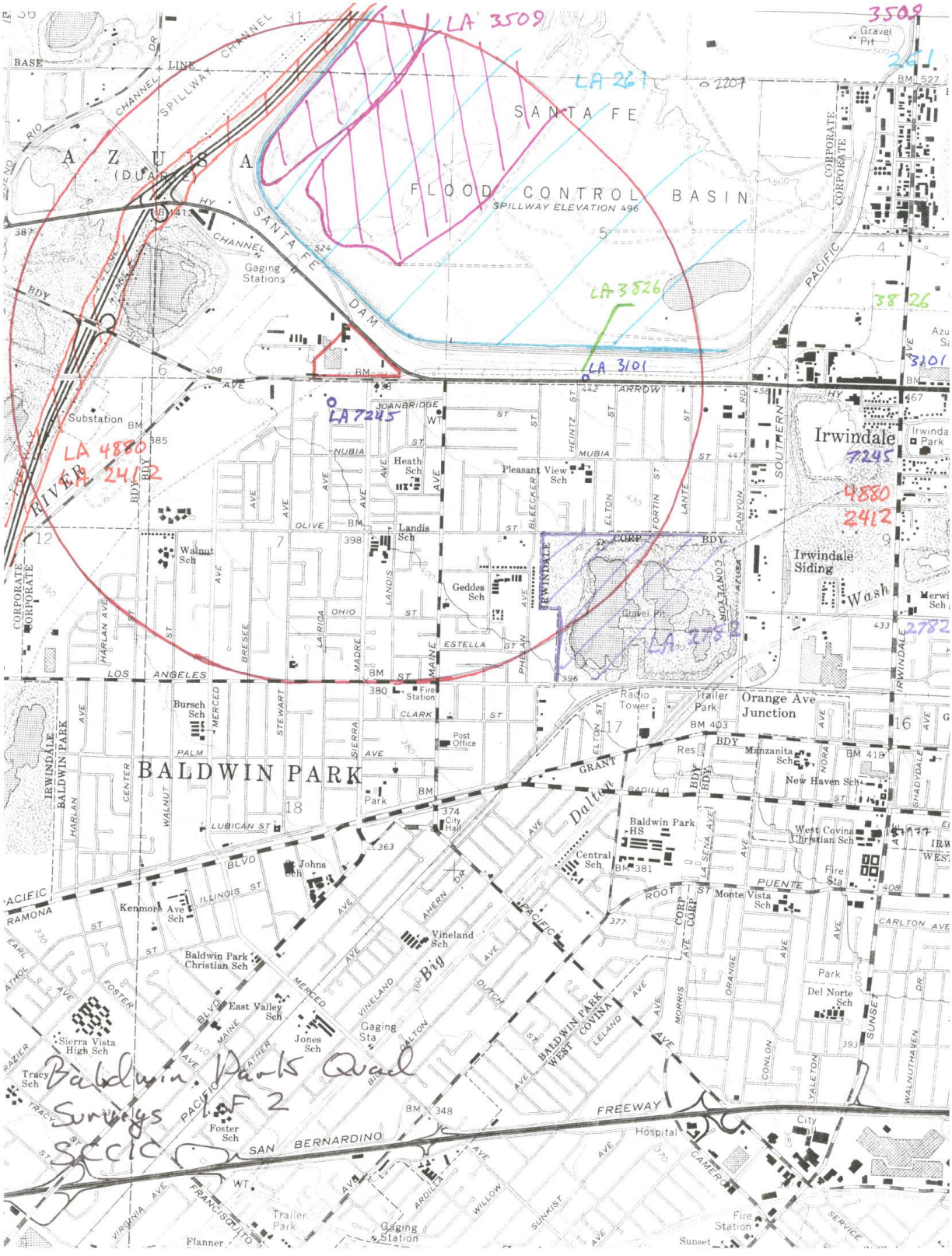
Sincerely,
SCCIC

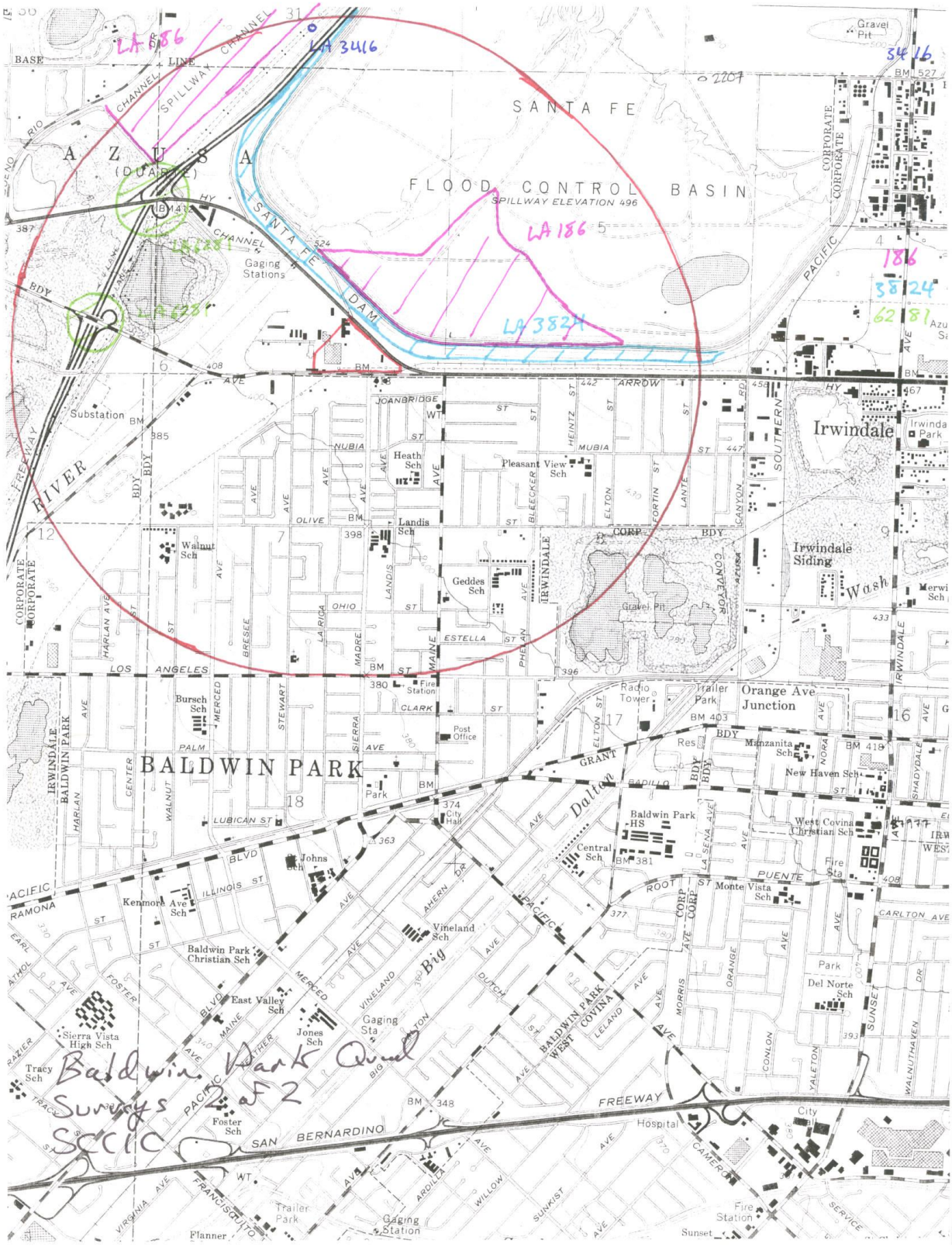
Thomas David Shackford
Assistant Coordinator

Enclosures:

(X) Maps – Baldwin Park 7.5' USGS Quadrangle, Pomona 15' USGS Quadrangle – 7 pages
(X) Bibliography – 7 pages
(X) HRI – 4 pages
(X) National Register Status Codes – 1 page
(X) Confidentiality Form
(X) Invoice # 9955.6849


No Sites Found
SANTA FE
FLOOD CONTROL BASIN
SPILLWAY ELEVATION 496
AZUSA
(DUARTE)
SPILLWAY CHANNEL
SANTA FE DAM
Gaging Station
Substation
RIVER
FREEWAY
Heath Sch
Pleasant View Sch
Landis Sch
Walnut Sch
Geddes Sch
Gravel Pit
Irwindale
Irwindale Siding
Wash
Trailer Park
Orange Ave Junction
Radio Tower
Fire Station
Post Office
BALDWIN PARK
Park
City Hall
Bursch Sch
Johns Sch
Kenmore Ave Sch
Baldwin Park Christian Sch
Vineland Sch
East Valley Sch
Jones Sch
Sierra Vista High Sch
Tracy Sch
Foster Sch
Baldwin Park HS
Central Sch
West Covina Christian Sch
Monte Vista Sch
Del Norte Sch
New Haven Sch
Manzanita Sch
Hospital
Flanner
Sunset
Baldwin Park Quad
Sites for SCCIC
BASE LINE
SAN BERNARDINO FREEWAY
PACIFIC
SOUTHERN PACIFIC
ARROW HY
RAMONA BLVD
LOS ANGELES AVE
PUENTE ST
CARLTON AVE


LA 3509
LA 261
SANTA FE
FLOOD CONTROL BASIN
SPILLWAY ELEVATION 496
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LA 3101
LA 7245
LA 4880
RIVER
LA 2412
LA 2782
AZUSA
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PUENTE ST
ROOT ST
CARLTON AVE
OLIVE ST
NUBIA ST
MUBIA ST
OHIO ST
ESTELLA ST
LOS ANGELES ST
Baldwin Park Quad
Surveys
SCCIC
2 of 2


LA 186
LA 3416
LA 3824
LA 2381
LA 2387
SANTA FE
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SPILLWAY ELEVATION 496
AZUSA
(DUARTE)
SANTA FE DAM
Gaging Stations
Gravel Pit
Substation
RIVER FREEWAY
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Pleasant View Sch
Landis Sch
Walnut Sch
Geddes Sch
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MUBIA
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GRANT
PUENTE
ROOT
CARLTON AVE
Big Dalton
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BM 408
BM 454
BM 467
BM 433
BM 396
BM 447
BM 442
BM 420
BM 360
BM 340
BM 370

APPENDIX C

Native American Heritage Commission Correspondence

ASM affiliates
archaeology
history
architectural history
ethnography

October 28, 2009

Mr. Dave Singleton
California Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814
Via fax: (916) 657-5390

Re: City of Irwindale's Materials Recovery Facility and Transfer Station Project, County of Los Angeles, California

Dear Mr. Singleton,

ASM Affiliates, Inc. (ASM) is conducting an archaeological study of the City of Irwindale's Materials Recovery Facility and Transfer Station Project, located in County of Los Angeles, California, California. ASM is conducting this study in accordance with City of Irwindale CEQA guidelines. ASM has conducted a records search with the South Central Coastal Information Center in Orange County. I am writing to inquire if you have registered any cultural resources, traditional cultural properties, or areas of heritage sensitivity within this proposed project area.

Our investigation will include contact with local tribal entities in a manner that ensures complete confidentiality. We request that you send along a listing of the appropriate individuals to make contact with related to this project. Please submit your response to me at our Carlsbad office, listed above. Feel free to call, write, or e-mail if you have any questions.

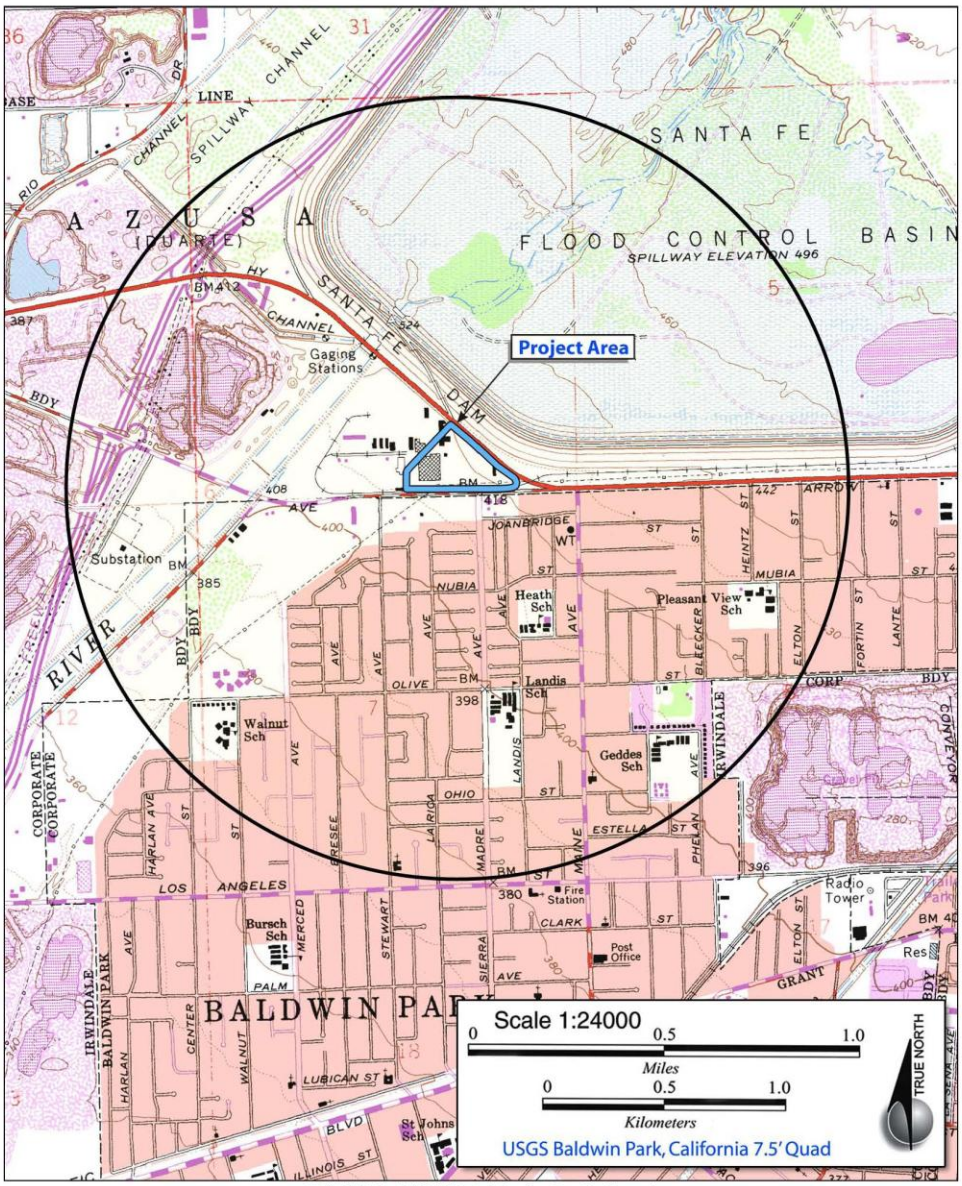
Sincerely,

Elizabeth Potter

Elizabeth Potter
epotter@asmaffiliates.com

Attachment: map of project parcel

Your Requested Information:
County – Los Angeles
USGS Quad – Baldwin Park
Township- 1 South
Range-10 West
Section – 6



USGS 1:24000 Baldwin Park Quad

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

October 30, 2009

Ms. Elizabeth Potter
ASM AFFILIATES
2034 Corte del Nogal
Carlsbad, CA 92011

Sent by FAX to: 760-804=5755
Number of pages: 3

Re: Request for a Sacred Lands File Search and Native American Contacts List for a **Proposed. City of Irwindale's Materials Recovery Facility and Transfer Station Project;** located in Los Angeles County, California

Dear Ms. Potter:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources (c.f. CA Public Resources Code §21070), was able to perform a record search of its Sacred Lands File (SLF) for the affected project area (APE) requested. The California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177)) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the 2007 CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." The NAHC SLF search **did not indicate** the presence of several Native American cultural resources within one-half - mile radius of the proposed projects (APE) planting sites.

This letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and individuals as 'consulting parties' under both state and federal law.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes and interested Native American individuals that the NAHC recommends as 'consulting parties,' for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We recommend that you contact persons on the attached list of Native American contacts. In particular, we urge consultation with Keith Turner, Jim Redmoon and Bob Pennell. A Native American Tribe or Tribal Elder may be the only source of information about a cultural resource.. Furthermore we suggest that you contact the California Historic Resources Information System (CHRIS) at the Office of Historic Preservation Coordinator's office (at (916) 653-7278, for referral to the nearest Information Center of which there are 11..

Consultation with tribes and interested Native American consulting parties, on the NAHC list ,should be conducted in compliance with the requirements of federal NEPA (42 U.S.C. 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 [f)]*et seq),* and NAGPRA (25 U.S.C. 3001-3013), as appropriate. .

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

The response to this search for Native American cultural resources is conducted in the NAHC Sacred Lands Inventory, established by the California Legislature (CA Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10) although Native Americans on the attached contact list may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the under Section 304 of the NHPA or at the Secretary of the Interior' discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C, 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contacts List (NOTE: we further recommend that other forms of 'proof of mailing or proof of contact be utilized instead of 'Return Receipt Requested' Certified or Registered Mail.) Further, we suggest a follow-up telephone call to the contacts if the replies are not received or need clarification.

Native American Contacts
Los Angeles County
October 30, 2009

LA City/County Native American Indian Comm
Ron Andrade, Director
3175 West 6th Street, Rm. 403
Los Angeles , CA 90020
(213) 351-5324
(213) 386-3995 FAX

Gabrielino Tongva Indians of California Tribal Council
Robert F. Dorarnae, Tribal Chair/Cultural Resources
P.O. Box 490 Gabrielino Tongva
Bellflower , CA 90707
gtongva@verizon.net
562-761-6417 - voice
562-925-7989 - fax

Ti'At Society
Cindi Alvitre
6515 E. Seaside Walk, #C Gabrielino
Long Beach , CA 90803
calvitre@yahoo.com
(714) 504-2468 Cell

Gabrielino-Tongva Tribe
Bernie Acuna
501 Santa Monica Blvd, # 500 Gabrielino
Santa Monica , CA 90401
(310) 587-2203
(310) 428-7720 - cell
(310) 587-2281

Tongva Ancestral Territorial Tribal Nation
John Tommy Rosas, Tribal Admin.
, Gabrielino Tongva
tattnlaw@gmail.com
310-570-6567

Gabrieleno Band of Mission Indians
Andy Salas, Chairperson
PO Box 393 Gabrieleno
Covina , CA 91723
gabrielenoindians@yahoo.com
626-926-4131
(213) 688-0181 - FAX

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
PO Box 693 Gabrielino Tongva
San Gabriel , CA 91778
(626) 286-1262 -FAX
(626) 286-1632
(626) 286-1758 - Home
(626) 286-1262 Fax

Gabrielino-Tongva Tribe
Linda Candelaria, Chairwoman
501 Santa Monica Blvd, # 500 Gabrielino
Santa Monica , CA 90401
(310) 587-2203
310-428-5767- cell
(310) 587-2281
lcandelaria1@gabrielinoTribe.org

Gabrielino Tongva Nation
Sam Dunlap, Tribal Secretary
P.O. Box 86908 Gabrielino Tongva
Los Angeles , CA 90086
samdunlap@earthlink.net

(909) 262-9351 - cell

This list is current only as of the date of this document.
Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. and federal NEPA (42 USC 4321-43351), NHPA Sections 106, 4(f) (16 USC 470(f) and NAGPRA (25 USC 3001-3013)

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed City of Irwindale's Materials Recovery Facility (MRF) and Transfer Station Project; located in Los Angeles County,

ASM affiliates
archaeology
history
architectural history
ethnography

October 30, 2009

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693
San Gabriel, CA 91778

Re: City of Irwindale's Materials Recovery Facility and Transfer Station Project, County of Los Angeles, California

Dear Mr. Morales,

ASM Affiliates, Inc. (ASM) is conducting a cultural resources study for the City of Irwindale's Materials Recovery Facility and Transfer Station Project, located in Los Angeles County, California. The subject property is shown in the attached figure. This study is being undertaken in accordance with City of Irwindale CEQA guidelines.

ASM has completed a records search at the South Central Coastal Information Center. A records search with the California Native American Heritage Commission identified no traditional cultural properties or areas of heritage significance within the project area.

We are contacting you to find out if you are aware of any issues of cultural concern regarding the area shown on the enclosed map. In particular, we would like to know if you have knowledge of any Traditional Cultural Properties, Sacred Sites, resource collecting areas, or any other areas of concern of which you wish us to be aware. We understand the need for confidentiality in these matters.

If you have any questions or concerns regarding the proposed project, we will contact you about the best way to include consideration of those concerns while maintaining confidentiality. You can contact ASM at the address and telephone number for our Carlsbad office, listed below, or myself at the e-mail address below. We appreciate any input you may have on this project, and understand that consultation is a private and ongoing process. Again, any information you provide us will remain confidential.

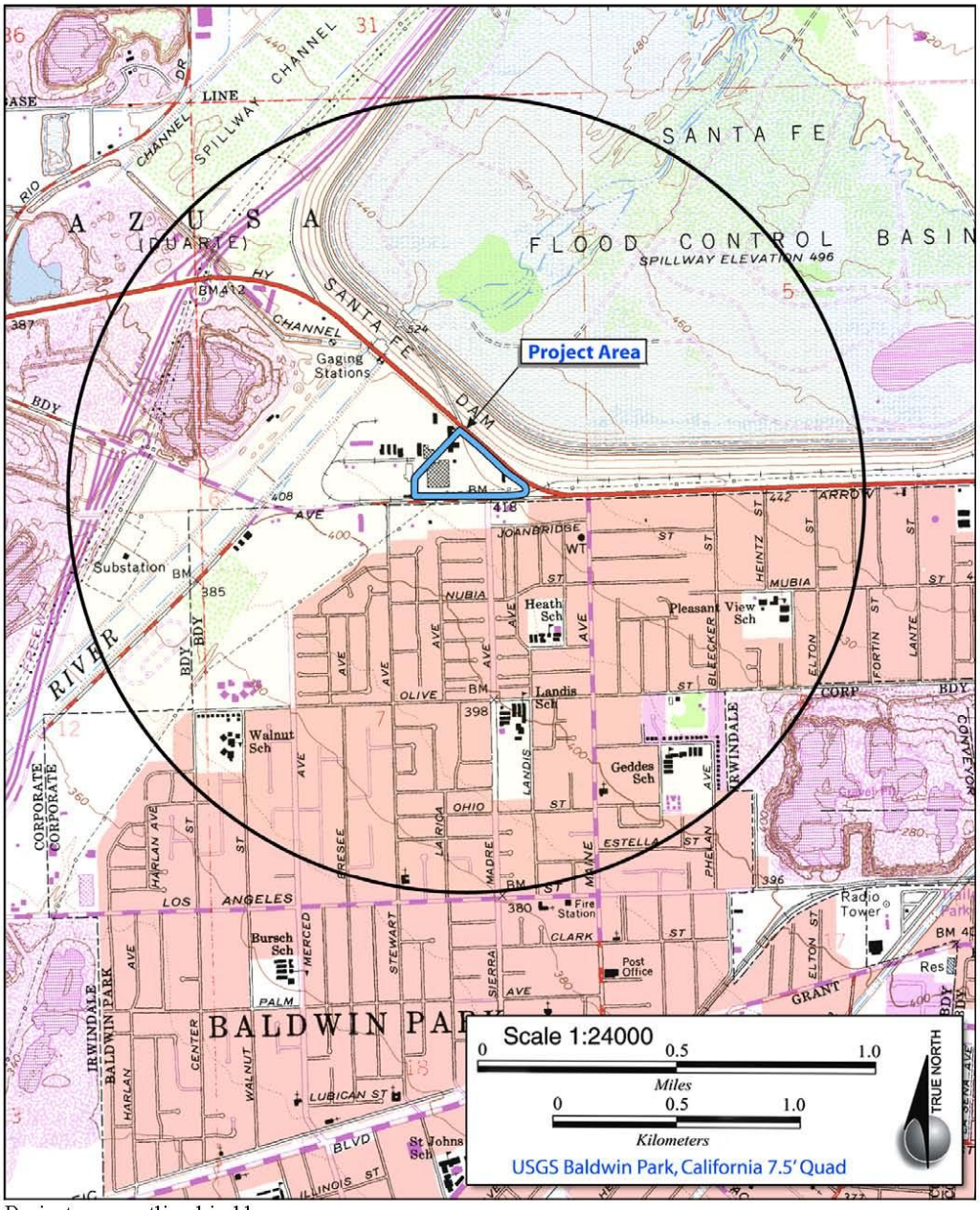
Sincerely,

Elizabeth Potter

Elizabeth Potter
epotter@asmaffiliates.com

Attachment: map of project area

2034 Corte del Nogal, Carlsbad, CA 92011 • 760-804-5757 • 760-804-5755-fax
260 S. Los Robles Ave., Suite 311, Pasadena, CA 91101 • 626-793-7395 • 626-793-2008-fax
120 Vine St., Reno, NV 89503 • 775-324-6789 • 775-324-9666-fax
www.asmaffiliates.com



Project area outlined in blue

7004 2820 0000 7939 2075

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com®

SACRAMENTO CA 95814

OFFICIAL USE

Postage	$ $1.52	0263
Certified Fee	$3.10	12
Return Receipt Fee (Endorsement Required)	$0.00	Postmark Here
Restricted Delivery Fee (Endorsement Required)	$0.00	
Total Postage & Fees	$ $4.62	06/26/2013

MAIN POST OFFICE PALM SPRINGS CA 92263 JUN 26 2013 USPS

Sent To NAHC

Street, Apt. No.; or PO Box No. 915 Capitol Mall, Rm 364

City, State, ZIP+4 Sacramento, CA 95814

PS Form 3800, August 2006 See Reverse for Instructions

TRIBAL CONSULTATION LIST REQUEST

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
(916) 657-5390 - Fax
E-mail -- nahc@pacbell.net

Project Title: Irwindale Materials Recovery Facility and Transfer Station

Local Government: City of Irwindale Contact Person: Paula Kelly

Email: paulakelly@ci.irwindale.ca.us Phone: (626) 430-2209

Street Address: 5050 N. Irwindale Avenue Fax: (626) 962-2018

City: Irwindale, California Zip: 91706

Project Location:

County: Los Angeles City/Community: City of Irwindale

Local Action Type:

___ General Plan ___ General Plan Element ___ Specific Plan

___ General Plan Amendment ____ Specific Plan Amendment

___ Pre-Planning Outreach Activity

Project Description:

NAHC Use Only

Date Received: _____

Date Completed _____

Native American Tribal Consultation lists are only applicable for consulting with California Native American tribes per Government Code Section 65352.3.

STATE OF CALIFORNIA

Tribal Consultation Guidelines

SUPPLEMENT TO GENERAL PLAN GUIDELINES

November 14, 2005

GOVERNOR'S OFFICE OF PLANNING AND RESEARCH



State of California
Arnold Schwarzenegger, Governor

Governor's Office of Planning and Research
Sean Walsh, Director
1400 Tenth Street
Sacramento, CA 95814
(916) 322-2318

Jan Boel, Chief Deputy Director

Terry Roberts, State Clearinghouse Director

Contributors: Scott Morgan, Senior Planner
Bridget O'Keeffe, Executive Fellow
Brent Jamison, Legislative Analyst
Stephanie Dougherty, Staff Assistant
Erin Larson, Project Analyst
Cuauhtemoc Gonzalez, Staff Assistant

November 2005

Please feel free to reproduce all or part of this document. You need not secure permission; we ask that you print it accurately and give credit to the Governor's Office of Planning and Research.

This document is available on the Internet at http://www.opr.ca.gov/SB182004.html.

Director's Message

November 14, 2005

The Governor's Office of Planning and Research (OPR) is proud to announce the publication of this November 2005 Supplement to the *General Plan Guidelines*. The 2005 Supplement (also known as Tribal Consultation Guidelines) provides advisory guidance to cities and counties on the process for consulting with Native American Indian tribes during the adoption or amendment of local general plans or specific plans, in accordance with the statutory requirements of Senate Bill 18 (Chapter 905, Statutes of 2004). It reflects recent changes to the California Public Records Act which will facilitate this consultation process.

It is our hope that this 2005 Supplement will be useful not only to city and county planning staffs for implementing the provisions of SB 18, but also to local elected officials, planning consultants, landowners, and tribal members who are involved in the general plan process.

In all of its work, OPR attempts to encourage more collaborative and comprehensive land use planning at the local, regional, and statewide levels. These goals are consistent with the goals of Senate Bill 18, which for the first time in the nation, requires cities and counties to consult with Native American tribes when adopting and amending their general plans or specific plans.

The development of this 2005 Supplement would not have been possible without the advice and assistance of many organizations and individuals, whose support OPR acknowledges and appreciates. These organizations and individuals include the Native American Heritage Commission and its staff, the members and representatives of numerous California Native American tribes, many city and county governments, state agency representatives, professional associations and academic institutions. We appreciate their assistance in preparing this 2005 Supplement, including participation at several meetings and public workshops.

OPR met the statutory deadline of March 1, 2005, to publish these guidelines by issuing interim guidelines on March 1. In developing the interim guidelines, OPR consulted with a wide range of stakeholders and experts. We consulted with city and county representatives (planners, legislative staff and legal counsels); tribal representatives and associations; staff of the Native American Heritage Commission (NAHC), including attendance at two NAHC commission meetings; federal agencies with experience in tribal consultation; academic institutions; and professional associations that deal with archaeological and cultural resource protection. In addition, we consulted with numerous tribal liaisons within state government and sought the input of the League of California Cities and the California State Association of Counties.

Based upon this consultation, OPR issued Draft Tribal Consultation Guidelines on February 22, 2005 for public review and comment. OPR conducted a public workshop on February 25, 2005, which was well attended and resulted in a productive discussion of the process envisioned by SB 18, as well as many specific recommendations for improvements to the 2005 Supplement.

In response to requests from many parties for additional time to consult with OPR regarding the 2005 Supplement, OPR continued to reach out to stakeholders for an additional 45 days to ensure that their interests were heard. Between March 1 and April 15, OPR held four meetings throughout the State to receive additional comments. The meetings were held in Klamath, Corning, Sonora, and Temecula. On April 15, OPR published the guidelines reflecting the comments and concerns expressed at those four meetings, as well as written comments received by OPR.

This November edition of the guidelines reflects recent changes to the Public Records Act that exempt from public disclosure certain documents pertaining to Native American cultural places.

We hope that you will find this 2005 Supplement to be an informative guide and a useful tool in the practice of local planning. I invite your suggestions on ways to improve OPR's *General Plan Guidelines* and this 2005 Supplement, as OPR continues to refine and update all of its guidance to city and county planning agencies.

Sean Walsh
Director, OPR

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Part A
SB 18 Context and Basic Requirements

Sections I through III of the 2005 Supplement provide background information to familiarize local government agencies with the intent of Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) and the importance of protecting California Native American traditional tribal cultural places. Local governments will be better prepared to enter into consultations with tribes if they have a basic knowledge of tribal concerns and the value of cultural places to tribes. The key provisions of SB 18 are also outlined in table and text form.

I. Introduction

This 2005 Supplement to the *2003 General Plan Guidelines* addresses the requirements of SB 18, authored by Senator John Burton and signed into law by Governor Arnold Schwarzenegger in September 2004. SB 18 requires local (city and county) governments to consult with California Native American tribes to aid in the protection of traditional tribal cultural places ("cultural places") through local land use planning. SB 18 also requires the Governor's Office of Planning and Research (OPR) to include in the *General Plan Guidelines* advice to local governments for how to conduct these consultations.

The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. The purpose of involving tribes at these early planning stages is to allow consideration of cultural places in the context of broad local land use policy, before individual site-specific, project-level land use decisions are made by a local government.

SB 18 requires local governments to consult with tribes prior to making certain planning decisions and to provide notice to tribes at certain key points in the planning process. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.). Although SB 18 does not specifically mention consultation or notice requirements for adoption or amendment of specific plans, existing state planning law requires local governments to use the same processes for adoption and amendment of specific plans as for general plans (see Government Code §65453). Therefore, where SB 18 requires consultation and/or notice for a general plan adoption or amendment, the requirement extends also to a specific plan adoption or amendment. Although the new law took effect on January 1, 2005, several of its provisions regarding tribal consultation and notice did not take effect until March 1, 2005.

The *General Plan Guidelines* is an advisory document that explains California legal requirements for general plans.[1] The *General Plan Guidelines* closely adheres to statute and case law. It also relies upon commonly accepted principles of contemporary planning practice.

[1] California Government Code §65040.2

When the words "shall" or "must" are used, they represent a statutory or other legal requirement. "May" and "should" are used when there is no such requirement. The 2005 Supplement:

- Provides background information regarding California Native American cultural places and tribes.
- Outlines the basic requirements of SB 18.
- Provides step-by-step guidance to local governments on how and when to consult with tribes.
- Offers advice to help local governments effectively engage in consultation with tribes.
- Provides information about preserving, or mitigating impacts to, cultural places.
- Discusses methods to protect confidentiality of information regarding cultural places.
- Presents ways of encouraging voluntary landowner involvement in the preservation of cultural places.

II. Background Information

The principal objective of SB 18 is to preserve and protect cultural places of California Native Americans. SB 18 is unique in that it requires local governments to involve California Native Americans in early stages of land use planning, extends to both public and private lands, and includes both federally recognized and non-federally recognized tribes. This section provides an overview of California Native American cultural places and California Native Americans.

California Native American Cultural Places

SB 18 refers to Public Resources Code §5097.9 and 5097.995 to define cultural places:[2]

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine (Public Resources Code §5097.9).
- Native American historic, cultural, or sacred site, that is listed or may be eligible for listing in the California Register of Historic Resources pursuant to Section 5024.1, including any historic or prehistoric ruins, any burial ground, any archaeological or historic site (Public Resources Code §5097.995).[3]

These definitions can be inclusive of a variety of places. Archaeological or historic sites may include places of tribal habitation and activity, in addition to burial grounds or cemeteries. Some examples are village sites and sites with evidence (artifacts) of economic, artistic, or other cultural activity. Religious or ceremonial sites and sacred shrines may include places associated with creation stories or other significant spiritual history, as well as modern day places of worship. Collection or gathering sites are specific places where California Native Americans access certain plants for food, medicine, clothing, ceremonial objects, basket making, and other

[2] Due to a drafting error, SB 18 contains multiple references to Public Resources Code (PRC) §5097.995 which is no longer in existence. In 2004, PRC §5097.995 was amended and renumbered to PRC §5097.993 by Senate Bill 1264 (Chapter 286). Local governments should refer to PRC §5097.993 when looking for PRC §5097.995.
[3] *Ibid.*

crafts and uses important to on-going cultural traditions and identities; these places may qualify as religious or ceremonial sites as well as sites that are listed or eligible for listing in the California Register of Historic Resources.

Native American cultural places are located throughout California because California Native American people from hundreds of different tribes made these lands their home for thousands of years. Due to the forced relocation of tribes by the Spanish, Mexicans, and Americans, most tribes do not currently control or occupy the lands on which many of their cultural places are located. As a result, California Native Americans have limited ability to maintain, protect, and access many of their cultural places.

A number of federal and state laws have been enacted to preserve cultural resources and have enabled some Native American tribes to promote the preservation and protection of their cultural places. The National Historic Preservation Act (NHPA), which established historic preservation as a national policy in 1966, includes a Section 106 review process that requires consultation to mitigate damage to "historic properties" (defined per 36 CFR 800.16(1) as places that qualify for the National Register of Historic Places), including Native American traditional cultural places (TCPs, as described in National Register Bulletin 38) whenever any agency directs a project, activity or program using any federal funds or requiring a federal permit, license or approval (36CFR800.16). The National Environmental Policy Act (NEPA) requires every federal project to include in an Environmental Impact Statement documentation of environmental concerns, including effects on important historic, cultural, and natural aspects of our national heritage. Presidential Executive Order 13007, "Indian Sacred Sites," ensures that federal agencies are as responsive as possible to the concerns of Native American tribes regarding their cultural places. The Archaeological Resources Protection Act (ARPA) makes desecration of Native American cultural places on federal lands a felony.

California state law includes a variety of provisions that promote the protection and preservation of Native American cultural places. A number of these provisions address intentional desecration or destruction of cultural places and define certain of such acts as misdemeanors or felonies punishable by both fines and imprisonment. These include the Native American Historic Resource Protection Act (PRC §5097.995-5097.996[4]), Public Resources Code §5097.99, Penal Code §622.5 and Health and Safety Code §7050.5, §7052. Other provisions require consideration of potential impacts of planned projects on cultural resources, which may include Native American cultural places. Public Resources Code 5097.2 requires archaeological surveys to determine the potential impact that any major public works project on state land may have on archaeological resources. The California Environmental Quality Act (CEQA) requires project lead agencies to consider impacts, and potential mitigation of impacts, to unique archaeological and historical resources.[5] California Executive Order W-26-92 affirms that all state agencies shall recognize and, to the extent possible, preserve and maintain the significant heritage resources of the State. Public Resources Code §5097.9, which mandates noninterference of free expression or exercise of Native American religion on public lands, promotes preservation of certain Native American cultural places by ensuring tribal access to these places.

[4] *Ibid.*

[5] CEQA Statutes at Public Resources Code §21083.2-21084.1; CEQA Guidelines at 14 CCR 15064.5-15360.

While these and other laws permit Native Americans to have some say in how impacts to cultural places could be avoided or mitigated, the laws rarely result in Native American input at early stages of land use planning. Generally, these laws provide protection only to those sites located on public or Native American trust lands and address only the concerns of Native Americans who belong to federally recognized tribes, with no official responsibility to non-federally recognized tribes. The intent of SB 18 is to provide all California Native American tribes, as identified by the NAHC, an opportunity to consult with local governments for the purpose of preserving and protecting their cultural places.

California Native American Tribes

SB 18 uses the term, California Native American tribe, and defines this term as "a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the Native American Heritage Commission" (NAHC). "Federal recognition" is a legal distinction that applies to a tribe's rights to a government-to-government relationship with the federal government and eligibility for federal programs. All California Native American tribes, whether officially recognized by the federal government or not, represent distinct and independent governmental entities with specific cultural beliefs and traditions and unique connections to areas of California that are their ancestral homelands. SB 18 recognizes that protection of traditional tribal cultural places is important to all tribes, whether federally recognized or not, and it provides all California Native American tribes with the opportunity to participate in consultation with city and county governments for this purpose. As used in this document, the term "tribe(s)" refers to a California Native American tribe(s).

California has the largest number of tribes and the largest Native American population of any state in the contiguous United States. California is home to 109 federally recognized tribes and several dozen non-federally recognized tribes. According to a 2004 California Department of Finance estimate, the Native American population in California is 383,197.

Tribal governments throughout California vary in organizational forms and size. Some tribes use the government form established under the Indian Reorganization Act of 1934 (25CFR81) with an adopted constitution and bylaws. Other tribes have adopted constitutions and bylaws that incorporate traditional values in governing tribal affairs. Many tribal governments are comprised of a decision making body of elected officials (tribal governing body) with an elected or designated tribal leader. Some tribes use lineal descent as the means of identifying the tribe's leader. In general, tribal governing bodies and leaders serve for limited terms and are elected or designated by members of the tribe. Tribal governments control tribal assets, laws/regulations, membership, and land management decisions that affect the tribe.

III. Basic Requirements of SB 18

This section provides a brief summary of the statutory requirements of SB 18. Later sections of the Supplement provide additional detail regarding these requirements and offer advice to local governments on how to fulfill the notification and consultation requirements of SB 18. (Please refer to Section IV and Section V of these guidelines for additional information regarding the responsibilities outlined below.)

Responsibilities of OPR

Government Code §65040.2(g) requires the Governor's Office of Planning and Research (OPR) to amend the *General Plan Guidelines* to contain advice to local governments on the following:

- Consulting with tribes on the preservation of, or the mitigation of impacts to, cultural places.
- Procedures for identifying through the Native American Heritage Commission (NAHC) the appropriate California Native American tribes with whom to consult.
- Procedures for continuing to protect the confidentiality of information concerning the specific identity, location, character, and use of cultural places.
- Procedures to facilitate voluntary landowner participation to preserve and protect the specific identity, location, character, and use of cultural places.

Responsibilities of Local Governments

SB 18 established responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. The provisions of SB 18 apply only to city and county governments and not to other public agencies. The following list briefly identifies the contact and notification responsibilities of local governments, in sequential order of their occurrence.

- Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment. Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3).[6]
- Prior to the adoption or substantial amendment of a general plan or specific plan, a local government must refer the proposed action to those tribes that are on the NAHC contact list and have traditional lands located within the city or county's jurisdiction. The referral must allow a 45 day comment period (Government Code §65352). Notice must be sent

[6] SB 18 added this new provision to state planning law. It applies to any amendment or adoption of a general plan or specific plan, regardless of the type or nature of the amendment. Adoption or amendment of a local coastal program by a city or county constitutes a general plan amendment.

regardless of whether prior consultation has taken place. Such notice does not initiate a new consultation process.[7]

- Local governments must send notice of a public hearing, at least 10 days prior to the hearing, to tribes who have filed a written request for such notice (Government Code §65092).[8]

Under SB 18, local governments must consult with tribes under two circumstances:

- On or after March 1, 2005, local governments must consult with tribes that have requested consultation in accordance with Government Code §65352.3. The purpose of this consultation is to preserve, or mitigate impacts to, cultural places that may be affected by a general plan or specific plan amendment or adoption.
- On or after March 1, 2005, local governments must consult with tribes before designating open space, if the affected land contains a cultural place and if the affected tribe has requested public notice under Government Code §65092. The purpose of this consultation is to protect the identity of the cultural place and to develop treatment with appropriate dignity of the cultural place in any corresponding management plan (Government Code §65562.5).

Responsibilities of NAHC

The NAHC is charged with the responsibility to maintain a list of California Native American tribes with whom local governments must consult or provide notices (as required in Government Code §65352.3, §65352, and §65092). The criteria for defining "tribe" for the purpose of inclusion on this list are the responsibility of the NAHC. The list of tribes, for the purposes of notice and consultation, is distinct from the Most Likely Descendent (MLD) list that the NAHC maintains.

Upon request, the NAHC will provide local governments with a written contact list of tribes with traditional lands or cultural places located within a city's or county's jurisdiction. These are the tribes that a local government must contact, for purposes of consultation, prior to adoption or amendment of a general plan or specific plan. The NAHC will identify the tribes that must be contacted, based on NAHC's understanding of where traditional lands are located within the State.

For more information on the NAHC's roles and responsibilities, contact the NAHC. (See also Part F: Additional Resources)

[7] Government Code §65352 was amended by SB 18 to include tribes among the entities to whom the proposed action must be referred. The term "substantial amendment" has been in the statute for many years and was not modified by SB 18.

[8] Government Code §65092 was modified by SB 18 to include certain tribes as "persons" that are eligible to request and receive notices of public hearing. "Person" now includes a California Native American tribe that is on the contact list maintained by the NAHC.

Other Elements of SB 18

In addition to the notice and consultation requirements outlined above, SB 18 amended Government Code §65560 to allow the protection of cultural places in the open space element of the general plan. *(See Section X.)* Open space is land designated in the city or county open space element of the general plan for one or more of a variety of potential purposes, including protection of cultural places.

SB 18 also amended Civil Code §815.3 and adds California Native American tribes to the list of entities that can acquire and hold conservation easements. Tribes on the contact list maintained by the NAHC now have the ability to acquire, on terms mutually satisfactory to the tribe and the landowner, conservation easements for the purpose of protecting their cultural places. *(See Section IX.)*

Process Overview: General Plan or Specific Plan Adoption or Amendment

As discussed above, SB 18 establishes responsibilities for local government to contact, refer plans to, and consult with tribes. The following table provides an overview of SB 18 requirements related to the adoption or amendment of a general plan or specific plan. All statutory references are to the Government Code (GC).

Overview of SB 18 Consultation and Notice Requirements

Step	***OPR Guidelines (GDL) Section and Statutory Reference***
Adoption or amendment of any general plan (GP) or specific plan (SP) is proposed on or after March 1, 2005.	GDL Section IV GC §65352.3(a)(1)
Local government sends proposal information to NAHC and requests contact information for tribes with traditional lands or places located within the geographical areas affected by the proposed changes.	GDL Section IV GC §65352.3(a)(2)
NAHC provides tribal contact information. – OPR recommends that NAHC provide written information as soon as possible but no later than 30 days after receiving a local government's request	GDL Section IV
Local government contacts tribe(s) identified by NAHC and notifies them of the opportunity to consult. – Pursuant to Government Code §65352.3, local government must consult with tribes on the NAHC contact list.	GDL Section IV
Tribe(s) responds to a local government notice within 90 days, indicating whether or not they want to consult with the local government. – Consultation does not begin until/unless a tribe requests it within 90 days of receiving a notice of the opportunity to consult. – Tribes can agree to a shorter timeframe (less than 90 days) to request consultation.	GDL Section IV GC §65352.3(a)(2)

Step	***OPR Guidelines (GDL) Section and Statutory Reference***
Consultation begins, if requested by tribe. No statutory limit on the duration of the consultation. – Consultation may continue through planning commission or board of supervisors/city council deliberation on plan proposal.	GDL Section IV
Local government continues normal processing of GP/SP adoption or amendment. (CEQA review, preparation of staff reports, consultation, etc., may be ongoing.)	
At least 45 days before local government adopts or substantially amends GP/SP, local government refers proposed action to agencies, including tribe(s). – Referral required regardless of whether or not there has been prior consultation. – This does not initiate a new consultation process. – This opens 45 day comment period before approval by board of supervisors/city council. – Referral required on or after March 1, 2005.	GDL Section III GC §65352(a)(8)
At least 10 days before public hearing, local government provides notice of hearing to tribes and any other persons who have requested such notice.	GDL Section III GC §65092
Public hearing of board of supervisors/city council to take final action on the GP/SP.	

Note: The Permit Streamlining Act (PSA) (GC §65920 et seq.) establishes time limits for public agencies to take action on privately initiated development projects. Some general plan amendments may involve a private applicant for a development project. The PSA does not apply to a project that requires approval by a legislative act, such as a general plan amendment or rezone, even if there is a quasi-judicial approval involved (such as a use permit or subdivision map). Therefore, time limits for project approval under the PSA should not interfere with a local government's process for consultation.

Part B
When and How to Consult with California Native American Tribes

Sections IV and V of the 2005 Supplement provide step-by-step guidance to local government agencies on how and when to consult with tribes, including when to provide certain types of notices during the planning process. It is very important to review the information in Part C (Pre-Consultation) before undertaking consultation on a general plan or specific plan proposal.

IV. Consultation: General Plan and Specific Plan Adoption or Amendment

Each time a local government considers a proposal to adopt or amend the general plan or specific plan, they are required to contact the appropriate tribes identified by the NAHC. If requested by tribes, local governments must consult for the purpose of preserving or mitigating impacts to cultural places. The following section provides basic guidance to local governments on the notification and consultation requirements in Government Code §65352.3.

What Triggers Consultation?

Government Code §65352.3 requires local governments to consult with tribes prior to the adoption or amendment of a general plan or specific plan proposed on or after March 1, 2005. Local governments should consider the following when determining whether a general plan or specific plan adoption or amendment is subject to notice and consultation requirements:

- In the case of an applicant-initiated plan proposal, if the local government accepts a complete application (as defined in Government Code §65943) on or after March 1, 2005, the proposal is subject to Government Code §65352.3.
- In the case of a general plan or specific plan amendment initiated by the local government, any proposal introduced for study in a public forum on or after March 1, 2005 is subject to Government Code §65352.3. A legislative body must take certain actions to initiate, or propose, a general plan or general plan amendment. These actions must be taken in a duly noticed public meeting, and may include, but are not limited to, any of the following: appropriation of funds, adoption of a work program, engaging the services of a consultant, or directing the planning staff to begin research on the activity.

Under Government Code §65352.3, only if a tribe is identified by the NAHC, and that tribe requests consultation after being contacted by a local government, must a local government consult with the tribe on the plan proposal.

Local governments are encouraged to consult with tribes as early as possible and may, if appropriate, begin consultation even before a formal proposal is submitted by an applicant or initiated by the local government.

Identifying Tribes through the NAHC

Once a local government or private applicant initiates a proposal to adopt or amend a general plan or specific plan, the local government must send a written request to the NAHC asking for a list of tribes with whom to consult. OPR recommends that the written request be sent to the NAHC as soon as possible. Local governments should consider the following points when submitting a request to the NAHC:

- All written requests should be sent to the NAHC via certified mail or by fax.
- Requests to the NAHC should include the specific location of the area that is subject to the proposed action, preferably with a map clearly showing the area of land involved.
- Requests should clearly state that the local government is seeking information about tribes that are on the "SB 18 Consultation List."
- Contact information for the NAHC:

  Native American Heritage Commission
  915 Capitol Mall, Room 364
  Sacramento, CA 95814
  Phone: 916-653-4082
  Fax: 916-657-5390
  http://www.nahc.ca.gov

A sample form for submitting a request to the NAHC is provided in Exhibit A. The tribal consultation list request form is also available on the NAHC website.

The NAHC will provide local governments with a written contact list of tribes with traditional lands or cultural places located within the local government's jurisdiction. For each listed tribe, the NAHC will provide the tribal representative's name, name of tribe, address, and phone number (if available, fax and email address). Although there is no statutory deadline for NAHC to respond to the local government, OPR recommends that the NAHC provide written contact information as soon as possible but no later than 30 days after receiving a written request from the local government.

Contacting Tribes Pursuant to Government Code §65352.3

Once a tribal contact list is received from the NAHC, local governments must contact the appropriate tribe(s) and invite them to participate in consultation. OPR suggests that local governments contact tribes as soon as possible upon receiving the tribal contact list. While the statute does not specify by what means tribe(s) should be contacted, OPR suggests that local governments send a written notice by certified mail with return receipt requested. Sending a written notice does not preclude a local government from also contacting the tribe by telephone, FAX, or e-mail.

Notices should be concise, clear, and informative so that tribes understand what they are receiving. Try to avoid using a standard public notice format to invite a tribe to consult, as most public notices do not contain sufficient information about the proposed action to enable a tribe to

respond. Keep in mind that the purpose of this notice is to invite a tribe to request consultation. Notices sent from a local government to a tribe, inquiring whether consultation is desired, should contain the following information:

- A clear statement of purpose, inviting the tribe to consult and declaring the importance of the tribe's participation in the local planning process.
- A description of the proposed general plan or specific plan being considered, the reason for the proposal, and the specific geographic area(s) that will be affected by the proposal. Relevant technical documents should be provided with a concise explanation that clearly describes the proposed general plan or specific plan amendment and its potential impacts on cultural resources, if known.
- Maps that clearly detail the geographic areas described in the explanation. Maps should be in a reasonable scale with sufficient references for easy identification of the affected areas.
- The deadline (date) by which the tribe must request a consultation with the local government. By law, tribes have 90 days from the date of receipt of the notice to request consultation (Government Code §65352.3(a)(2)).
- Contact information for representatives of the local government to whom the tribe should respond.
- Contact information for the project proponent/applicant and landowner(s), if applicable.
- Technical reports, including summaries of cultural resource reports and archaeological reports applicable to that tribe's cultural place(s), if available.
- Information on proposed grading or other ground-disturbing activities, if applicable. (This may be included in the project description.)

Subject to confidentiality procedures, both parties should maintain clear records of communications, including letters, telephone calls, and faxes. Both parties may send notices by certified mail and keep logs of telephone calls and faxes. Any returned or unanswered correspondence should be retained in order to verify efforts to communicate. Documentation of notification and consultation requests should be included in the local government's public record.

In addition to the above recommendations, local governments may, in cooperation with tribes, develop notification procedures as a part of consultation protocols established in cooperation with a tribal government. Local governments should be aware that some tribes already have consultation protocols. In addition, local governments may adopt policies regarding consultation with a tribal government. *(See Section VI.)*

After Notification is Sent to the Tribe

Once local governments have sent notification, tribes are responsible for requesting consultation. Pursuant to Government Code §65352.3(a)(2), each tribe has 90 days from the date on which they receive notification to respond and request consultation. Some key points to consider include:

- The time period for consultation (undefined) is independent of the time period for tribes to request consultation (90 days).
- Local governments should be aware that tribes may require the entire 90-day period allowed by law to respond to a consultation request. Tribal governing bodies may need to meet to take a formal position on consultation.
- Local governments and tribal governments may consider addressing the method and timing of a tribe's response to a consultation request in a jointly-developed consultation protocol. *(See Section VI.)*
- At their discretion, tribes can agree to a shorter timeframe (less than 90 days) to respond and request consultation.
- After the information about a proposed plan or plan amendment is received by the tribe, local governments should cooperate to provide any additional pertinent information about the proposed plan or plan amendment that the tribe may request. Local governments may consider extending the 90 day timeframe for the tribe to review the new information and respond accordingly.
- If the tribe does not respond within 90 days or declines consultation, consultation is not required under Government Code §65352.3.

Conducting Consultation on General Plan or Specific Plan Adoption or Amendment

Once a tribe requests consultation, consultation for the purpose of preserving or mitigating impacts to cultural places should begin within a reasonable time. Consultation should focus on how the proposed general plan or specific plan amendment or adoption might impact cultural places located on land affected by the plan proposal. The objectives of consultation, according to the legislative intent of SB 18, include:

- Recognizing that cultural places are essential elements in tribal culture, traditions, heritages and identities.
- Establishing meaningful dialogue between local and tribal governments in order to identify cultural places and consider cultural places in local land use planning.
- Avoiding potential conflicts over the preservation of Native American cultural places by ensuring local and tribal governments have information available early in the land use planning process.
- Encouraging the preservation and protection of Native American cultural places in the land use process by placing them in open space.
- Developing proper treatment and management plans in order to preserve cultural places.
- Enabling tribes to manage and act as caretakers of their cultural places.

Consultation is a process in which both the tribe and local government invest time and effort into seeking a mutually agreeable resolution for the purpose of preserving or mitigating impacts to a cultural place, where feasible. Government Code §65352.4 provides a definition of consultation for use by local governments and tribes:

> *Consultation means the meaningful and timely process of seeking, discussing, and considering carefully the views of others, in a manner that is cognizant of all parties' cultural values and, where feasible, seeking agreement. Consultation between government agencies and Native American tribes shall be conducted in a way that is mutually respectful of each party's sovereignty. Consultation shall also recognize the tribes' potential needs for confidentiality with respect to places that have traditional tribal cultural significance.*

Effective consultation is an ongoing process, not a single event. The process should focus on identifying issues of concern to tribes pertinent to the cultural place(s) at issue – including cultural values, religious beliefs, traditional practices, and laws protecting California Native American cultural sites – and on defining the full range of acceptable ways in which a local government can accommodate tribal concerns.

Items to Consider When Conducting Consultation

The following list identifies recommendations for how local governments and tribes may approach consultation on general plan and specific plan proposals.

- As defined in Government Code §65352.4, consultation is to be conducted between two parties: the local government and the tribe. Both parties to the consultation are required to carefully consider the views of the other.
- Consultation does not necessarily predetermine the outcome of the plan or amendment. In some instances, local governments may be unable to reach agreement due to other state laws or competing public policy objectives.
- Local governments must consult with each tribe who is identified by the NAHC and requests consultation. The NAHC will identify whether there are, in fact, any tribes with whom the local government must consult. One or more tribes may have traditional cultural ties to land within the local government's jurisdiction and have an interest in preserving cultural places on those lands. Therefore, local governments may have to consult with more than one tribe on any particular plan proposal.
- OPR recommends that local governments consult with tribes one at a time (individually). If multiple tribes are involved and willing to jointly consult, local governments may consult with more than one tribe at a time.
- When a local government first contacts a tribe, its initial inquiry should be made to the tribal representative identified by the NAHC. OPR recommends that a local government department head or other official of similar or higher rank make the initial contact.
- Government leaders of the two consulting parties may consider delegating consultation responsibilities (such as attending meetings, sharing information, and negotiating the needs and concerns of both parties) to staff. Designated representatives should maintain direct relationships with and have ready access to their respective government leaders. These individuals may, but are not required to, be identified in a jointly-developed consultation protocol. *(See Section VI.)* In addition, the services of other professionals (attorneys,

contractors, or consultants) may be utilized to develop legal, factual, or technical information necessary to facilitate consultation.

- Simply notifying a tribe of a plan proposal is not the same as consultation.[9]
- Local governments should be aware of the potential for vast differences in tribal governments' level of staffing and other resources necessary to participate in the manner required by Government Code §65352.3 and §65352.4. Some may be able to respond more promptly and efficiently than others. Local governments should keep this in mind if and when developing a consultation protocol with a tribe. *(See Section VI.)*
- As a part of consultation, local governments may conduct record searches through the NAHC and California Historic Resources Information System (CHRIS) to determine if any cultural places are located within the area(s) affected by the proposed action. Local governments should be aware, however, that records maintained by the NAHC and CHRIS are not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a cultural place.
- Local governments should be aware that the confidentiality of cultural places is critical to tribal culture and that many tribes may seek confidentiality assurances prior to divulging information about those sites. *(See Section VIII.)*
- Tribal consultation should be done face-to-face. If acceptable to both parties, local and tribal governments may wish to define circumstances under which parts of the consultation process can be carried out via conference calls, e-mails, or letters. *(See Section VIII.)*
- Tribal consultations should be conducted in a setting that promotes confidential treatment of any sensitive information that is shared about cultural places. Consultation should not take place in public meetings or public hearings.
- The time and location of consultation meetings should be flexible to accommodate the needs of both the local government and tribe. Local governments should recognize that travel required for in-person consultation may be time-consuming, due to the rural location of a tribe. Local governments should also take into account time zone changes when setting meeting times. Local governments should offer a meeting location at the city hall, county administrative building, or other appropriate location. Local governments should also be open to a tribe's invitation to meet at tribal facilities.
- The local government and tribe can agree to mutually invite private landowners to participate in consultation, if both parties feel that landowner involvement would be appropriate.
- Local governments are encouraged to establish a collaborative relationship with tribes as early as possible, prior to the need to consult on a particular general plan or specific plan

[9] In *Pueblo of Sandia v. United States*, 50 F.3d 856 (10th Cir. 1995), the court held that the U.S. Forest Service had not fulfilled its consultation responsibilities under the National Historic Preservation Act by merely sending letters to request information from tribes. The court ruling held that written correspondence requesting consultation with a tribe was not sufficient for the purpose of conducting consultation as required by law, and that telephone calls or more direct forms of contact may be required.

amendment or adoption. Local governments may consider conducting pre-consultation meetings and developing consultation protocols in cooperation with tribes. *(See Section VI.)*

- Both parties should attempt to document the progress of consultation, including letters, telephone calls, and direct meetings, without disclosing sensitive information about a cultural place. Local governments may also want to document how the local government representative(s) fulfilled their obligations under Government Code §65352.3 and §65352.4.

When is Consultation Over?

Alan Downer, of the Advisory Council on Historic Preservation, described consultation as "conferring between two or more parties to identify issues and make a good faith attempt to find a mutually acceptable resolution of any differences identified."[10] Differences of opinion and of priorities will arise in consultation between local and tribal governments. Whenever feasible, both local and tribal governments should strive to find mutually acceptable resolutions to differences identified through consultation.

When engaging in consultation, local government and tribal representatives should consider leaving the process open-ended to allow every opportunity for mutual agreement to be reached. Some consultations may involve highly sensitive and complex issues that cannot be resolved in just one discussion. Consultation may require a series of meetings before a mutually acceptable agreement may be achieved. Consultation must be concluded prior to the formal adoption or amendment of a general plan or specific plan.

Consultation, pursuant to Government Code §65352.3 and §65352.4, should be considered concluded at the point in which:

- the parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
- either the local government or tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning appropriate measures of preservation or mitigation.

V. Consultation: Cultural Places Located in Open Space

On and after March 1, 2005, if land designated, or proposed to be designated as open space contains a cultural place, and if an affected tribe has requested notice of public hearing under Government Code §65092, then local governments must consult with the tribe. The purpose of this consultation is to determine the level of confidentiality required to protect the specific identity, location, or use of the cultural place, and to develop treatment with appropriate dignity of the cultural place in any corresponding management plan (Government Code §65562.5). This consultation provision does not apply to lands that were designated as open space before March 1, 2005.

[10] From "The Navajo Nation Model: Tribal Consultation Under the National Historic Preservation Act" (2000).

What Triggers Consultation?

Government Code §65562.5 applies to land that is designated, or proposed to be designated, as open space, on or after March 1, 2005. Local governments must consider several criteria when determining whether consultation is required, prior to designating open space on or after March 1, 2005.

Local governments must first learn whether the land designated, or proposed to be designated, as open space contains a cultural place. The following are methods by which local governments may be informed if a cultural place is located on designated or proposed open space:

- Conduct a record search through the NAHC to learn whether any listed cultural places are located on land proposed to be designated as open space. The local government should provide maps of lands proposed as open space to the NAHC with a request to identify whether there are any cultural places on the property. Because the NAHC's sacred lands file is confidential, the commission will only divulge the presence or absence of a listed site and will direct the local government to the appropriate tribe(s) for more information.
- Conduct a record search through CHRIS to learn whether any listed cultural places are located on land proposed to be designated as open space. Local governments should enter into agreements with CHRIS information centers to establish procedures and protocols for requesting searches of historical resource records.
- Request that tribes identify the existence of any cultural places on the proposed open space land. Local governments should send a written request to the NAHC asking for a written list of tribes that have traditional cultural ties to the proposed open space. The NAHC will provide tribal contact information. Local governments should contact each tribe on the list provided by the NAHC to learn whether any cultural places are located on the land proposed as open space. Local government should provide the tribe with a sufficiently detailed map of the open space together with a concise notice as to why the tribe is being contacted. (Note: This contact is strictly for the purpose of identifying whether a cultural place is or may be located on the proposed open space land. It does not start consultation with a tribe.)

Local governments should be aware that records maintained by the NAHC and CHRIS are not exhaustive, and a negative response to searches does not preclude the existence of a cultural place. In most instances, and especially because of associated confidentiality issues, it is likely that tribes will be the only source of information regarding certain cultural places.

After a local government learns that a cultural place is or may be located on land designated or proposed to be designated as open space, the local government must notify the appropriate tribes of the opportunity to participate in consultation. The appropriate tribes are those which have: (1) been identified by the NAHC, and (2) requested notice of public hearing from the local government pursuant to Government Code §65092.

Conducting Consultation Regarding Open Space

The purpose of this consultation is to determine the level of confidentiality required to protect the specific identity, location, character, or use of the cultural place and to develop treatment with appropriate dignity of the cultural place in any corresponding open space management plan. The reference to "any corresponding management plan" is not meant to imply that there is such a plan or that the local government must develop such a management plan. This language is intended to encourage consideration of management policies and practices which may be discussed between the local government and tribe and incorporated into a new or existing management plan for the cultural place.

The following are examples of appropriate items to consider and discuss during consultation:

- Encourage tribal involvement in the treatment and management of the cultural place though contracting, monitoring, co-management, and other forms of joint local-tribal participation.
- Tribes may only wish to disclose a sufficient amount of information to protect the site and to allow for the proper treatment and management of the cultural place. *(See Section VIII.)*
- Tribes may wish to have access to cultural places located on open space for gathering, performing ceremonies and/or helping maintain the site.
- Tribes may want to recommend management practices that avoid disturbing or impacting the cultural place.
- Tribes may wish to discourage certain land uses (e.g. recreation) within the open space that could adversely impact the cultural place. Local governments may be asked to consider appropriate land uses in the open space designation that would avoid direct impacts to the cultural place.

The designation of open space, as provided in Government Code §65562.5, may but does not always, involve amending the general plan. In some jurisdictions, designation of open space may occur through rezoning of land from one zone designation to an open space zone designation, without the need for a general plan amendment. However, for proposals to designate open space that require a general plan or specific amendment, the local government should consider the above recommendations as well as the recommendations outlined in Section IV of these guidelines.

When is Consultation Over?

Please refer to Section IV for additional information regarding the meaning of consultation.

Part C
Pre-Consultation

Section VI provides advice to local governments that is intended to help them more effectively engage in consultation with tribes. This part of the 2005 Supplement provides information that may help local governments establish working relationships with tribes prior to entering into the required consultation pursuant to Government Code §65352.3 and §65562.5.

VI. Preparing for Consultation

As discussed above, Government Code §65352.3 requires consultation during the process of amending or adopting general plans or specific plans. In addition, Government Code §65562.5 requires consultation to determine the proper level of confidentiality to protect and treat a cultural place with appropriate dignity, where such places are located on lands to be designated as open space. Before engaging in consultation in either of these cases, local governments may want to consider developing relationships with tribes that have traditional lands within their jurisdiction. Although not required by law, these pre-consultation efforts may develop a foundation for a mutually respectful and cooperative relationship that helps to ensure more smooth and effective communication in future consultations.

Local governments way wish to consider the following when undertaking pre-consultation meetings:

- Contact the NAHC to obtain a list of all appropriate tribes with whom to pre-consult. Because this list may be revised over time by the NAHC, local governments should periodically request updated contact lists.
- Contact the NAHC and CHRIS to learn if any historical or cultural places are located within the city's or county's jurisdiction. (Note that the NAHC and CHRIS have different procedures for searching information about cultural sites. See Part F for more information about each organization and how to contact them. As previously noted, NAHC and CHRIS records pertaining to cultural places are not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place.)
- Invite each tribal government's leaders to meet with local government leaders for the purpose of establishing working relationships and exchanging information about respective governmental structures, practices, and processes. Pre-consultation meetings may include discussion about community goals, planning priorities, and how cultural places play a role in the tribal culture.
- Hold informational workshops or meetings with the tribe(s) to discuss the general plan process, the existing general plan, and any contemplated amendments. Local governments should not expect or ask a tribe to share confidential information in a meeting with other tribes or the general public.
- Ask tribes whether they have existing consultation protocols.

- Develop a consultation protocol that addresses how a cooperative relationship can be maintained and how future consultations should be conducted. Some tribes may already have established protocols through working with other agencies, such as state and federal entities, that can be used as models.

If a tribe and local government decide to develop a consultation protocol, both parties should suggest topics that they believe will facilitate consultation. The following are examples of items that may be appropriate to discuss and include in a jointly-developed consultation protocol:

- Representative(s) from each consulting party who will be designated to participate in consultations and manage the information resulting from the consultations.
- Key points in the consultation process when elected government leaders may need to be directly involved in consultation.
- Method(s) of contact preferred by the tribal government and additional tribal representatives that the local government should contact regarding a proposed action.
- Procedures for giving and receiving notice, including method and timing.
- Preferred method(s) of consultation. While in-person consultation is recommended, it may be acceptable to both parties that certain aspects of consultation occur through conference calls, e-mails, or letters.
- Preferred locations of consultation meetings.
- The tribe's willingness to participate in joint consultation, should a specific site be of interest to more than one tribe.
- Procedures to allow tribal access to the local government's consultation records.
- Procedures for maintaining accurate, up-to-date contact information.

Over time, the initial approach to consultation may need to be updated. Both parties should be open to identifying and agreeing on changes to their consultation protocol.

Part D
Preservation, Mitigation, Confidentiality, and Landowner Participation

Sections VII through IX provide advice to local governments for considering issues such as appropriate means to preserve, or mitigate impacts to, cultural places; methods to protect the confidentiality of cultural places; and ways to encourage the participation of landowners in voluntary preservation efforts.

VII. Preservation of, or Mitigation of Impacts to, Cultural Places

Government Code §65352.3 requires local governments to conduct consultations with tribes (when requested) for the purpose of "preserving or mitigating impacts" to California Native American cultural places. In the course of adopting or amending a general plan or specific plan, local governments may be informed of the existence of a cultural place within the affected area. Should a tribe request consultation to discuss any impacts to the cultural place, local governments should consider a variety of factors when participating in the consultations, including: the history and importance of the cultural place, the adverse impact the local government action may have on the cultural place, options for preserving the cultural place, and options for mitigating impacts of the proposal to the cultural place.

When participating in consultations, it is important that local governments consider that, because of philosophical differences, mitigation will not always be viewed as an appropriate option to protect cultural, and often irreplaceable, places. Many tribes may determine that impacts to a cultural place cannot be mitigated; that the only appropriate treatment may be to preserve the cultural place without impact to its physical or spiritual integrity. Of course, this is not to say that tribes will not engage in discussions regarding mitigation of impacts to their cultural places, but local governments should consider the vastly different perspectives that tribes may have. What a local government may consider to be acceptable treatment under current environmental, land use, and cultural resource protection laws, may not be considered by a tribe to be acceptable treatment for a sacred or religious place.

The following is a discussion of preservation and mitigation, as mentioned in Government Code §65352.3. Local governments should check with their legal counsels to identify any other legal obligations to preserve or mitigate impacts to Native American cultural resources.

What are Preservation and Mitigation?

Preservation is the conscious act of avoiding or protecting a cultural place from adverse impacts including loss or harm. Mitigation, on the other hand, is the act of moderating the adverse impacts that general plan or specific plan adoption or amendment may have on a cultural place.

While local governments should strive to help preserve the integrity of, access to, and use of cultural places[11], mitigation may often be achieved through a broad range of measures:

- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the impacted cultural place.
- Reducing or eliminating the impact over time through monitoring and management of the cultural place.

Other methods of mitigation may include:

- Designation of open space land in accordance with Government Code §65560(b).
- Enhancement of habitat or open space properties for protection of cultural place.
- Development of an alternate site suitable for tribal purposes and acceptable to the tribe.
- Other alternative means of preserving California Native American cultural features, where feasible.

It is important that local governments consider that mitigation measures may largely differ depending on customs of a particular tribe, the characteristics and uses of a site or object, the cultural place's location, and the importance of the site to the tribe's cultural heritage. Where a cultural place is affected by a proposed general or specific plan adoption or amendment, consultations with tribes should focus on preserving, or mitigating the impacts to, that specific cultural place.

Seeking Agreement Where Feasible

Although Government Code §65352.3(a) requires consultation for the purpose of preserving or mitigating against the adverse impacts that a general plan or specific plan adoption or amendment may have on a cultural place, there is no requirement to preserve a cultural place or adopt mitigation measures, if agreement cannot be reached. Under the definition of "consultation" within Government Code §65352.4, local governments and tribes are required to carefully consider each other's views and are required to seek an agreement, "where feasible." For the purposes of Government Code §65352.4, agreements should be considered "feasible" when capable of being accomplished in a successful manner within a reasonable time taking into account economic, environmental, social and technological factors.[12] If, after conducting consultations in good faith and within the spirit of the definition, the tribe or local government cannot reach agreement on preservation or mitigation of any impact to a California Native American cultural place, neither party is required to take any action under Government Code §65352.3(a).

[11] Cultural Places referring to places, features, and objects under Government Code §65352.3(a) and described in Government Code §§5097.9 and 5097.995.
[12] See *State of California General Plan Guidelines*, Governor's Office of Planning & Research, Glossary, page 261.

Monitoring and Management

During consultations, local governments should consider the involvement of tribes in the ongoing treatment and management of cultural places, objects, or cultural features through a specific monitoring program, co-management, or other forms of participation.

Where a cemetery, burial ground, or village site may be present, the planning of treatment and management activities should address the possibility that California Native American human remains may be involved when protecting cultural features. Local governments should consider working with tribes to develop an appropriate plan for the identification and treatment of such discoveries in accordance with Public Resources Code §5097.98.

Private Landowner Involvement

During consideration of a proposed general plan adoption or amendment, a local government may discover or be informed of a cultural place that exists on privately owned land within an affected area. In such an instance, local governments should first contact the appropriate tribe or tribes to offer consultations and determine an acceptable level of landowner involvement. Local governments should be aware that there may be some occasions where a tribe may prefer to maintain strict confidentiality without the inclusion of a private, third party landowner.

If a tribe is interested in involving the landowner in preservation or mitigation activities, the local government should consider facilitating such involvement. It is important that local governments and tribes understand that there is no statutory requirement to include private landowners under the government-to-government consultations requirements of Government Code §65352.3(a). However, because landowner participation is encouraged, local governments may consider suggesting the following methods to facilitate landowner involvement:

- Suggesting that the tribe contact the private landowner directly to facilitate discussions between the tribe and landowner.
- Offering to contact the private landowner directly on behalf of the tribe.
- Suggesting that the private landowner be included as a party to the consultations.

VIII. Confidentiality of Information

Protecting the confidentiality of California Native American prehistoric, archaeological, cultural, spiritual, and ceremonial places is one of the most important objectives of SB 18. This is clearly evidenced by SB 18's legislative intent as well as its statutory additions and amendments which address the issue of confidentiality and requires "each city and county to protect the confidentiality of information concerning" cultural places.[13] By maintaining the confidentiality of a cultural place, including its location, traditional uses, and characteristics, local governments can help assure tribes of continued access and use of these cultural places, in addition to aiding in the preservation of a cultural place's integrity. However, local governments should take into consideration other state and federal laws which may impose conflicting public policy priorities or requirements.

[13] See SB 18 §1(b)(3), (Burton, Ch. 905, Stat. 2004); Govt. Code §§ 65040.2(g)(3), 65352.3, 65352.4, and 65562.5.

Public Disclosure Laws

The California Public Records Act (Government Code §6250 et. seq.) and California's open meeting laws applying to local governments (The Brown Act, Government Code §54950 et. seq.) both have implications with regard to maintaining confidentiality of California Native American cultural place information. Local governments are encouraged to carefully consider these laws in greater detail, and adopt or incorporate these recommendations into their own confidentiality procedures in order to avoid the unintended disclosure of confidential cultural place information.

The California Public Records Act (CPRA)

Subject to specified exemptions, the CPRA provides that all written records maintained by local or state government are public documents and are to be made available to the public, upon request. Written records include all forms of recorded information (including electronic) that currently exist or that may exist in the future. The CPRA requires government agencies to make records promptly available to any citizen who asks, unless an exemption applies.

The CPRA contains two exemptions which aid in the protection of records relating to Native American cultural places. Amended in October of 2005 for broad application, these exemptions now permit any state or local agency to deny a CPRA request and withhold from public disclosure:

1) "records of Native American graves, cemeteries, and sacred places and records of Native American places, features, and objects described in Section 5097.9 and 5097.993 of the Public Resources Code maintained by, or in the possession of, the Native American Heritage Commission, another state agency, or a local agency" (GC § 6254(r)); and
2) "records that relate to archaeological site information and reports maintained by, or in the possession of, the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, another state agency, or a local agency, including the records that the agency obtains through a consultation process between a California Native American tribe and a state or local agency" (GC § 6254.10).

With these two CPRA exemptions in place, information related to Native American cultural places is specifically protected from mandatory public disclosure. Such protections are intended to facilitate the free exchange of information between Native American tribes and California local governments when conducting tribal consultations. Even with this protection, however, it is important for local governments to understand that some tribes may withhold information during consultations due to conflicts with their cultural beliefs and practices. Local governments and Native American tribes should discuss such issues early in consultations, or during pre-consultation, so that each has an understanding of what information can and cannot be divulged. Additionally, it is important for all parties to recognize that a legislative body of a city or county must have access to certain information in order to make an informed decision regarding the given plan adoption or amendment.

The Brown Act

The Brown Act governs the legislative bodies of all local agencies within California. It requires that meetings held by these bodies be "open and public." Under this Act, no local legislative body may take an action in secret, nor will the body's action be upheld if it is in violation of California's open meeting laws. The Brown Act defines a "meeting" as a gathering of a majority of the members of a applicable body to hear, discuss, or deliberate on matters within the agency's or board's jurisdiction.

While the Brown Act does contain some exceptions for "closed meetings," none of these exceptions would allow the quorum of a local legislative body to participate in tribal consultations within a closed meeting. Should a local legislative body participate in confidential tribal consultations, it is important that they do so as an advisory committee with *less than* a quorum, so as to not invoke the Brown Act's requirements of public participation (see Government Code §54952(b)). Otherwise, the Brown Act will require that the consultations be held in public, thereby defeating the purpose of confidentiality, or, alternatively, any decisions made by the quorum of the body within a closed meeting would be rendered invalid.

In order to efficiently conduct tribal consultation meetings, in addition to maintaining confidentiality at all times, local governments are encouraged to develop procedures in advance that would designate a committee or agency in charge. In doing so, local governments should consider the problems associated with elected official participation within tribal consultations, and should tailor their procedures accordingly.

Public Hearings

General plan amendments, specific plan amendments, and the adoption of a general or specific plan each require both a planning commission and a city council or board of supervisors to conduct public hearings. The decision to approve or deny these proposals must be based in reason and upon evidence in the record of the public hearing. When addressing an adoption or amendment involving a cultural place, elected officials will need to be apprised of the cultural site implications in order to make informed decision. However, to maintain the confidentiality of this cultural place information, local governments and tribes, during consultations, should agree on what non-specific information may be disclosed during the course of a public hearing. Additionally, local governments should avoid including any specific cultural place information within CEQA documents (such as Environmental Impact Reports, Negative Declaration, and Mitigated Negative Declarations) or staff reports which are required to be available at a public hearing. In such cases, confidential cultural resource inventories or reports generated for environmental documents should be maintained under separate cover and shall not be available to the public.

Additional Confidentiality Procedures

Additionally, local governments should consider the following items when considering steps to be taken in order to maintain confidentiality:

- Local governments should develop "in-house" confidentiality procedures.

- Procedures should be established to allow for tribes to share information with local government officials in a confidential setting.
- Only those tribal designees, planning officials, qualified professional archaeologists, and landowners involved in the particular planning activity should obtain information about a specific site.
- Participating landowners should be asked to sign a non-disclosure agreement with the appropriate tribe prior to gaining access to any specific site information.
- Local governments should not include detailed (confidential) information about cultural places in any of its public documents.
- Possible procedures to require local government to notify participating tribes and landowners whenever records containing specific site information have been requested for public disclosure.

Local governments should also keep in mind that the terms for confidentiality may differ depending upon the nature of the site, the tribe, the local government, the landowner, or who proposes to protect the site. Local governments should collaborate with tribes to develop informational materials to educate landowners regarding the cultural sensitivity of divulging site information, explaining the tribe's interest in maintaining the confidentiality and preservation of a site. Landowners should be informed of criminal penalties within the law for the unlawful and intentional destruction, degradation or removal of California Native American cultural or spiritual places located on public or private lands (Public Resources Code §5097.995).[14]

Confidentiality Procedures for Private Landowner Involvement

In order to successfully preserve or mitigate impacts to a California Native American cultural place, local governments and tribes may find it necessary or advantageous to involve private landowners early in the consultation process. Often, landowners may not be aware that a cultural place exists on their property, or alternatively, may not realize that the site has become subject to a general plan adoption or amendment. Due to the confidential nature of certain information involved, local governments should consider working with tribes to adopt procedures that would balance the value of landowner involvement with the need for cultural place confidentiality. Local governments and California Native American tribes may wish to consider the following procedures that would inform and potentially involve landowners in the consultation process, without compromising the confidentiality of a cultural place:

- Local governments, at the request of a tribe, may consider contacting a landowner directly and, without disclosing the exact location or characteristics of the site, inform the landowner of the existence of a culturally significant place on their property. A local government may consider inquiring as to whether the landowner would be willing to further discuss the matter directly with the appropriate tribal representative under a non-disclosure agreement.

[14] Due to a drafting error, SB 18 contains multiple references to Public Resources Code (PRC) §5097.995 which is no longer in existence. In 2004, PRC §5097.995 was amended and renumbered to PRC §5097.993 by Senate Bill 1264 (Chapter 286). Local governments should refer to PRC §5097.993 when looking for PRC §5097.995.

- Local governments may consider giving the landowner's contact information to a tribe so that the tribe may contact the landowner directly. Discussion about conservation easements is an example of a case in which a tribe and landowner may wish to meet without the direct participation of the local government.
- Local governments may also consider informing a landowner of the ability of landowners to access CHRIS for cultural resource information specific to their land. Local governments should keep in mind that the CHRIS system does not contain a catalog of every cultural place within California.

IX. Procedures to Facilitate Voluntary Landowner Protection Efforts

In addition to their own consultation with tribes, local governments may help facilitate landowner participation in preserving and protecting cultural places. While each city and county should develop its own policies on landowner participation, general strategies for encouraging landowner awareness of and participation in cultural place protection may include:

- Collaborating with local tribes to offer cultural awareness and other educational events for landowners.
- Encouraging landowner participation in discussions about appropriate preservation and mitigation measures.
- Promoting the use of conservation easements and other private conservation efforts.

It should be noted that SB 18 does not require landowners to dedicate or sell conservation easements for the purpose of cultural place preservation. Neither are local governments required to play a direct role in any private conservation activity. Government Code §65040.2(g), however, does require OPR to recommend procedures to facilitate voluntary landowner participation in the preservation and protection of cultural places.

Landowner Education and Participation

Public workshops, seminars, and other educational sessions may provide forums for tribal representatives to share tribal and cultural information and discuss general protection concerns with landowners. These sessions may build cultural awareness, develop landowner understanding of the importance of cultural places, and also encourage further dialogue between tribes and landowners. These sessions should generally inform landowners of the importance of cultural places and should not compromise the confidentiality of a specific cultural place.

Local governments may also encourage landowner participation in discussions about preserving or mitigating impacts to a cultural place located on a landowner's private property. (*See Section VII and Section VIII for further information.*)

Private Conservation Efforts

Although local governments are not required to play a direct role in any private conservation activity, they can promote the use of conservation easements and other conservation programs to protect cultural places. Local governments may consider adoption of a policy to encourage voluntary landowner participation in protection programs. Local governments may also develop and distribute informational materials about potential incentives for private conservation efforts, such as Mills Act tax credits or the tax benefits of donating or selling conservation easements.

A conservation easement is a voluntary agreement between a landowner and an authorized party (including a tribe pursuant to Civil Code 815.3(c)) that allows the easement holder to limit the type or amount of development on the property while the landowner retains title to the land. The landowner is compensated for voluntarily giving up some development opportunities. The easement is binding upon successive owners of the land. It is common for a conservation

easement to be recorded against the property as a way to inform future purchasers of the existence of an easement. Granting of a conservation easement may qualify as a charitable contribution for tax purposes.

Should a landowner choose to sell a conservation easement, the landowner should first consult with all tribes affiliated with the land on which the easement is proposed. It is also recommended that tribes hold conservation easements only within their areas of cultural affiliation.

As an alternative to conservation easements, local governments may also promote private preservation of cultural places through the use of Memoranda of Understanding (MOU). As a direct agreement between a landowner and tribe, a MOU allows a tribe and landowner to agree on appropriate treatment of cultural places located on the landowner's private property and may give certain privileges to tribes, such as access to perform ceremonial rituals. MOUs may also be used to facilitate co-management by tribes, landowners, and conservation organizations. For example, if a conservation easement established for wildlife protection also contains a cultural place, the landowner, conservation entity, and tribe could agree on co-management (in the MOU) that protects both the habitat and cultural place.

Part E
Open Space

Section X provides information for incorporating the protection of cultural places into the open space element of the general plan.

X. Open Space for the Protection of Cultural Places

SB 18 amended Government Code §66560 to include open space for the protection of cultural places as an allowable purpose of the open space element. Local governments may, but are not required to, consider adopting open space policies regarding the protection of cultural places. Local governments may wish to consider the following when and if they develop such policies:

- Limiting the types of land uses allowed in an open space designation in order to protect the cultural place from potentially harmful uses.
- Facilitating access to tribes for maintenance and traditional use of cultural places.
- Protecting the confidentiality of cultural places by not disclosing specific information about their identity, location, character, or use.
- Giving developers incentives to protect cultural places through voluntary measures.
- Incorporating goals for protection of cultural places in open space that is also part of a regional habitat conservation and protection program, for example, a local or regional Habitat Conservation Plan (HCP) or Natural Community Conservation Program (NCCP).
- Reviewing and conforming other elements of the general plan that deal with conservation of natural and cultural resources to the open space element.

The development of open space policies for the protection of cultural places should be done in consultation with culturally-affiliated tribes. It is important to note that the importance of cultural places is not solely rooted in the land or other physical features or objects related to the land on which the cultural place is located. The sense of "place" is often as important as any physical or tangible characteristic. It may be important to a tribe to preserve a certain non-material aspect of a cultural place, such as views or vantage points from or to the cultural place. Cultural interpretation and importance of the place to the tribe should be taken into consideration, in addition to any potential archaeological importance of the place. With this in mind, local governments should be prepared to consider creative solutions for preservation and protection of cultural places.

Neither Government Code §65560(b)(5) nor Government Code §65562.5 mandate local review or revision of the existing open space element of the general plan to inventory and/or protect cultural places. However, local governments should consider doing so in future updates of or comprehensive revisions to the open space element.

Part F
Additional Resources

XI. Additional Resources

In addition to the information provided in the 2005 Supplement to the *General Plan Guidelines*, local governments may wish to investigate additional resources that can provide more detailed information about Native American people, cultural places, tribal governments, consultation, confidentiality, conservation easements, and other issues related to SB 18. Sources of additional information include federal and state government agencies that have previous experience with tribal consultations, colleges and universities, private organizations and foundations, and the literature and web sites associated with these groups. Although it is not intended to be a comprehensive list, some potentially useful resources are included below.

It is important that local governments keep in mind that Native American tribes are often the best source of information concerning a cultural place's location and characteristics. Local governments are encouraged to seek this information, if available, directly from the tribes themselves.

State Agencies

California Native American Heritage Commission (NAHC)

The NAHC is the state commission responsible for advocating preservation and protection of Native American human remains and cultural resources. NAHC maintains confidential records concerning places of special religious or social significance to Native Americans, including graves and cemeteries and other cultural places. The NAHC reviews CEQA documents to provide recommendations to lead agencies about consulting with tribes to mitigate potential project impacts to these sites.

The NAHC maintains a list of California tribes and the corresponding contacts that local governments should use for the purpose of meeting SB 18 consultation requirements.

The NAHC web site also provides a number of links to information about federal and state laws, local ordinances and codes, and cultural resources in relation to Native Americans.

Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814
Phone: (916) 653-4082
Fax: (916) 657-5390
http://www.nahc.ca.gov

California Office of Historic Preservation (OHP)
California Historical Resources Information System (CHRIS)
Pursuant to state and federal law, the California Office of Historic Preservation (OHP) administers the California Historical Resources Information system (CHRIS). The CHRIS is organized by county and managed by regional information centers (posted on the OHP website). These CHRIS centers house records, reports, and other documents relating to cultural and archaeological resources, and provide information and recommendations regarding such resources on a fee-for-service basis. Local governments may enter into agreements with CHRIS information centers to establish procedures and protocols for requesting searches of historical resource records.

The OHP also provides assistance to local governments to encourage direct participation in historic preservation. OHP provides technical assistance to local governments including training for local commissions and review boards, drafting of preservation plans and ordinances, and developing archaeological and historical surveys.

Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001
Phone: (916) 653-6624
Fax: (916) 653-9824
http://www.ohp.parks.ca.gov

California Department of Conservation
Division of Land Resource Protection (DLRP)
The DLRP works with landowners, local governments, and researchers to conserve productive farmland and open spaces.

California Department of Conservation
Division of Land Resource Protection
801 K Street, MS 18-01
Sacramento, CA 95814-3528
Phone: (916) 324-0850
http://www.consrv.ca.gov/DLRP/index.htm

California Department of Housing and Community Development
California Indian Assistance Program (CIAP)
The California Indian Assistance Program's primary role is to assist tribal governments with obtaining and managing funds for community development and government enhancement. CIAP's *2004 Field Directory of the California Indian Community* is a good reference for California Native American tribes, including location of Indian lands, federal recognition status of tribes, history of laws affecting tribes, and other programs and agencies involved in tribal relationships.

California Indian Assistance Program
1800 Third Street, Room 365
Sacramento, CA 95814
Phone: (916) 445-4727
http://www.hcd.ca.gov/ca/ciap/

California Department of Transportation (DOT)
Native American Liaison Branch
The California DOT administers most of its projects with some federal funding and is therefore subject to Section 106 consultation requirements under NHPA. The department has a Native American Liaison Branch (NALB), with headquarters in Sacramento and Native American Liaisons in each of its twelve districts. The NALB web site contains policy statements and links to other useful resources.

Office of Regional and Interagency Planning
Native American Liaison Branch
1120 N Street, MS 32
Sacramento, CA 95814
Phone: (916) 651-8195
Phone: (916) 654-2389
Fax: (916) 653-0001
http://www.dot.ca.gov/hq/tpp/offices/orip/na/native_american.htm

Federal Agencies

Federal Highway Administration – AASHTO (American Association of State Highway and Transportation Officials) Center for Environmental Excellence
The AASHTO Center for Environmental Excellence provides a web site designed to provide tools for Section 106 of the National Historical Preservation Act (NHPA) tribal consultation. This site contains documents and links to web sites that address key aspects of tribal consultation relevant to SB 18. Information also includes federal, tribal, and state policies and protocols, case law, and best practices as implemented by federal and state agencies and tribes.
http://environment.transportation.org/environmental_issues/tribal_consultation/overview.htm

U.S. Army Corps of Engineers
The U.S. Army Corps of Engineers has lasting and positive relations with many tribal governments. The "Tribal Affairs and Initiatives" section of their web site provides information regarding the U.S. Army Corps of Engineers' approach to tribal consultation and preservation of cultural resources.
http://www.usace.army.mil/inet/functions/cw/cecwp/tribal/index.htm

USDA Forest Service
The Forest Service has extensive experience in consulting with Native American tribes. The Forest Service's *Forest Service National Resource Book on American Indian and Alaska Native Relations* is an excellent resource book on tribal beliefs and practices, tribal consultation, and laws affecting Native Americans. The Forest Service's *Report of the National Tribal Relations Program Implementation Team* (June 2003) reviews relationships between the Forest Service and tribes, identifying pervasive problems and concerns and making recommendations to improve the effectiveness of the program at maintaining long-term collaborative relationships with tribal governments.

USDA Forest Service
Regional Office of Tribal Relations
Sonia Tamez
1323 Club Drive
Vallejo, CA 95492
Phone: (707) 562-8919
www.r5.fs.fed.us

USDA National Sustainable Agriculture Information Service (ATTRA)
The ATTRA provides information and other technical assistance to farmers, ranchers, Extension agents, educators, and others involved in sustainable agriculture in the United States. The ATTRA publication, *Conservation Easements, Resource Series (2003)*, provides an overview of what holding and selling conservation easements entail.

ATTRA - National Sustainable Agriculture Information Service
PO Box 3657
Fayetteville, AR 72702
Phone: (800) 346-9140
Fax: (479) 442-9842
http://attra.ncat.org/

USDA Natural Resources Conservation Service (NRCS)
The mission of the NRCS is to address natural resource conservation on private lands. The web site contains links to various conservation technical resources and to additional contact information for area offices and service centers.

California NRCS State Office
430 G Street #4164
Davis, CA 95616-4164
Phone: (530) 792-5600
Fax: (530) 792-5610
http://www.ca.nrcs.usda.gov/

U.S. Department of Interior – Bureau of Indian Affairs
The Bureau of Indian Affairs (BIA) is responsible for the administration and management of 55.7 million acres of land held in trust by the United States for American Indians, Indian tribes, and Alaska Natives. Developing forestlands, leasing assets on these lands, directing agricultural

programs, protecting water and land rights, developing and maintaining infrastructure, and economic development are all agency responsibilities. The BIA web site includes links to other federal agencies, inter-tribal organizations, environmental organizations, and cultural resources.

Bureau of Indian Affairs
Phone: (202) 208-3710
http://www.doi.gov/bureau-indian-affairs.html

U.S. Department of Interior – Bureau of Land Management
The Bureau of Land Management manages 261 million acres of land and has staff whose duties include coordination and consultation with Native Americans. The Bureau publishes *Native American Coordination and Consultation, Manual Section 8160 with Handbook H-8160-1*. The handbook is devoted to providing general guidance for tribal consultation, and can be found online at: http://www.blm.gov/nhp/efoia/wo/handbook/h8160-1.html.

Bureau of Land Management
California State Office
2800 Cottage Way, Suite W-1834
Sacramento, CA 95825-1886
Phone: (916) 978-4400
Phone: (916) 978-4416
TDD: (916) 978-4419
http://www.ca.blm.gov/

U.S. Department of Interior- National Park Service
The following National Park Service web site specifically focuses on cultural resource preservation. The site includes links to tools for cultural resource preservation, different areas of cultural resource protection and different offices of the National Park Service that handle cultural preservation issues. Included among these offices is the American Indian Liaison Office, the web site of which contains a number of information resources that are potentially useful to local governments learning how to consult with Native American tribes on land use policy.
http://www.cr.nps.gov

U.S. Department of Interior – Office of Collaborative Action and Dispute Resolution
This web site provides links to federal agencies' policies on tribal consultation:
http://mits.doi.gov/cadr/main/G2GAgencyPolicies.cfm

Colleges and Universities

Humboldt State University
The Center for Indian Community Development (CICD)
The CICD primarily focuses on Indian language education, but also acts in the capacity of a liaison between Native American tribes and the community. The CICD includes a cultural resource facility where information about Native American burial grounds and cultural resource monitoring can be found. The CICD offers useful publications on tribal governments and cultural approaches to environmental protection of Native American lands on its web site.

Humboldt State University
Center for Indian Community Development
#1 Harpst Street
Arcata, CA 95521
Phone: (707) 826-3711
http://www.humboldt.edu/~cicd/

University of California, Los Angeles
American Indian Studies Center (AISC)
The AISC has spent a number of years conducting research on issues affecting Native American Indian communities. The center has sponsored conferences on issues including California tribes, repatriation, federal recognition, and Indian gaming. The AISC offers a number of publications on issues ranging from Contemporary Native American Issues and Native American Politics to Native American Theater and Native American Literature.

UCLA American Indian Studies Center
3220 Campbell Hall
Los Angeles, CA 90095-1548
Phone: (310) 825-7315
Fax: (310) 206-7060
http://www.aisc.ucla.edu/

University of California, Los Angeles School of Law
Native Nations Law and Policy Center (NNLPC)
The mission of NNLPC at UCLA Law is to support Native nations throughout the United States, with a special focus on California tribes, in developing their systems of governance and in addressing critical public policy issues and to apply the resources of state-supported education together with tribal expertise to address contemporary educational needs for California Tribes. The Research and Publications division secures grants, carries out research, and sponsors conferences and roundtables drawing together scholars, tribal leaders, and federal/state policy-makers.

UCLA School of Law
P.O. Box 951476
Los Angeles, CA 90095-1476
Phone: (310) 825-4841
http://www.law.ucla.edu/students/academicprograms/nativenations/nnlapc.htm

Private Organizations and Foundations

American Farmland Trust (AFT)
Since its founding in 1980, the AFT has helped to achieve permanent protection for over a million acres of American farmland. The AFT focuses its strategies on protecting land through publicly funded agricultural conservation easement programs and encouraging conservation practices in community planning and growth management.

American Farmland Trust
1200 18th Street NW
Washington, D.C. 20036
Phone: (202) 331-7300
Fax: (202) 659-8339
http://www.farmland.org/

Inter-Tribal Council of California, Inc. (ITCC)
The key role of the Inter-Tribal Council of California (ITCC) is to assist in bridging relationships between California tribal governments and other organizations, including local government agencies. The ITCC offers workshops on Native American cultural proficiency and tribal governments for the purpose of educating non-Native Americans on how to effectively communicate with tribal governments, in addition to other training and technical assistance. The ITCC is experienced in assisting the development of Memoranda of Understanding and Agreement, protocols, and educational outreach materials.

Inter-Tribal Council of California, Inc.
2755 Cottage Way, Suite 14
Sacramento, CA 95825
Phone: (916) 973-9581
Fax: (916) 973-0117

Land Trust Alliance (LTA)
The Land Trust Alliance promotes voluntary land conservation by offering training, conferences, literature, reports, and other information on land conservation. The LTA has several publications discussing conservation techniques. Their web site addresses different conservation options for landowners and includes questions and answers about conservation easements, land donation, and bargain sale of land.

Land Trust Alliance
1331 H Street NW, Suite 400
Washington D.C. 20005-4734
Phone: (202) 638-4725
Fax: (202) 638-4730
http://www.lta.org/conserve/options.htm

Native American Land Conservancy
The Native American Land Conservancy is a nonprofit corporation formed for the conservation and preservation of Native American sacred lands.

Native American Land Conservancy
Kurt Russo, Executive Director
PO Box 1829
Indio, CA 92202
Phone: (800) 6770-6252

The Nature Conservancy (TNC)
The Nature Conservancy is a non-profit organization that works with communities, businesses, and individuals to preserve lands with natural and cultural resources.

The Nature Conservancy
4245 North Fairfax Drive, Suite 100
Arlington, VA 22203-1606
http://nature.org/

Southern California Tribal Chairmen's Association (SCTCA)
The Southern California Tribal Chairmen's Association (SCTCA) is a multi-service non-profit corporation established in 1972 for a consortium of 19 Federally recognized Indian tribes in Southern California. The Primary goals and objectives of SCTCA are the health, welfare, safety, education, culture, economic and employment opportunities for its tribal members. A board of directors comprised of tribal chairpersons from each of its member tribes governs SCTCA.

Southern California Tribal Chairmen's Association
Denis Turner
Executive Director
Phone: (760) 742-8600 x100
http://www.sctca.net/

Trust for Public Land (TPL)
The Trust for Public Land (TPL) is a national, nonprofit, land conservation organization that conserves land for people to enjoy as parks, community gardens, historic sites, rural lands, and other natural places, ensuring livable communities for generations to come. Since 1972, TPL has worked with willing landowners, community groups, and national, state, and local agencies to complete more than 2,700 land conservation projects in 46 states, protecting nearly 2 million acres.

Trust for Public Land National Office
116 New Montgomery St., 4th Floor
San Francisco, CA 94105
Phone: (415) 495-4014
Fax: (415) 495-4103
http://www.tpl.org

Exhibit A: Sample Request to the NAHC for Tribal Contact Information

LOCAL GOVERNMENT
TRIBAL CONSULTATION LIST REQUEST
NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
(916) 657-5390 - Fax

Project Title: _____

Local Government/Lead Agency: _____ Contact Person: _____

_____ Phone: _____

Street Address: _____ Fax: _____

City: _____ Zip: _____

Project Location:

County: _____ City/Community: _____

Local Action Type:

___ General Plan ___ General Plan Element ___ Specific Plan

___General Plan Amendment ___ Specific Plan Amendment

___ Pre-planning Outreach Activity

Project Description:

NAHC Use Only

Date Received: _____

Date Completed _____

Native American Tribal Consultation lists are only applicable for consulting with California Native American tribes per Government Code Section 65352.3.

Appendix F
Phase I & II
Environmental Site
Assessment

Converse Consultants

Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

Phase I Environmental Site Assessment Report

Approximate 17 Acre Lot Located at
Live Oak Avenue and Arrow Highway
APN 8535-001-911
Irwindale, California

CONVERSE Project No. 09-42-138-01
Draft Report Issued: July 8, 2009
Revised Draft Report Issued: August 4, 2009
Final Report Issued: November 3, 2009

Prepared For:

City of Irwindale
5050 North Irwindale Avenue
Irwindale, California 91706

Prepared By:

CONVERSE CONSULTANTS
185 East Paularino Avenue, Suite B
Costa Mesa, California 92626

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

July 8, 2009
Revised Draft: August 4, 2009
Final: November 3, 2009

Mr. Jose Amador
City of Irwindale
5050 North Irwindale Avenue
Irwindale, California 91706

Subject: **PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT**
Approximate 17 Acre Lot Located at Live Oak Avenue and Arrow Highway
APN 8535-001-911
Irwindale, California
Converse Project No. 09-42-138-01

Mr. Amador:

Converse Consultants (Converse) is pleased to submit the attached report that summarizes the activities and the results of a Phase I Environmental Site Assessment (Phase I ESA) that was conducted at the referenced property (Property).

We appreciate the opportunity to be of service. Should you have any questions or comments regarding this report, please contact Laura Tanaka at (714) 444-9660, ext. 110.

CONVERSE CONSULTANTS

Heidi Yavornicky
Sr. Staff Environmental Scientist

Laura Tanaka
Principal Environmental Scientist

Dist.: 3/Bound Copes
1/Electronic File (PDF)

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Executive Summary

The following is an Executive Summary of the Phase I Environmental Site Assessment (ESA) that was conducted by Converse Consultants (Converse). Please refer to the appropriate sections of the report for a complete discussion of these issues. In the event of a conflict between this Executive Summary and the report, or an omission in the Executive Summary, the report shall prevail.

This report presents the results of the Converse Phase I ESA performed at a 17 acre lot located at Live Oak Avenue and Arrow Highway (Los Angeles County Assessor's Parcel Number [APN] 8535-001-911), in the City of Irwindale, County of Los Angeles, California, referred to as the Property in this report. Converse was retained by the City of Irwindale to conduct this Phase I ESA. Our study has been conducted in order to identify, to the extent feasible, Recognized Environmental Conditions (RECs) in connection with the Property.

Converse has compiled and reviewed information that was obtained from interviews, document research, and on-site and area reconnaissance to identify potential environmental conditions at the Property, in conformance with *the* ASTM Standard E: 1527-05 Environmental Site Assessment Standard Practice (ASTM Standard: E1527-05). This Phase I ESA was conducted during the period of June 10, 2009 to November 3, 2009.

The Property currently consists of an approximate 17 acre, triangular-shaped vacant lot located west of the intersection of Live Oak Avenue and Arrow Highway. Access to the Property is from a partially improved driveway off of Live Oak Canyon. The Property is surrounded by chain-link fencing, and trees and shrubs line the western and southern boundaries. A Los Angeles Department of Water and Power easement (powerlines) and concrete enclosure with electrical meters is located on the southern portion of the Property. The Property is located adjacent southwest of the Santa Fe Flood Control Basin, and approximately ½-mile east of the San Gabriel River (605) Freeway.

The Property historically appeared to be undeveloped land as early as 1928-29. By 1936, the Property appeared to be developed as a portion of a larger industrial facility (United Concrete Pipe Corp.) until 1990. The Property appears to have remained largely vacant since 1991.

Based on the information obtained during this assessment, United Concrete Pipe Corp. was located at 14041 Live Oak Avenue was identified on several databases, including the ENVIROSTOR database, where in 1990 "No Further Action" was reported by the Department of Toxic Substances Control (DTSC). In addition, United Concrete Pipe Corp. reportedly had seven (7) USTs installed onsite in 1974, and an "Open" SLIC case as of 1965 was identified under Koll Business.

According to agency records, one 8,000-gallon and two (2) 10,000-gallon underground storage tanks (USTs) near the centrifugal area (north-central portion of the Property) were removed in October 1987. Sample results indicated the maximum concentration of petroleum hydrocarbons detected was 140 milligrams per kilogram (mg/kg). Based on the report, closure was granted by the Los Angeles County, Department of Public Works (DPW). However, a May 25, 2000 Regional Water Quality Control Board (RWQCB) letter indicated that the previous UST removals and closures at the United Concrete Pipe facility did not include testing for methyl tertiary butyl ether (MTBE). Records of such testing were not found in the RWQCB file or any other agency records. In addition, sampling activities pertaining to the Property area of United Concrete Pipe did not include the laboratory analysis for VOCs in soil or any soil vapor assessment.

During our Property reconnaissance, Converse observed the following at the Property:

- An approximate 10,000-gallon aboveground storage tank and associated pump on the south-central portion of Property.
- Concrete pads on the eastern portion of the Property. It was not apparent if these pads were from previous structures or equipment.
- Several piles of concrete debris and roofing materials on the southern portions of the Property. In addition to the concrete and roofing materials piles, minor trash and debris including trash cans full of sand, metal and plastic piping, and rubber hosing was observed onsite. No leaks, stains, or odors were observed or detected in the vicinity of the trash and debris observed.
- A Los Angeles Department of Water and Power easement (powerlines) and concrete enclosure with electrical meters on the southern portion of Property.

This assessment has revealed no evidence of RECs in connection with the Property, except for the following:

- The historic industrial use of the Property including manufacturing, the use of USTs, an AST, and cesspools;
- The historic and current use of industrial properties that adjoin the Property;
- Roofing material debris.

Based on the findings of this Phase I ESA, further assessment appears warranted including, but not limited to, the following:

- Phase II assessment activities to assess historic features associated with the former United Concrete Pipe Corp. facility. The Phase II activities should include soil sampling at a minimum for MTBE, and a soil vapor survey.
- Roofing debris material should be analyzed for asbestos prior to disposal.
- All trash and debris, including the AST, located on the Property will need to be disposed of appropriately.

1.0 Introduction

1.1 Purpose and Scope of Services

This report presents the results of the Converse Consultants (Converse) Phase I Environmental Site Assessment (ESA) performed at a 17 acre lot located at Live Oak Avenue and Arrow Highway (Los Angeles County Assessor's Parcel Number [APN] 8535-001-911), in the City of Irwindale, County of Los Angeles, California, referred to as the Property in this report. Converse was retained by the City of Irwindale to conduct this Phase I ESA. Our study has been conducted in order to identify, to the extent feasible, Recognized Environmental Conditions (RECs) in connection with the Property. The term Recognized Environmental Conditions is defined in Section 1.1.1 of the American Society of Testing and Materials (ASTM) Standard Practice as *the presence or likely presence of any hazardous substances or petroleum products on a property under Conditions that indicate an existing release, past release, or material threat of a release… into structures on the property or into the ground, ground water or surface water of the property.*

On January 11, 2002, Public Law 107-118 was signed. The Small Business Liability Relief and Brownfields Revitalization Act (SBLRBRA) directed the United States Environmental Protection Agency (EPA) to promulgate a rule defining due diligence for compliance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This rule, which is generally referred to as All Appropriate Inquiry (AAI) was adopted on November 1, 2005. The AAI rule states that ASTM E1527-05 complies with the EPA requirements for AAI. In some cases the ASTM 1527-05 is more stringent than AAI.

This Phase I ESA was completed in accordance with our proposal dated June 3, 2009. Our work consisted of the following and was completed in general conformance with the scope and limitations of the ASTM Practice E1527-05 and complies with standards and practices set forth in 40 Code of Federal Regulations (CFR) Part 312 for AAI.

- Interviews with the Property owner representatives
- Property and vicinity reconnaissance
- Review of regulatory agency records
- Description of physical setting
- Historical review
- Interviews with public agency personnel
- Preparation of this report

1.2 Non-Scope Considerations

There are a number of non-scope issues which are sometimes assessed concurrently with a Phase I ESA. Unless specifically agreed in the contract proposal documents, these non-scope considerations are not included as part of the Phase I assessment. Examples of non-scope issues include:

- Asbestos-containing building material
- Lead-base Paint
- Wetlands
- Cultural & Historic Resources
- Industrial Hygiene
- Health & Safety
- Mold
- Radon
- Lead in Drinking Water
- Regulatory Compliance
- Ecological Resources
- Endangered Species
- Indoor Air Quality
- Biological Agents

No Non-scope issues were addressed in this report.

1.3 Significant Assumptions

No assumptions were made for this assessment that needs to be noted as significant.

1.4 Limitations and Exceptions

There were no limitations or exceptions encountered during this assessment.

1.5 Special Terms and Conditions

No other users were identified by the City of Irwindale. The Client was responsible for providing Attachment A of the proposal to those identified. Converse receive a completed Attachment A, or other documents, from the identified users.

1.6 Reliance

This report is for the sole benefit and exclusive use of the City of Irwindale in accordance with the terms and conditions attached to our proposal under which these services have been provided. Its preparation has been in accordance with generally accepted environmental practices. No other warranty, either express or implied, is made. This report should not be regarded as a guarantee that no

generally accepted environmental practices. No other warranty, either express or implied, is made. This report should not be regarded as a guarantee that no further contamination beyond that which could be detected within the scope of this assessment is present at the Property.

The conclusions and recommendations presented in this report are based on the agreed upon scope of work. Converse makes no warranties or guarantees as to the accuracy or completeness of information provided or compiled by others. It is possible that information exists beyond the scope of this assessment. It is not possible to absolutely confirm that no hazardous materials and/or substances exist at the Property. If none are identified as part of a limited scope of work, such a conclusion should not be construed as a guaranteed absence of such materials, but merely the results of the evaluation. Also, events may occur after the Property visit, which may result in contamination of the Property. Additional information, which was not found or available to Converse at the time of report preparation, may result in a modification of the conclusions and recommendations presented. Any reliance on this report by Third Parties shall be at the Third Party's sole risk.

2.0 Property Description

2.1 Current Use(s) of the Property

The Property is currently a vacant lot.

A Property location map and a field generated Property plan are provided in Appendix A. Pertinent Property photographs are provided in Appendix B.

2.2 Location and Legal Description

The Property is located west of the intersection of Live Oak Avenue and Arrow Highway, in the City of Irwindale, County of Los Angeles, California. The Property is located adjacent southwest of the Santa Fe Flood Control Basin, and approximately ½-mile east of the San Gabriel River (605) Freeway.

The Los Angeles County Assessor's Parcel Number (APN) for the Property is 8535-001-911. The legal description of the Property is described as the following:

P M 231-15-18 LOT 2

During the course of this assessment, it was found that the Property was historically a part of 14041 E. Live Oak Avenue.

2.3 Zoning Information

According to the City of Irwindale, Planning Department, the zoning for the Property is Heavy Manufacturing (M2).

2.4 Property Characteristics

The Property is consists of an approximate 17 acre, triangular-shaped vacant lot. Access to the Property is from a partially improved driveway off of Live Oak Canyon. The Property is surrounded by chain-link fencing. Trees and shrubs line the western and southern Property boundaries.

A Los Angeles Department of Water and Power easement (powerlines) and concrete enclosure with electrical meters is located on the southern portion of the Property.

The Property fronts onto Live Oak Avenue to the south. Located in the general vicinity are residential, commercial, and industrial properties.

2.5 Description of Property Structure(s)

The Property is generally vacant with the exception of the following structures:

- An approximate 10,000-gallon aboveground storage tank and associated pump (south-central portion of Property);
- A Los Angeles Department of Water and Power easement (powerlines) and concrete enclosure with electrical meters (southern portion of Property).

The following services were present at the Property vicinity at the time of the assessment.

- Electricity: Southern California Edison
- Gas: Southern California Gas Company
- Potable Water: Valley County Water
- Sanitary Sewer: City of Irwindale
- Heating, Ventilation, Air Conditioning (HVAC): Not Applicable
- Solid Waste: Athens

3.0 User/Owner Provided Information & Responsibilities

3.1 Requested Documents and Information

The ASTM E1527 specifies that the Property owner, key site manager and the User provide any helpful documents that may be available. In order to facilitate, and document, the collection of this information, Converse prepared a form titled Owner Interview and Helpful Information. Converse requested that the User, and current Property owner, the City of Irwindale, complete the form.

The following documents and information were requested; however, the City of Irwindale provided no information.

- Environmental site assessment or environmental compliance audit reports
- Environmental permits or hazardous waste generator notices/reports
- Registrations for aboveground and underground storage tanks
- Septic systems, oil wells, or water wells
- Registrations for underground injection systems
- Material Safety Data Sheets; Community Right to Know Plans; or Safety, Preparedness and prevention Plans; Spill Protection Countermeasures and Control Plans
- Reports regarding hydrologic conditions on the Property or surrounding area
- Notices or other correspondence form any government agency relating to past or current violations of environmental laws with respect to the Property or relating to environmental liens encumbering the Property.
- Hazardous waste generator notices or reports
- Geotechnical studies
- Risk assessments
- Recorded Activity Use Limitations (AULs)
- Proceedings regarding hazardous substances and petroleum products including any pending, threatened or past: litigation; administrative proceedings; or notices from any governmental entity regarding possible violations of environmental laws or other possible liability related to hazardous substances or petroleum products.

3.2 User Provided Information

Section 6 of ASTM E1527-05 outlines specific User's responsibilities. This information will help identify the possibility of RECs in connection with the Property. The ASTM Standard provides a questionnaire to help the User to comply with the statutory requirements to perform tasks which would help identify RECs. Converse included the questionnaire as Attachment A to our proposal. In

general, any Users should make Converse aware of information they have regarding the following:

- Environmental cleanup Liens filed or recorded against the Property
- Activity and land use limitations that are in place on the Property or have been filed or recorded in a registry.
- Specialized knowledge or experience of the person seeking to qualify for the Legal Liability Protections (LLP)
- Relationship of the purchase price to fair market value of the Property if it were not contaminated
- Commonly known or reasonably ascertainable information about the Property
- The degree or obviousness of the presence or likely presence of contamination at the Property, and the ability to detect this contamination by appropriate investigation.

The following information was requested from the User, the City of Irwindale, and a Property owner representative:

3.2.1 Environmental Cleanup Liens

The User provided no information regarding environmental cleanup liens or title records; however, an Environmental LienSearch Report was ordered specifically for the Property from Environmental Data Resources, Inc. (EDR). According to the report, no environmental liens were found. A copy of the Environmental LienSearch Report is provided in Appendix C.

3.2.2 Activity and Use Limitations (AULs)

The User provided no information indicating they were aware of any AULs; however, an Environmental LienSearch Report ordered specifically for the Property indicated that no AULs were found.

3.2.3 Specialized Knowledge or Experience

The User had no information indicating they had specialized knowledge or experience related to the Property or nearby property.

3.2.4 Reason for Significantly Lower Purchase Price

Converse has no information regarding the purchase price of the Property or comparable properties. The User did not indicate to Converse that there is any conclusion that there was a lower purchase price because of known or suspected contamination at the Property.

3.2.5 Commonly Known or Reasonably Ascertainable Information

The User had no information about; past uses; specific chemicals at the Property; past spills; environmental cleanup or other reasonably ascertainable information regarding the Property.

3.2.6 Obviousness of Contamination

The User had no information regarding their knowledge or experience that would be obvious indicators of contamination on the Property.

Unless specifically stated otherwise in the Scope of Services, the purpose of this Phase I ESA was to qualify for the landowner liability protections to CERCLA Liability as described in ASTM E1527-05.

3.3 Continuing Obligations

In order to exert a LLP, the User must satisfy a number of statutory requirements that are generally referred to as Continuing Obligations, which are outside the Scope of Services of the Phase I ESA. Examples of Continuing Obligations include providing legally required notices stopping continuing releases and complying with land use restrictions. Failure to comply with these and other statutory post-acquisition requirements will jeopardize liability protection.

It is the responsibility of the User to comply with the Continuing Obligations requirements of ASTM E1527-05 and AAI.

4.0 Records Review

4.1 Physical Setting

4.1.1 Geology

The Property is located approximately 415 feet above mean sea level with surface topography sloping towards the southwest (United States Geological Survey [USGS] Topographic Map, Baldwin Park, California, 1966 photorevised 1981).

The Property is underlain by unconsolidated and semi-consolidated alluvium, lake, playa, and terrace deposits (Division of Mines and Geology, Geologic Map of California, 1991).

4.1.2 Groundwater

According to the Los Angeles County, Department of Public Works (DPW), online Groundwater Wells Website, the nearest groundwater wells to the Property (4239G and 4329H) are located adjacent to the south of the Property. Depth to groundwater at these wells was last recorded to be 219.2 (4239G) and 218.2 (4329H) feet below ground surface in October 2008.

According to the DPW San Gabriel Valley Groundwater Contour, Fall 1997 map, the direction of regional groundwater flow is to the southwest.

The Property is located in Area 2 of the San Gabriel Valley Groundwater Basin, which is identified as an Area of Concern due to regional groundwater contamination from volatile organic compounds (VOCs). See Section 4.3.1 for more information.

4.1.3 Potable Water Supplier

Potable water is supplied by Valley County Water via local wells and treatment facilities.

4.2 Historical Review

4.2.1 Aerial Photograph and Map Review

Available historical aerial photographs (Fairchild Aerial Photograph Collection) and USGS topographic maps, as described in Table 1, were

reviewed. Converse requested Sanborn Fire Insurance maps from EDR; however, there is no Sanborn map coverage of the Property.

Table 1 – Aerial Photograph and Map Review

Date	Reference	Observations
1928-29 and 1932	Aerial Photographs	The Property appeared to be undeveloped land with scattered unimproved trails. Adjacent to the north appeared to be a creek/wash. Adjacent to the south appeared to be agricultural and vacant land, and a residential property. Adjacent to the east appeared to be undeveloped land. Adjacent to the west appeared to be a creek/wash. The greater surrounding area appeared to be sparsely populated.
1938	Aerial Photograph	The southwestern portion of the Property appeared to be developed with a large industrial building. The remainder of the Property appeared to be vacant. Adjacent to the north appeared to be a creek/wash. Adjacent to the south appeared to be a road (currently Live Oak Canyon), followed by vacant land and a residential property. Adjacent to the east appeared to be undeveloped land. Adjacent to the west appeared to be a creek/wash. The greater surrounding area appeared to be sparely populated.
1943, 1945, 1947, 1948 (partial coverage), 1949, 1951, 1952, 1953, 1954, and 1958 1953	Aerial Photographs Topographic Map	The Property appeared to be developed as a portion of a large industrial facility. The southwestern portion of the Property appeared to be developed with a large industrial building (similar to 1938 photograph). One additional building was noted to the northeast of the large industrial building. A series of cables appeared to connect the buildings. A small portion of a railroad spur and/or cable appeared to be located just north of the large industrial building. Powerlines were depicted on the southern portion of the Property, traversing east to west. The remainder of the Property appeared to be primarily exterior product or container storage with a few large sheds/buildings, with the exception of the very eastern corner, which appeared to remain undeveloped. Adjacent to the north appeared to be a road (currently Arrow Highway), followed by the Santa Fe Flood Control Basin. Adjacent to the south appeared to be Live Oak Canyon, followed by two (2) large aboveground storage tanks and vacant land. Adjacent to the east appeared to be the intersection of Live Oak Canyon and Arrow Highway, followed by landscaping and the continuation of the Santa Fe Flood Control the remainder of the large industrial facility of which the

Table 1 – Aerial Photograph and Map Review

Date	Reference	Observations
		Property was a portion, including additional smaller buildings, cable systems and railroad spurs. The greater surrounding area appeared to be densely populated with a mixture of commercial and industrial properties, with residential properties further south, east, and west. The San Gabriel Channel was depicted west of the Property, and a gravel pit was depicted further southeast of the Property.
1958-66, 1977, 1983, and 1987 1966 and 1981	Aerial Photographs Topographic Maps	No significant changes were noted to the Property, adjacent properties, or greater surrounding area since the 1958 photograph, with the exception that the large industrial building (southwestern portion of Property) and the building northeast of the large industrial building appeared to be larger in size. In addition, the cable and/or railroad spurs previously onsite remained on the west adjacent property only. Also, south adjacent to the Property appeared to be developed with several commercial and/or industrial properties (west of the aboveground storage tanks). An additional gravel pit was depicted north-northwest of the Property, and a substation was depicted further west-southwest of the Property.
1991	Aerial Photograph	The entire Property appeared to have been cleared of the previously noted industrial features with the exception of several parked vehicles and/or containers on the southern portion of the Property, north of the powerlines. The very eastern portion of the Property was not covered on the photograph. Adjacent to the north appeared to be Arrow Highway, followed by the Santa Fe Flood Control Basin. Adjacent to the south appeared to be Live Oak Avenue, followed by several commercial and/or industrial properties and vacant land. Adjacent to the east was not covered on the photograph. Adjacent to the west appeared to be vacant land (cleared of natural vegetation). The greater surrounding area remained densely populated.
1993, 1999, and 2004	Aerial Photographs	The Property appeared to be entirely vacant, with the exception of the powerlines and a feature similar to an aboveground storage tank (south-central portion of Property). Trees were noted on the eastern portion of the Property. Adjacent to the north appeared to be Arrow Highway, followed by landscaping, an apparent nursery and the Santa Fe Flood Control Basin. Adjacent to the south appeared to be Live Oak Avenue, followed by several commercial and/or light industrial properties and two

Table 1 – Aerial Photograph and Map Review

Date	Reference	Observations
		large aboveground storage tanks. Adjacent to the east appeared to be the intersection of Live Oak Avenue and Arrow Highway, with some landscaping. Adjacent to the west appeared to be a large commercial building. The greater surrounding area appeared to remain densely populated.

4.2.2 Building Permit Review

The City of Irwindale provided numerous Building and Safety records, as well as Planning records, for review of the United Concrete Pipe Corp. at 14041 Live Oak Avenue, of which the Property was a portion of historically. The records reviewed are summarized in order to identify historic uses onsite, as well as identify obvious environmental concerns (i.e., installation of a UST, clarifier, etc.).

According to the records, United Concrete Pipe Corp. appeared to have already been developed by 1936. A large expansion appeared to have occurred largely between 1957 to 1960, where the construction of batch plant, craneway, bins, alterations of monorails, and other related buildings and structures (including cesspools and onsite sewer septic tank systems) had been constructed.

A 1987 Preliminary Foundation Investigation (Triad Foundation Engineering Inc.) of a proposed silo onsite (as well as a 1990 demolition permit) provided a map of the United Concrete Pipe Corp. It appeared that the main shop building, a personnel office, water well and pump, office building, craneway, ring plant, batch plant, boiler room, and centrifugal were located onsite, with the remainder of the United Concrete Pipe Corp. facility to the west.

The United Concrete Pipe Corp. facility appeared to have been demolished in 1990, and the Property appeared to have been graded in 1992.

4.2.3 City Directories

A city directory search was completed on the Property by EDR utilizing adjacent property addresses, as the historic address associated with the Property (14041 E. Live Oak Avenue) was not known at the time of the order. The complete city directory is provided in Appendix C, EDR-City Directory.

The Property was not identified in the city directories researched by EDR. Several adjoining properties were identified as follows:

Table 2 – City Directory Summary

Adjacent Property Address	Listing	Year
14140 Live Oak Avenue (adjacent to the south)	• Acme Portable Machines • Office Building (5 Occupants)	2008
	• Acme Portable Machines • Nichols Sales Inc	2000
	• Multi Duti Mfg Inc. • Office Building (7 Occupants)	1994
	• Multi Duti Mfg Inc • Office Building (6 Occupants) • Sinecera Mfg Co	1990
	• MDM Inc • Princeton MFG Co	1986
14160 Live Oak Avenue (adjacent to the south)	• Office Building (6 Occupants)	2008
	• Ferreira Service • Shelcomm • Sunburst Drapery	2000
	• Office Building (5 Occupants)	1994
	• Office Building (6 Occupants)	1990
	• HLC Electric Supply	1986
14180 Live Oak Avenue (adjacent to the south)	• Office Building (6 Occupants)	2008
	• Office Building (6 Occupants)	2000
	• Office Building (5 Occupants)	1994
	• Office Building (8 Occupants)	1990
	• Bart Enterprises • Charleyca Inc. • Jona Suoo Entp • Steno Aide Inc	1986
14254 Live Oak Avenue (adjacent to the south)	• K J Patterson Inc.	2008
	• Residential	2000
	• Ascot Basket Works	1994
	• No Return	1990

No other properties were identified in the EDR-City Directory.

4.2.4 Data Failure

Historical information regarding the Property was dated as early as 1928-29; therefore, there is no historical data failure for this assessment.

4.2.5 Summary of Historical Property Use

The Property appeared to be undeveloped land as early as 1928-29. By 1936, the Property appeared to be developed as a part of a larger industrial facility (United Concrete Pipe Corp.) until 1990. The Property appears to have remained largely vacant since 1991.

4.2.6 Summary of Past Uses of Adjoining Properties

The north adjacent property was an undeveloped creek/wash as early as 1928-29 until the development of the Santa Fe Flood Control Basin sometime prior to 1943.

The west adjacent property also appeared to be an undeveloped creek/wash until its development as a part of a large industrial facility by 1938. Sometime prior to 1993 the west adjacent property appeared to have been redeveloped into a commercial property.

The south adjacent property appeared to historically be residential, agricultural and/or vacant land from at least 1928-29 until the development of two aboveground storage tanks in 1943, and commercial and/or industrial development by 1987.

The east adjacent property appeared to be undeveloped land as early as 1928-20, until the development of the intersection of Live Oak Avenue and Arrow Highway by 1943.

4.2.7 Summary of Past Uses of the Surrounding Area

The surrounding area appeared to be densely populated by the 1940s with a mix of residential, commercial and industrial uses, including gravel pits.

4.3 Results of Environmental Records Sources Review

An Environmental Data Resources, Inc. (EDR) report of Standard Environmental Record Sources (Records) was prepared specifically for the Property. The search included queries to the following databases for cases within specified ASTM search distances. The search radii were expanded by ¼-mile in order to cover the Property. A copy of the EDR-Radius Map report is provided in Appendix E.

4.3.1 Property Listings

United Concrete Pipe Corporation and Koll Business at 14041 E. Live Oak Avenue (of which the Property was a portion of) was identified on the following databases in the EDR report:

ENVIROSTOR
The Department of Toxic Substances Control's (DTSCs) Site Mitigation and Brownsfields Reuse Program's ENVIROSTOR database identifies sites that have known contamination or sites for which there may be reasons to investigate further.

According to the EDR report, United Concrete Pipe Corporation was listed as a historical ENVIROSTOR site, where in 1990 “No Further Action” was reported by the DTSC. It appeared that in 1990 and 1994, the DTSC oversaw a site screening and Preliminary Endangerment Assessment Report. The DTSC gave the site a no further action designation due to the lack of significant hazardous constituents in the soil. Mineral oil was listed as the primary contaminant in the soil which the DTSC did not consider to be hazardous. The EDR report stated that the site manufactured large concrete pipe sections for pipelines and sewers.

RCRA Generators List (RCRA-SQG/RCRA-LQG)

The EPAs RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. This is a database which lists facilities which generate, store, transport, treat, or dispose of hazardous waste. Small quantity facilities generate less than 1,000 kilograms per month of non-acutely hazardous waste. Large quantity facilities generated at least 1,000 kilograms per month of non-acutely hazardous waste or one kilogram per month of acutely hazardous waste.

According to the EDR report, the site was reported as a small quantity generator and a historic large quantity generator with no violations reported.

FINDS

Facility Index System (FINDS) contains both facility information and ’pointers’ to other sources that contain more detail.

The pertinent environmental activity identified at this site is being identified on RCRAInfo (database).

Hazardous Waste & Substances Sites List (HIST CORTESE)

Historic database of sites which have been identified as leaking underground storage tank sites, landfills, or Cal-Sites.

No pertinent information was provided in the database listing.

Leaking underground Storage Tanks (LUST) Sites

An inventory of reported leaking underground storage tank incidents reported to the state.

According to the EDR report, United Concrete Pipe Corporation was listed as a “completed-case closed” LUST site as of 1994. Reportedly, waste, hydraulic and/or lubricating oil had potentially contaminated onsite soils. The EDR report indicated that the Los Angeles Department of Public Works (DPW) required no further action, and that the Los Angeles Regional Water Quality Control Board (RWQCB) – Well Investigation Program (WIP) issued a no further action letter in November 1994.

Historical and Active Underground Storage Tank (UST) Sites

An inventory of USTs identified on the following databases: Facility Inventory Database (CA FID UST); UST; Hazardous Substance Storage Container Database (HIST UST); and Statewide Environmental Evaluation and Planning System (SWEEPS UST).

United Concrete Pipe Corporation reportedly had seven (7) USTs installed onsite in 1974.

RWQCB – Site Cleanup (SLIC)

Review of the RWQCB SLIC list.

According to the EDR report, no further action (United Concrete Pipe Corporation) was required by the RWQCB SLIC unit; however, no other information regarding this case was provided.

In addition, an “Open” case as of 1965 was identified in the EDR report under Koll Business.

Los Angeles County Site Mitigation Log (LA Co. Site Mitigation)
Review of the Los Angeles County Site Mitigation Log from the Community Health Services.

No pertinent information was provided in the database listing.
RWQCB Well Investigation Program (WIP)
Well Investigation program cases in the San Gabriel and San Fernando Valley areas.

According to the EDR report, United Concrete Pipe Corporation was identified as having a historical WIP case.
Air Resources Board Emissions (EMI)
Toxics and criteria pollutant emissions data collected by the Air Resources Board and local air pollution agencies.

According to the ED report, United Concrete Pipe Corporation was permitted by the South Coast Air Quality Management District (SCAQMD) to emit organic hydrocarbon gases, reactive organic gases, carbon monoxide, oxides of nitrogen and sulphur, and particulate matter in 1987.

4.3.2 Adjoining Properties

The following adjoining properties were identified on the databases in the EDR report:

- Elaine's Contracting at 14254 Arrow Highway (adjacent to the south of the Property) was identified on the following database:
  - **WIP** – According to the EDR report, the site had a historical WIP case.
- 14120 Live Oak Avenue (site name not listed; adjacent to the south of the Property) was identified on the following database:
  - **California Hazardous Material Incident Report System (CHMIRS)** - Database that contains information on reported hazardous material incidents, i.e., accidental releases or spills. The source is the California Office of Emergency Services. According to the EDR report, in July 2002 a 55-gallon drum of an unknown chemical was on its side and blocked a drain that ran to the street. The administration agency was listed as the Los Angeles County Fire Prevention. No other pertinent information was provided.
- Gumshoe Enterprises, Inc. at 14120 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:
  - **WIP** – According to the EDR report, the site had a historical WIP case.
- SVI International, Inc. at 14120 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:
  - **WIP** – According to the EDR report, the site had a historical WIP case.

- Time and Sound Co., Inc. at 14120 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  – **WIP** – According to the EDR report, the site had a historical WIP case.

- Toptek Technology, Inc. at 14140 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  – **WIP** – According to the EDR report, the site had a historical WIP case.

- K.S. Brother Box at 14140 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  – **WIP** – According to the EDR report, the site had a historical WIP case.

- Multi-Duti Manufacturing, Inc. at 14140 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  – **WIP** – According to the EDR report, the site had an "unidentified" and/or historical WIP case.

- Hydrodyne at 14140 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  – **WIP** – According to the EDR report, the site had a historical WIP case.

- L.A. Cellular at 14160 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  – **Facility and Manifest Data (HAZNET)** - Database of sites which submit a hazardous waste manifest to DTSC. According to the EDR report, the site reportedly disposed of alkaline solution and other inorganic solid waste to a recycler (or disposal method was not reported). The dates of the disposal(s) were not identified.

- Seizmic Inc. at 14160 and 14180 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  – **WIP** – According to the EDR report, the site had a historical WIP case.

- Sunburst Drapery Cleaners & Fireproofing at 14160 Live Oak Avenue (adjacent to the south of the Property) was identified on the following databases:

  – **HAZNET** – According to the EDR report, the site reportedly disposed of halogenated solvents to a recycler or transfer station. The dates of the disposal(s) were not identified.

- **DRYCLEANERS** – A list of drycleaner related facilities that have EPA ID numbers. According to the EDR report, the site was reported as a "drycelaning and laundry services (except coin-operated) in 1987, and inactive in 2005.
- **WIP** – According to the EDR report, the site had a "backlog" WIP case.
- **SLIC** – According to the EDR report, the site has an open SLIC case with the RWQCB as of 1996.

- Shelcomm at 14160 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  - **WIP** – According to the EDR report, the site had a historical WIP case.
  - **HAZNET** – According to the EDR report, the site reportedly disposed of laboratory waste chemicals and oxygenated solvents through a non-reported method. The dates of the disposal(s) were not identified.

- Times International Computers at 14160 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  - **WIP** – According to the EDR report, the site had a historical WIP case.

- Fuller & Associates at 14160 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  - **WIP** – According to the EDR report, the site had a historical WIP case.

- Hart Enterprises at 14160 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  - **WIP** – According to the EDR report, the site had a historical WIP case.

- Integrated Computer Service at 14180 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  - **WIP** – According to the EDR report, the site had a historical WIP case.

- J & B Refrigeration Inc. at 141680 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  - **WIP** – According to the EDR report, the site had a historical WIP case.

- Steno-Aide, Inc. at 14160 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  - **WIP** – According to the EDR report, the site had a historical WIP case.

- Cera, Inc. at 14180 Live Oak Avenue (adjacent to the south of the Property) was identified on the following database:

  - **WIP** – According to the EDR report, the site had a "not reported" WIP case.

- Hughes Markets (also identified as US Pipe & Foundry and Hughes Family Markets) at 14005 Live Oak Avenue (adjacent to the west of the Property) was identified on the following databases:

  - **Los Angeles County HMS** – Los Angeles County Industrial Waste and Underground Storage Tank Sites. According to the EDR report, the facility status was listed as "closed" and the permit status was listed as "removed".
  - **WIP** – According to the EDR report, the site had a "backlog" WIP case.
  - SLIC – According to the EDR report, the site has an open SLIC case with the RWQCB as of 1996.
  - **UST** – The site reportedly had three (3) fuel USTs in 1992.
  - **RCRA-SQG** – According to the EDR report, the site was reported as a small quantity generator with no violations reported.
  - **FINDS** - The pertinent environmental activity identified at this site is being identified on RCRAInfo (database).
  - **HAZNET** - According to the EDR report, the site reportedly disposed of aqueous solution with less than 10 percent total organic residues and halogenated solvents to a transfer station (or disposal method was not reported). The dates of the disposal(s) were not identified.

- Ray Gaskia (also listed as Chris Overton) at 14312 Arrow Highway (adjacent to the southeast of the Property) was identified on the following databases:

  - **WIP** – According to the EDR report, the site had a historical WIP case.
  - **UST** – The site reportedly had a 5,000-gallon fuel UST.
  - **HAZNET** - According to the EDR report, the site reportedly disposed of aqueous solution with less than 10 percent total organic residues to a transfer station. The dates of the disposal(s) were not identified.
  - **Los Angeles County HMS** – According to the EDR report, the facility status was listed as "removed" and the permit status was listed as "removed".

- Royal Oaks Body Shop at 14314 Arrow Highway (adjacent to the southeast of the Property) was identified on the following databases:

  - WIP – According to the EDR report, the site had a "not reported" WIP case.
  - **HAZNET** - According to the EDR report, the site reportedly disposed of halogenated solvents to a recycler. The dates of the disposal(s) were not identified.
  - **EMI** – According to the EDR report, the site was permitted by the SCAQMD to emit organic hydrocarbon gases and reactive organic gases in 1990.

The potential for environmental impact to the Property from these adjacent sites appears to be low due to one or more of the following: type of regulatory listing; location with respect to the direction of regional groundwater; distance from the Property; and status of the case (i.e., case closed).

4.3.3 Other Off-site Locations of Concern

Other off-site locations of concern identified by EDR within a maximum 1¼-mile radius from the Property included an Area of Concern (San Gabriel Valley; an area with known groundwater contamination), solid waste landfills, LUST sites, UST sites, WIP sites, LA County HMS sites, and HAZNET sites.

The potential for environmental impact to the Property from these off-site locations of concern appear to be low due to one or more of the following: type of regulatory listing; location with respect to the direction of regional groundwater; distance from the Property; and status of the case (i.e., case closed).

4.3.4 Orphan Listings

The EDR database report identified numerous orphan listings. The locations of these sites appeared to be in the general vicinity of the Property (primarily along Arrow Highway and Live Oak Avenue in the City of Irwindale); however, due to distance and/or type of listing these sites were determined to have a low environmental concern to the Property.

4.4 Additional Environmental Record Sources

4.4.1 California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC)

Converse reviewed available records provided by the DTSC, Chatsworth office.

According to the records, it appeared that in June 1990 the United Concrete Pipe site (of which the Property is a part) had a Preliminary Endangerment Assessment (PEA) prepared for the California Department of Health Services (DHS) by Woodward-Clyde Consultants, as United Concrete Pipe was reportedly closing.

As a part of the oversight, DHS conducted an Abandoned Site Program Drive-By Record (site inspection). The DHS notes on a United Concrete Pipe facility map indicated that the following United Concrete facility features were located on the Property: a portion of a personnel office, the main shop building, a craneway, “s/c plant”, ring plant, boiler room, two (2) cesspools, two (2) curing docks, a centrifugal, water well and pump, and an office building.

Depth to water was reportedly at 170 feet below ground surface during the PEA.

According to the PEA, United Concrete Pipe had operated since 1936 and manufactured concrete pipes. The report indicated that in the centrifugal plant (historically on the north-central portion of the Property), paraffin wax was utilized to form concrete pipe molds. Residual wax that had been steam cleaned discharged into two (2) clarifiers, which emptied to a settling pond (west side of the facility; i.e., not the Property).

The report identified areas of potential environmental concern associated with United Concrete Pipe, including:

- Several USTs had been removed or were present during the PEA (reportedly up to nine (9) USTs at the facility);
- A waste oil sump with known soil contamination;
- Significant surfical oil staining;
- Large stained area under rail equipment (also from rail crane maintenance);
- 55-gallon drum of unknown content;
- Possible solvent use at engine steam-cleaning area;
- Several drums of WRDA-19 superplasticizer;
- 1 to 5-gallon drums of open paints and solvents;
- Electrical transformers containing PCBs (labeled, diked, and fenced);
- 55-gallon drums labeled McGean-Rohco (finish oil);
- 55-gallon drum for dispensing thinner;
- Water draining from back wall of ring plant, possibly from metal cutting processes;
- One (1) 8,000-gallon and two (2) 10,000-gallon tanks excavated and removed “from this area”;
- Settling pond;
- Paraffin collecting areas;
- Hydraulic fluid around stripper tracks;
- An open 20-gallon drum of week killer;
- An electrical transformer in basement crawlspace and possiblely PCB-containing.

Based on the map and descriptions by Woodward-Clyde Consultants, it appears that the concerns related to water draining from the ring plant, the previously excavated 8,000-gallon and two (2) 10,000-gallon tanks, and paraffin collecting areas were located on the Property, near the centrifugal area (north-central portion of the Property). The UST records reviewed by Woodward-Clyde and included as an appendix to the PEA indicated that the 8,000-gallon and two (2) 10,000-gallon diesel fuel USTs were removed

in October 1987 (Western Environmental Services, Inc.). The USTs were located west of the centrifugal building. Sample results indicated the maximum concentration of petroleum hydrocarbons detected was 140 mg/kg. Based on the report, the DPW issued closure with no further action required. The other UST records in the PEA report appeared to be related to USTs at the remainder of the United Concrete Pipe facility (i.e., not on the Property).

The report indicated that Woodward-Clyde had previously, as well as for the PEA, conducted trenching and soil and water sampling onsite (site screening). Sampling activities pertaining to the Property area of United Concrete Pipe included trenching and soil sampling at the centrifugal line (north-central portion of the Property), reportedly the oldest part of the facility, and with visible surficial staining. Woodward-Clyde indicated that visible staining appeared to be confined to the top 8 to 10 inches of soil and was hydrocarbon staining from wax or form oil (sample Q2 at 1-foot reported the maximum concentration of 1,100 milligrams per kilogram of petroleum hydrocarbons). Woodward-Clyde indicated that no evidence of volatile organic compounds (VOCs) was uncovered during the field work, when the use of an organic vapor analyzer was used during onsite soil screening.

Water samples collected by Woodward-Clyde from one of two cesspools on the Property (i.e., cesspools 4 and 6, the western portion of the Property) indicated that cesspool 4 was non-detect for VOCs.

In addition, Woodward-Clyde collected soil samples at the transformer area of the facility (north-central portion of the Property), where PCBs were not detected in soil samples, and no visible staining was observed.

Woodward-Clyde concluded that the petroleum hydrocarbons detected at the United Concrete Pipe facility (including the Property) were low, with the exception of the “pour line” (i.e., offsite).

After a DHS response to the completed PEA and subsequent Woodward-Clyde response to the DHS’s comments, the DHS issued a letter indicated that the site does not appear to pose a significant threat to public health or the environment, and indicated that the proposed demolition and development of the United Concrete Pipe facility (including the Property and the already developed west adjacent property as a commercial building and parking) would adequately mitigate hazards associated with the settling ponds, cesspools, and USTs. The DHS indicated that this does not preclude the state from requiring additional investigation for remediation measures for contaminants found to exist at the site and surrounding properties to protect public health or the environment.

Select copies of records pertaining to the Property are provided in Appendix F.

4.4.2 Cal/EPA, Los Angeles Regional Water Quality Control Board (RWQCB)

According to the RWQCB, records with the Site Cleanup (SLIC 1 Unit) exist for United Concrete Pipe but could not be located; however, the UST and SLIC 2 (former Well Investigation [WIP]) units provided records for review.

UST Unit

The UST records on file with RWQCB appeared to be similar to the records summarized in the Woodward-Clyde PEA (see Section 4.4.1), or were not the pertaining to the Property.

However, a May 25, 2000 RWQCB letter to Wohl Property Group indicated that the previous UST removals and closures at the United Concrete Pipe facility did not include testing for methyl tertiary butyl ether (MTBE). The RWQCB requested that such soil testing be conducted; however, records of such testing were not found in the file. The May 23, 2000 RWQCB letter is provided in Appendix G.

SLIC 2 Unit

A 1989 Well Investigation Program – Mandatory Chemical Use Questionnaire completed by United Concrete Pipe indicated numerous hazardous chemicals and gases, were stored/utilized onsite, including diesel and gasoline fuel, oils, napthenes, acetyne, acetylene, argon, carbon dioxide, nitrogen, oxygen, electrical transformers filled with PCB-containing oil, paints, epoxy resin, and coal tar.

Other records appeared to pertain to the remainder of the United Concrete facility (i.e., offsite) and included the removal of contaminated soils.

4.4.3 California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR)

Wildcat Map W1-5, Los Angeles and Orange Counties, draft June 29, 2006 was reviewed online. No oil or gas wells are located on the Property or adjacent properties.

4.4.4 California Department of Forestry and Fire Protection (CDP), Office of State Fire Marshall (OSFM), Pipeline Safety Division

According to the OSFM, no pipelines jurisdictional to the OSFM are located in the Property vicinity.

4.4.5 South Coast Air Quality Management District (SCAQMD)

The SCAQMD provided available records for United Concrete Corp. at 14041 Live Oak Avenue (of which the Property was a part). According to the records, United Concrete Corp. was permitted in 1974 to operate a concrete batching plant with bucket elevator, sand storage bins, sand weigh hopper, cement weigh hopper, two belt conveyors, two batch receiving hoppers and two pug mill mixers. In addition, the site was permitted to operate as a gasoline fueling facility with two (2) nozzles in 1982.

Also provided by SQAQMD were Notices to Comply/Notices of Violations. In 1985 a complaint of visible emissions was made against United Concrete Corp, and in 1990, a complaint of demolition where clouds of dust were observed 75 to 100 feet in the air with possible airborne asbestos was made.

An additional Notice to Comply indicated that permit fees and an annual emission report were due in 1992. The outcome of these issues was not summarized in the SCAQMD records.

4.4.6 Los Angeles County, Department of Health Services (DHS), Public Health Investigation

No information regarding the Property was on file with DHS.

4.4.7 Los Angeles County, Department of Public Works (DPW), Environmental Programs

There is no information regarding the Property on file with DPW.

4.4.8 County Sanitation Districts of Los Angeles County (CSDLAC)

According to the CSDLAC, the United Concrete Facility (of which the Property was a part) has not been connected to the CSDLAC sewer since at least 1982. No other records were provided by the CSDLAC and the CSDLAC referred Converse to DPW.

5.0 Property Reconnaissance

5.1 Methodology

On June 16, 2008 Converse visited the Property to determine present use and to identify environmental conditions at the Property. Our methodology involved walking the exterior areas of the Property while noting observed evidence of present and potential environmental concerns.

A field-generated map is provided in Appendix A. Pertinent Property photographs are provided in Appendix B.

5.2 Limiting Conditions

Converse's findings are based on the Property conditions observed on Tuesday, June 16, 2008.

5.3 Exterior Observations of Property

During our Property visit, Converse made the following observations of the exterior of the Property:

Table 3 – Exterior Observations of Property

Item or Condition	Observed Evidence	No Evidence Observed	Comments
Hazardous Substances & Petroleum Products:	☐	☒	
Storage Tanks & Related Equipment:	☒	☐	An approximate 10,000-gallon aboveground storage tank and associated pump were observed on the south-central portion of Property. No leaks, stains, or odors were observed or detected in the vicinity of these features.
Odors:	☐	☒	
Standing Surface Water or Other Pools of Liquid:	☐	☒	
Drums & Other Containers of Hazardous Substances, Petroleum	☐	☒	

Table 3 – Exterior Observations of Property

Item or Condition	Observed Evidence	No Evidence Observed	Comments
Products, or Other Unidentified Contents:			
Transformers or Equipment containing Polychlorinated Biphenyls (PCBs):	☐	☒	
Pits, Ponds, or Lagoons:	☐	☒	
Stained Soil or Pavement:	☐	☒	
Stressed Vegetation (other than from insufficient water):	☐	☒	
Evidence of Mounds, Depressions or Filled or Graded Areas Suggesting Trash or Other Solid Waste Disposal:	☐	☒	
Waste Water or any discharge (including storm water) into a Drain, Ditch, or Stream on or Adjacent to the Property:	☐	☒	
Wells (active, inactive, or abandoned):	☐	☒	
Septic Systems or Cesspools:	☐	☒	Although not observed, historically cesspools and septic tank systems have been installed as a part of the United Concrete Pipe Corp. facility.
Prior Structures:	☒	☐	Concrete pads were observed on the eastern portion of the Property. It was not apparent if these pads were from previous structures or equipment. In addition, several piles of concrete debris and roofing materials were observed on the southern portions of the Property.
Roads, Tracks, Railroad Tracks or Spurs:	☒	☐	An unimproved driveway provides access to the southwestern portion of the Property off Live Oak Avenue.

In addition to the above, the following were observed:

- A Los Angeles Department of Water and Power easement (powerlines) and concrete enclosure with electrical meters was observed on the southern portion of Property.

- A wooden pole (potential former electrical pole) was observed on the central portion of the Property.

- In addition to the concrete and roofing materials piles, minor trash and debris including trash cans full of sand, metal and plastic piping, and rubber hosing was observed onsite. No leaks, stains, or odors were observed or detected in the vicinity of the trash and debris observed.

5.4 Current Uses of Adjoining Properties

Based on our research and observations during our Property visit, the Property is bordered by the following:

Table 4 – Adjoining Property Use

Direction	Current Development
North:	Arrow Highway, followed by the Santa Fe Flood Control Basin.
Northeast:	Arrow Highway, followed by landscaping and a part of Norman's Nursery (open, potted plant storage), then the Santa Fe Flood Control Basin.
Northwest:	Asphalt-paved truck parking
South:	Live Oak Avenue, followed by (from west to east): • 14020 Live Oak Avenue; unknown office/warehouse facility; • 14120, 14140, 14160, and 14180 Live Oak Avenue; various commercial/industrial properties that are a part of Live Oak Commerce Center (several of which were identified in databases in the EDR report); • Two (2) large aboveground water storage tanks and Valley County Water District facility; • 14254 Live Oak Avenue; K.J. Patteson Inc. (unknown commercial/industrial facility).
Southeast:	The intersection of Live Oak Avenue and Arrow Highway, followed by 14314 Live Oak Avenue; Royal Oaks Paint and Body. The address of 14312 Live Oak Avenue was reported in the EDR report; however, this facility was not readily visible during the Property reconnaissance.
Southwest:	Live Oak Avenue, followed by 14010 Live Oak Avenue (unknown office/warehouse facility).
East:	Landscaping and the intersection of Live Oak Avenue and Arrow Highway.
West:	14005 Live Oak Avenue (unknown multi-story office building)

5.5 Current Uses of Surrounding Area

Based on our research and observations during our Property visit, the surrounding area of the Property consists of a mix of residential, commercial and industrial properties. Several adjacent properties to the south, southeast, and west of the Property were identified on databases in the EDR report.

6.0 Interviews

During the interviews, the owners and occupants were asked if they had any available documents that would be helpful. The documents that were requested are detailed in Section 3.1 of this report.

6.1 Property Owner

Access to interview a Property owner representative was not provided by the Client, the City of Irwindale.

6.2 Tenant/Occupant

The site is currently unoccupied; therefore, no interviews of tenants/occupants could be conducted.

6.3 State or Local Government Officials

Other than the information provided in Section 4.4, no further information could be obtained within the timeframe of this assessment.

7.0 Findings

A cursory summary of findings is provided below. However, details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein.

- The Property appeared to be undeveloped land as early as 1928-29. By 1936, the Property appeared to be developed as a portion of a larger industrial facility (United Concrete Pipe Corp.). A 1987 Preliminary Foundation Investigation, as well as a 1990 demolition permit, provided a map of the United Concrete Pipe Corp, depicting a main shop building, a personnel office, water well and pump, office building, craneway, ring plant, batch plant, boiler room, and centrifugal located onsite, with the remainder of the United Concrete Pipe Corp. facility to the west. The Property appears to have remained largely vacant since 1991.

- United Concrete Pipe Corp. at 14041 Live Oak Avenue (of which the Property was a part) was identified on several databases, including the ENVIROSTOR database, where in 1990 “No Further Action” was reported by the DTSC. In addition, United Concrete Pipe Corp. reportedly had seven (7) USTs installed onsite in 1974, and an “Open” SLIC case as of 1965 was identified under Koll Business.

- Several adjoining properties to the south, southeast, and west were identified in databases in the EDR report, primarily on the WIP database, where a historical WIP case was identified.

- According to agency records, a 8,000-gallon and two (2) 10,000-gallon tanks near the centrifugal area (north-central portion of the Property) were removed in October 1987. Sample results indicated the maximum concentration of petroleum hydrocarbons detected was 140 mg/kg. Based on the report, the DPW issued closure with no further action required. However, a May 25, 2000 RWQCB letter to Wohl Property Group indicated that the previous UST removals and closures at the United Concrete Pipe facility did not include testing for methyl tertiary butyl ether (MTBE). Records of such testing were not found in the RWQCB file or any other agency records. In addition, sampling activities pertaining to the Property area of United Concrete Pipe (prior and for the PEA) did not include the laboratory analysis for VOCs in soil or any soil vapor assessment.

- During the Property reconnaissance, Converse observed the following:

  - An approximate 10,000-gallon aboveground storage tank and associated pump on the south-central portion of Property.
  - Concrete pads on the eastern portion of the Property. It was not apparent if these pads were from previous structures or equipment.
  - Several piles of concrete debris and roofing materials on the southern portions of the Property. In addition to the concrete and roofing materials piles, minor trash and

debris including trash cans full of sand, metal and plastic piping, and rubber hosing was observed onsite. No leaks, stains, or odors were observed or detected in the vicinity of the trash and debris observed.

- A Los Angeles Department of Water and Power easement (powerlines) and concrete enclosure with electrical meters on the southern portion of Property.

8.0 Opinion

- The historic industrial use of the Property including manufacturing, the use of USTs, an AST, and cesspools onsite are Recognized Environmental Conditions (RECs). It appears that issues relating to the Property regarding the former USTs, cesspools, transformers and surficial staining had been previously addressed with the exception of soil sampling for MTBE at the areas of the former USTs and soil vapor sampling onsite.

- The historic and current use of industrial properties that adjoin the Property is considered an REC due to the potential for offsite, subsurface contamination.

- The trash and debris observed onsite (excluding suspect roofing materials) is not considered an REC. All trash and debris onsite should be disposed of according to all applicable regulations.

- The location of an electrical easement onsite is not considered an REC. No further assessment regarding all electrical-related features onsite is warranted at this time.

9.0 Conclusions and Recommendations

Converse has performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM Practice E1527-05 for a 17 acre lot located at Live Oak Avenue and Arrow Highway (Los Angeles County Assessor's Parcel Number [APN] 8535-001-911), in the City of Irwindale, County of Los Angeles, California. Any exceptions to or deletions from this practice are described in the Limitations and Exceptions of Assessment section of this report. This assessment has revealed no evidence of *recognized environmental conditions* in connection with the *Property*, except for the following:

- The historic industrial use of the Property including manufacturing, the use of USTs, an AST, and cesspools;
- The historic and current use of industrial properties that adjoin the Property.
- Roofing material debris.

Based on the findings of this Phase I ESA, further assessment appears warranted at this time, including, but not limited to, the following:

- Phase II assessment activities to assess historic features associated with the former United Concrete Pipe Corp. facility. The Phase II activities should include soil sampling at a minimum for MTBE, and a soil vapor survey.
- Roofing debris material should be analyzed for asbestos prior to disposal.
- All trash and debris, including the AST, located on the Property will need to be disposed of appropriately.

10.0 Deviations and Limitations

No deviations or limitations from the ASTM Standard Practice occurred during this assessment:

11.0 Additional Non-Scope Services

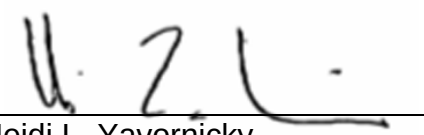
There are environmental issues outside the scope of the ASTM E1527-05 that can be assessed in connection with a commercial real estate transaction. These are dealt with as non-scope considerations since they do not typically present a Superfund Liability. The specific level of inquiry (if any) is defined in the Proposal which contains a Scope of Work. These non-scope services are very client specific and not covered by the ASTM standard. They are frequently related to the business environmental risk which is defined in the standard as "risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate…"

No non-scope issues were addressed in this report.

12.0 Signature of Environmental Professional

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312.

I have the specific qualifications based on education, training and experience to assess a *property* of the nature, history, and setting of the *subject property*. I have developed and performed the all appropriate inquiries in conformance with the standard and practices set forth in 40 CFR Part 312.



Heidi L. Yavornicky
Senior Staff Environmental Scientist

This Phase I ESA was completed by the above Environmental Professional. A complete list of preparers, and their responsibilities for this assessment, is provided in the following section (Section 13.0, List of Preparers).

13.0 List of Preparers

Laura Tanaka
Principal Environmental Scientist

B.S., Biology, California State Polytechnic University, Pomona, 1987
Cal/EPA Registered Environmental Assessor, #06283
Cal-OSHA Site Surveillance Technician, #94-1388
DHS Certified Lead Inspector/Assessor, #I-3086
DHS Certified Project Designer, #D-3086
DHS Certified Project Monitor, #M-3086

Manager of the Phase I Environmental Site Assessment department of the Costa Mesa office. Ms. Tanaka has 17 years experience with Phase I and II ESAs, Preliminary Endangerment Assessments, asbestos surveys, lead-based paint surveys, abatement monitoring, as well as hazardous material audits, completing business plans, and SCAQMD permitting. Current duties at CONVERSE include project management, business development and client maintenance, conducting/managing ESAs, and completing third party documents reviews.

Principal area of responsibility for this ESA report: Project Management, Client Point of Contact, Historical Research, Report Generation, and Report Review.

Heidi L. Yavornicky
Senior Staff Environmental Scientist

B.A., Environmental Studies, Minor Concentration Geography, California State University San Bernardino, San Bernardino, 2002
Cal-EPA Registered Environmental Assessor, #30063
Passed Cal-OSHA Certified Asbestos Site Surveillance Technician Exam
40-Hour OSHA Health and Safety Training for Hazardous Waste Workers
24-Hour OSHA First Responder – Operations Level

Mrs. Yavornicky has 5 years of environmental experience. Mrs. Yavornicky has conducted Phase I and II Environmental Site Assessments and Transaction Screen Process Reports on undeveloped land to industrial facilities throughout northern and southern California, as well as in Nevada, Arizona, Oregon, and Washington. In addition, Mrs. Yavornicky has supervised various hazardous waste remediation projects.

Principal area of responsibility for this ESA report: Property reconnaissance, Historical Research, Regulatory Agency Interaction, Interviews, Report Generation, and Report Review.

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14.0 References

California Department of Conservation, Division of Mines and Geology, Geologic Map of California, 1991.

California Department of Conservation, Division of Oil and Gas, Regional Wildcat Map W1-5, Los Angeles and Orange Counties, draft dated June 29, 2006, reviewed online June 2009.

County Sanitation Districts of Los Angeles County, Information Request, June 2009.

Environmental Data Resources (EDR), Inc., EDR-City Directory Abstract, June 2009.

Environmental Data Resources (EDR), Inc., EDR-Radius Map Report, June 2009.

Environmental Data Resources (EDR), Inc., Request for Sanborn Maps, June 2009.

Fairchild Aerial Photograph Collection, Whittier College, Aerial Photograph Review, June 2009.

Irwindale, City of, Building and Safety Department, Building Permit Review, July 2009.

Irwindale, City of, Planning Department, Zoning Review and Planning Documents Review, June and July 2009.

Los Angeles County, Department of Health Services, Public Health Investigation, Request for Information, June 2009.

Los Angeles County, Department of Public Works, Environmental Programs, Groundwater Wells Website, accessed online June 2009.

Los Angeles County, Department of Public Works, San Gabriel Valley Groundwater Contour Map, Fall 1997.

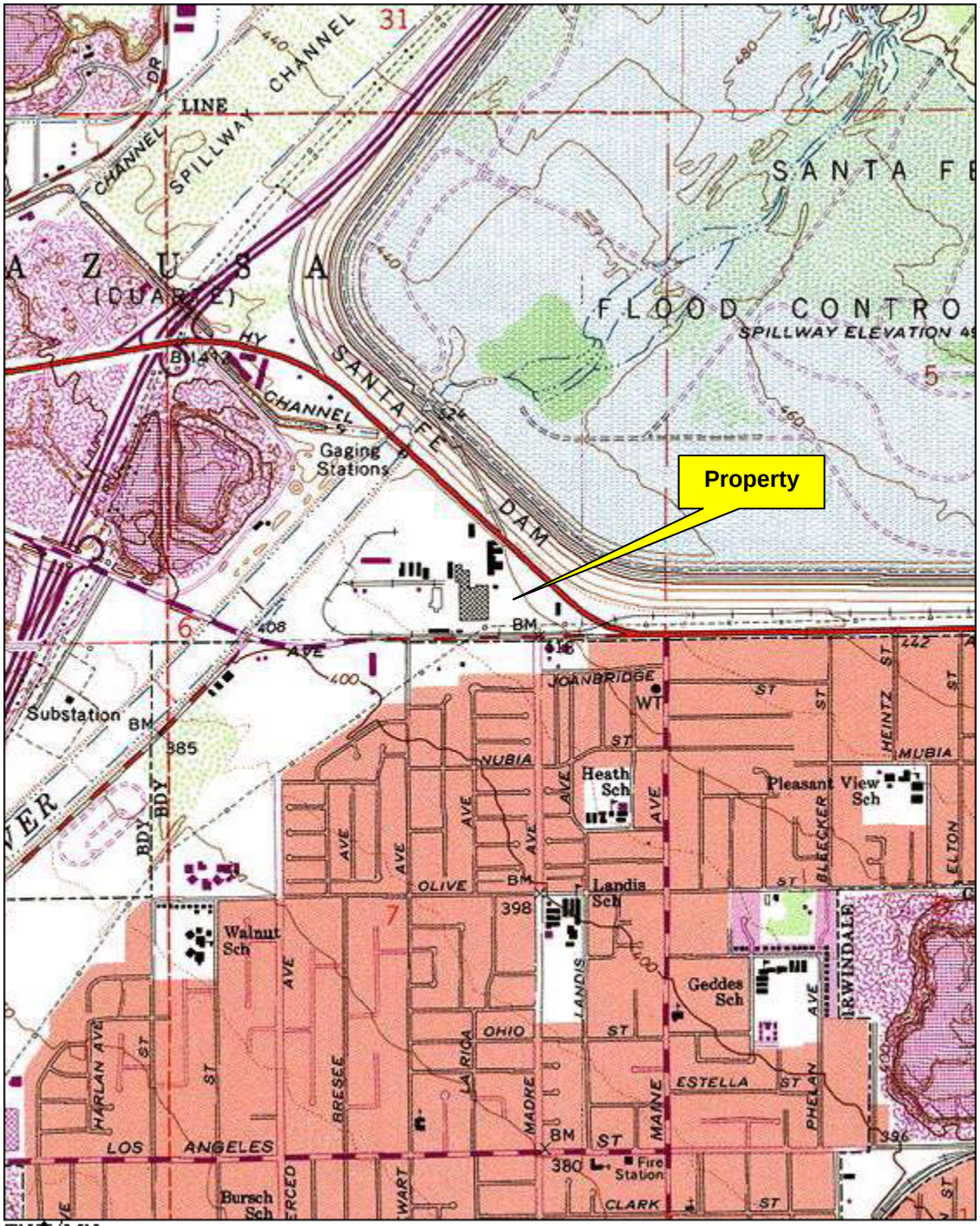
Los Angeles Regional Water Quality Control Board, Request for Information, June 2009.

South Coast Air Quality Management District, Request for Information, June 2009.

United States Geological Survey, 7.5-Minute Topographic Quadrangle, Baldwin Park, 1953, 1966 photorevised 1977, and 1981.

Property Plans

Appendix A



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

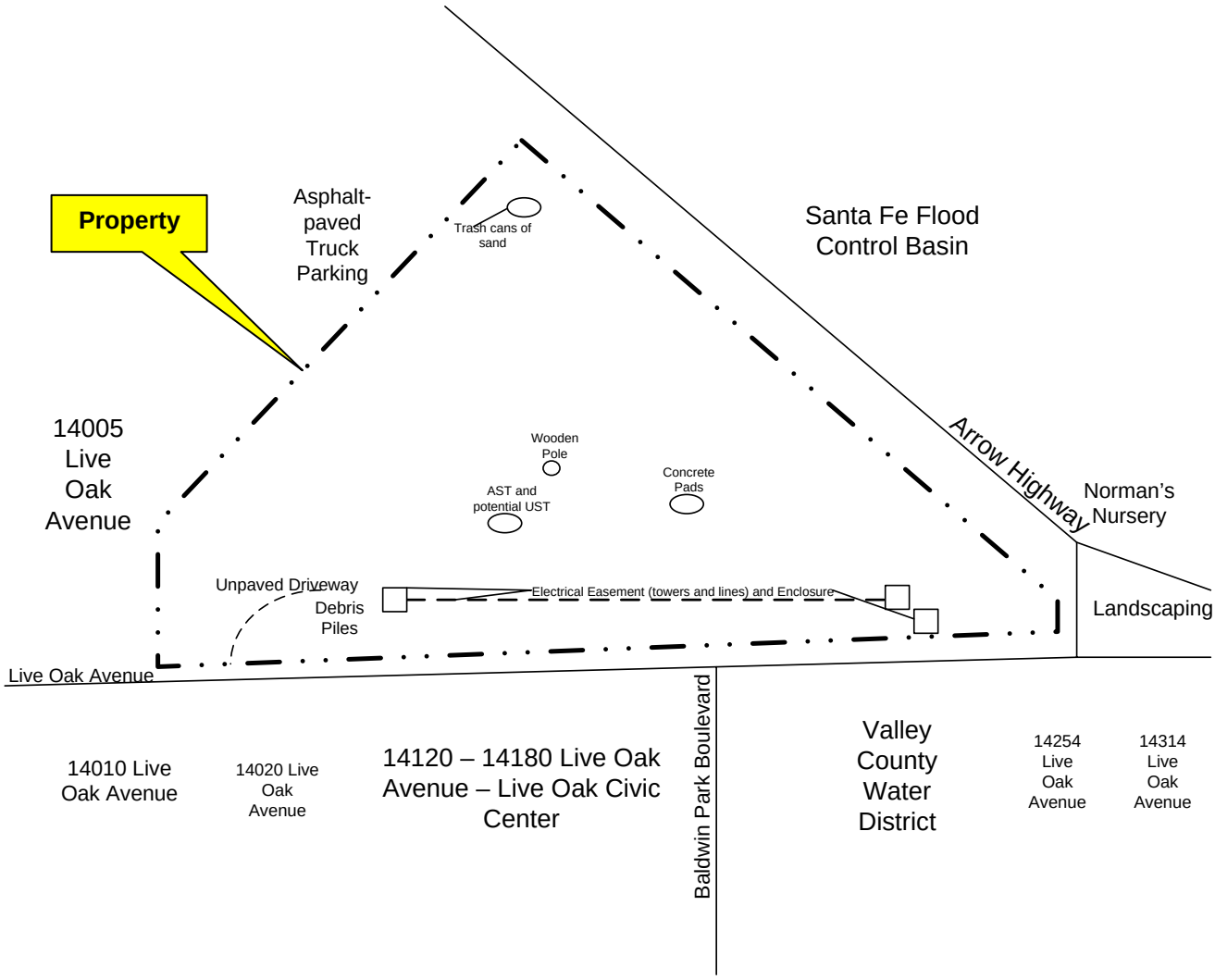
Area Map

Client: City of Irwindale
Approximate 17 Acre Lot, Irwindale, California

Project No:
09-42-138-01

Converse Consultants

FIGURE **1**



Property Plan

Client: City of Irwindale
Approximate 17 Acre Lot, Irwindale, California

Project No: 09-42-138-01

Converse Consultants

FIGURE **2**

Pertinent Property Photographs

Appendix B



Picture 1: View northeast from southwestern portion of Property.



Picture 2: View southeast from northern tip of Property.

Property Photographs



Picture 3: View of AST and potential UST on the south-central portion of the Property.



Picture 4: View of wooden pole on the central portion of the Property.

Property Photographs



Picture 5: View of concrete pads on the eastern portion of the Property.



Picture 6: View of concrete and roofing materials debris on the southern portion of the Property.

Property Photographs



Picture 7: View of Los Angeles Department of Water and Power concrete enclosure for electrical meters on the southern portion of the Property.



Picture 8: View of Los Angeles Department of Water and Power easement (towers and lines) on the southern portion of the Property.

Property Photographs

EDR-Environmental
Lien Search Report

Appendix C

The EDR Environmental LienSearch™ Report

17.5 ACRE VACANT LOT
LOS ANGELES COUNTY
IRWINDALE, CA 91706

Project Number 02516447.5

June 22, 2009

The Standard in Environmental Risk Information

440 Wheelers Farm Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

EDR Environmental LienSearch™ Report

The EDR Environmental LienSearch Report includes results from a search of available current land title records for environmental cleanup liens and other activity and use limitations, such as engineering controls and institutional controls.

A network of professional, trained researchers follows established procedures to:

- search for parcel information, legal description, and ownership based on client supplied address information;
- research indexes and title repositories;
- obtain a copy of the deed;
- search for environmental encumbering instrument(s) associated with the deed;
- provide a copy of any environmental encumbrance(s) based upon a review of key words in the instrument (title, parties involved, and description); and
- provide a copy of the deed.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EDR Environmental LienSearch™ Report

TARGET PROPERTY INFORMATION

ADDRESS

17.5 ACRE VACANT LOT
LIVE OAK AVENUE
IRWINDALE, CA 91706

RESEARCH SOURCE

Sources: Los Angeles County

DEED INFORMATION

Type of Deed: WD ☐ QCD ☒ Other ☐ DEED

Title is vested in: Irwindale Community Redevelopment Agency

Title received from: Comcast MO Financial Services, Inc, successor to U. S. West Financial Services, Inc.

Deed Dated: March 3, 2005
Deed Recorded: April 20, 2005
Document No.: 05-0911595

LEGAL DESCRIPTION

Description: Legal attached as Exhibit "A."

Assessor's Parcel Number:8535-001-911

ENVIRONMENTAL LIEN

Environmental Lien: Found ☐ Not Found ☒

If yes:

1st Party:

2nd Party:

Dated:
Recorded:
Book:
Page:
Comments:

OTHER ACTIVITY AND USE LIMITATIONS (AULs)

Other AUL's: Found ☐ Not Found ☒

NOTE: Revised Statement of Proceedings recorded July 16, 2007 as Document No. 20071677750 and is attached as Exhibit "B."

EDR Environmental LienSearch™ Report

EXHIBIT A

EXHIBIT A

This page is part of your document - DO NOT DISCARD

05 0911595

RECORDED/FILED IN OFFICIAL RECORDS
RECORDER'S OFFICE
LOS ANGELES COUNTY
CALIFORNIA

8:04 AM APR 20 2005

TITLE(S) : DEED



FEE

FREE 2 KK

D.T.T.

CODE
20

CODE
19

CODE
9___

Assessor's Identification Number (AIN)
To be completed by Examiner OR Title Company in black ink.

Number of AIN's Shown

N F

THIS FORM IS NOT TO BE DUPLICATED

2

RECORDING REQUESTED BY

05 0911595

WHEN RECORDED MAIL TO
AND MAIL TAX STATEMENTS TO

NAME Irwindale Community Redevelopment Agency
ATTN: Linda J. Kimbro, CMC
ADDRESS 5050 N Irwindale Avenue
CITY Irwindale, CA 91706
STATE & ZIP

TITLE ORDER NO. ESCROW OR LOAN NO. APN NO.

QUITCLAIM DEED

THE UNDERSIGNED GRANTOR(s) DECLARE(s)
DOCUMENTARY TRANSFER TAX is $_____ CITY TAX $_____
☐ computed on full value of property conveyed, or ☐ computed on full value less value of liens or encumbrances remaining at time of sale,
☐ Unincorporated area: ☒ Irwindale Community Redevelopment Agency, and

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, Comcast MO Financial Servcies, Inc successor to U.S. West Financial Services, Inc. lien hold interest

hereby remise, release and forever quitclaim to the Irwindale Community Redevelopment Agency

the following described real property in the County of Los Angeles , State of California:

Parcel 2 of Parcel Map No. 22152, in the City of Irwindale, County of Los Angeles, State of California as shown on Map filed Book 231, pages 15 through 18, inclusive of Parcel Maps, in the office of the County Recorder of the County of Los Angeles.

Comcast MO Financial Services, Inc.,
successor to U.S. West Financial Services,
Inc. lien hold interest

Dated March 3, 2005

By: _____
Arthur R. Block, Senior Vice President

STATE OF ~~CALIFORNIA~~ Pennsylvania
COUNTY OF Philadelphia) S.S.

On March 3, 2005 before me, D. Leah MERONE
(here insert name and title of the officer), personally appeared Arthur R. Block, Senior Vice President

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Signature _____

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
D. LEAH MERONE, Notary Public
City of Philadelphia, Phila. County
My Commission Expires March 28, 2005

3

05 0911595

IRWINDALE

REDEVELOPMENT AGENCY

CERTIFICATE OF ACCEPTANCE

This is to certify that the interest in real property conveyed by the Quitclaim Deed dated **March 3, 2005** from **Comcast MO Financial Services, Inc., successor to U.S. West Financial Services, Inc. lien hold interest** to the **Irwindale Community Redevelopment Agency**, a public body, corporate and politic is hereby accepted by the undersigned officer or agent on behalf of the Irwindale Community Redevelopment Agency pursuant to authority conferred by Resolution No. CR (I) 90-236 of the Irwindale Community Redevelopment Agency adopted on April 26, 1990 and the grantee consents to recordation thereof by its duly authorized officer.

Dated: April 4, 2005 By: _____
Steve Biancarte, Executive Director

5050 North Irwindale Ave. Irwindale, CA 91706 (626) 430-2200 Facsimile: (626) 962-2018

EXHIBIT B

This page is part of your document - DO NOT DISCARD

20071677750 Pages: 012

Recorded/Filed in Official Records
Recorder's Office, Los Angeles County,
California

07/16/07 AT 10:40AM

Fee: 0.00
Tax: 0.00
Other: 0.00
Total: 0.00

905640 200707160890014 Mail

TITLE(S) :

LEAD SHEET

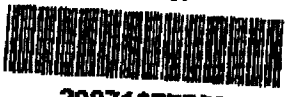
Assessor's Identification Number (AIN)
To be completed by Examiner OR Title Company in black ink. Number of AIN's Shown

THIS FORM IS NOT TO BE DUPLICATED

Recorded at the request of
Irwindale Community
Redevelopment Agency, a
public body corporate and
politic

When Recorded Mail to:
City of Irwindale
5050 N. Irwindale Ave.
Irwindale, CA 91706

07/16/07



20071677750

Exempt From Recording Fee Pursuant To Gov't Code § 6103 And From Payment Of Documentary Transfer Tax Pursuant To Revenue And Taxation Code §11922

THE PROPERTY THAT IS THE SUBJECT OF THIS STATEMENT IS LOCATED WITHIN A REDEVELOPMENT PROJECT

REVISED STATEMENT OF PROCEEDINGS
(Recorded pursuant to Government Code section 27295 and Health and Safety Code section 33373)

On July 19, 1974, the City of Irwindale (the "City") and the Irwindale Community Redevelopment Agency (the "Agency") instituted proceedings for the redevelopment of the land, described in Exhibit A attached hereto and incorporated hereby by this reference (the "Project Area"). Those proceedings were instituted pursuant to the Community Redevelopment Law, Health & Safety Code Sections 33000 *et seq.* ("CRL"), and the Redevelopment Plan for the Project Area (the "Redevelopment Plan") and by the adoption of City Ordinance No. 302 on July 19, 1976, approving and adopting the amended Irwindale Redevelopment Plan for the City Industrial Development Project Area, which Redevelopment Plan was subsequently amended by Ordinance No. 316, adopted on August 26, 1977; by Ordinance No. 336, adopted on February 14, 1980; by Ordinance No. 411, adopted on December 18,1986; by Ordinance No. 492, adopted on December 15, 1994; by Ordinance No. 554, adopted on June 28, 2001; by Ordinance No. 556, adopted on October 10, 2002; and by Ordinance No. 578, adopted on December 16, 2003.

The provisions of the Redevelopment Plan authorize the use of the power of eminent domain by the Agency to acquire any interest in real property in the Project Area, which cannot be acquired by gift, devise, exchange, purchase, or any other lawful method in order to eradicate blighting influences within the Project Area and to redevelop land to uses consistent with the environmental, economic, and social goals of the community. The Agency proposes to eliminate and prevent the continued spread of physical and economic blight in the Project Area by:

(1) Encouraging owner participation agreements between the Agency and major landowners within the Project Area to facilitate development of completed sites in particular, to more beneficial and economic land uses;

(2) Acquisition of real property as may be necessary to achieve the objectives of the Redevelopment Plan;

(3) Demolition or removal of buildings and improvements as may be necessary to achieve the objectives of the Redevelopment Plan;

(4) Installation, construction or reconstruction of streets, utilities, and other public improvements;

(5) Disposition of any property acquired for uses in accordance with the Redevelopment Plan;

(6) Redevelopment of land by private enterprise and/or public agencies for uses in accordance with the Redevelopment Plan.

(7) To act in accordance with any purpose allowed pursuant to the CRL.

The use of the power of eminent domain is limited by the CRL, by Sections 303, 305 and 309 of the Redevelopment Plan and by the Agency's program to acquire real property by eminent domain as set forth in Ordinance No 554, adopted by the City Council on June 28, 2001. The applicable limitations are as follows:

1. The Agency shall comply with all applicable laws in acquiring real property by eminent domain.

2. The Agency shall not have the power of eminent domain with respect to any parcel that is improved with structures currently and actually occupied with residential uses nor residentially zoned properties.

3. The Agency shall not commence any eminent domain proceedings to acquire any real property after June 28, 2013. This limitation shall not apply to any proceeding filed by the City for a public purpose.

4. The Agency shall not acquire real property to be retained by an owner pursuant to a participation agreement if the owner fully performs under the agreement.

5. The Agency shall not acquire any real property on which an existing building is to be continued on its present site and in its present form and use without the consent of the owner, unless: (i) such building requires structural alteration, improvement, modernization or rehabilitation; or (ii) the site or lot on which the building is situated requires modification in size, shape, or use; or (iii) it is necessary to impose upon such property any of the standards, restrictions, and controls of the Redevelopment Plan and the owner fails or refuses to participate in the Redevelopment Plan by executing a participation agreement.

6. The Agency, by law, is not necessarily authorized to acquire property devoted to a public use without the consent of the applicable public body. The Agency, however, will seek the cooperation of all public bodies which own or intend to

acquire property in the Project Area. Any public body, which owns or leases property in the Project Area, will be afforded all the privileges or owner participation if such public body is willing to enter into a participation agreement with the Agency. The Agency is authorized to financially (and otherwise) assist any public entity in the cost of public land, buildings, facilities, structures, or other improvements (within or outside of the Project Area) which land, buildings, facilities structures or other improvements are of benefit to the Project.

7. The Agency is authorized to acquire structures without acquiring the land upon which those structures are located.

8. The Agency is authorized to acquire any other interest in real property less than a fee interest.

The foregoing constitutes the Revised Statement of Proceedings in accordance with the CRL.

Dated this 25th day of June, 2007.

CITY OF IRWINDALE

By: _____
Robert Griego, Interim City Clerk

5

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California
County of Los Angeles } ss

On June 25, 2007 (Date) before me, Armando Heggdahl, Notary Public (Name and Title of Officer (e.g. "Jane Doe Notary Public"))

personally appeared Robert Griego (Name(s) of Signer(s))

☒ personally known to me
☐ proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument

WITNESS my hand and official seal

Signature of Notary Public

ARMANDO HEGGDAHL
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CIVIL ENGINEERS 249 E POMONA BOULEVARD • MONTEREY PARK, CALIFORNIA 91754 • TEL 724 0253
723 5724

June 10, 1976

EXHIBIT "A"

LEGAL DESCRIPTION FOR THE BOUNDARY OF
IRWINDALE CITY INDUSTRIAL REDEVELOPMENT PROJECT

That property in the City of Irwindale, County of Los Angeles, State of California, described as follows:

Beginning at the point of intersection of the northeasterly line of the State Highway, 100 feet wide, known as Foothill Boulevard and also known as Huntington Drive, with the northeasterly prolongation of the southeasterly line of Lot 62 of Tract No. 13436, as shown on map recorded in Book 294, pages 20 and 21 of Maps, records of Los Angeles County, said 100 foot wide State Highway being as shown on State Division of Highways Map No. VII-L.A.-9-G, sheet 14, which map is on file in the office of the County Engineer of said County as County Surveyor's Filed Map No. 10205, and also as described in deed recorded in Book 7848, page 48 of Official Records of said County; thence southeasterly along said northeasterly line of the State Highway Right-of-Way, 100 feet wide as described in deed recorded in Book 7848, page 48 of said Official Records, as shown on Sheets 14, 15, and 16 of said State Division of Highways map, to the northwesterly boundary line of Subdivision No. 2 of the Azusa Land and Water Company as shown on map recorded in Book 43, page 94 of Miscellaneous Records of said County; thence northeasterly along said last mentioned northwesterly boundary line to the southwesterly line of the Pacific Electric Railway spur tract Right-of-Way, 50 feet wide, as described in grant of easement recorded in Book 32974, page 275 of said Official Records; thence northwesterly, northerly and northeasterly along the southwesterly, westerly and northwesterly line of said spur tract Right-of-Way, 50 feet wide, to the intersection with the southerly line of the Pacific Electric Railway Right-of-Way, 100 feet wide, as shown on map recorded in Book 2651, page 215 of Deeds in the office of the Recorder of the County of Los Angeles; thence easterly along said southerly line of said Right-of-Way a distance of 95.76 feet, more or less, to the northwesterly boundary line of said Subdivision No. 2; thence northeasterly along said last mentioned line to the northerly line of said Pacific Electric Railway Right-of-Way, 100 feet wide, which is also a point in the boundary of the City of Azusa as same existed on September 25, 1956; thence easterly along the boundary of said City of Azusa and following all its various courses and directions to the intersection with the northerly prolongation of the west line of the east half of the west half of the northeast quarter of the southeast quarter of Section 4, Township 1 South, Range 10 West, S.B.B.&M; thence

CITY OF IRWINDALE (CONT'D)

southerly along said last mentioned west line to the southwest corner of said east half; thence southerly along the west line of the east half of the northwest quarter of the southeast quarter of the southeast quarter of said section to the south line of said quarter quarter quarter section; thence easterly along quarter quarter quarter section lines to the westerly line of the northeast one-quarter of the southeast one-quarter of the southeast one-quarter of said Section; thence northerly along said westerly line 665 feet to the northerly line of said northeast one-quarter; thence easterly along said northerly line 660 feet to the east line of said section; thence southerly along section lines to a line that is concentric with and 100 feet southerly measured radially from the curved portion of the center line of Big Dalton Wash, shown as "Center Line of Big Dalton Wash Per CSB2034-2", on map of Tract No. 18149, recorded in Book 448, pages 1 to 3 inclusive of said Maps; thence westerly along said concentric line and continuing westerly along a line that is parallel with and 100 feet southerly measured at right angles from the straight line portion of said last mentioned center line, to the northwesterly corner of said last mentioned tract; thence southerly along the westerly line of said last mentioned tract and the southerly prolongation thereof to the center line of Cypress Avenue, as said last mentioned center line is shown on said last mentioned map; thence westerly along the westerly prolongation of said last mentioned center line and continuing westerly along the center line of Cypress Avenue, as said last mentioned center line is shown on map filed in Book 66, page 33 of Record of Surveys, in the office of said recorder, to the northerly prolongation of the most westerly line of Parcel 14, as shown on said last mentioned map; thence southerly along said last mentioned prolongation and continuing southerly, easterly and southerly along the boundary of said parcel to the northwesterly corner of Parcel 15, as shown on said last mentioned map; thence southerly along the westerly line of said last mentioned parcel to the northwesterly corner of Parcel 28, as shown on said last mentioned map; thence easterly along the northerly line of said last mentioned parcel and the easterly prolongation thereof to the center line of Irwindale Avenue, as said last mentioned center line is shown on said last mentioned map; thence southerly along said last mentioned center line and the southerly prolongation thereof, to the northerly prolongation of the center line of Irwindale Avenue, 40 feet wide, as shown on map of Tract No. 17517, recorded in Book 438, pages 1 and 2 of said Maps; thence southerly along said last mentioned prolongation to the easterly prolongation of the northerly line of said last mentioned tract; thence westerly along said last mentioned prolongation and northerly line to the northwesterly corner of said last mentioned tract; thence northerly along the northerly prolongation of the westerly line of said last mentioned tract to a line that is parallel with and 33 feet southerly measured at right angles from the southerly line of the southwest quarter of Section 9, said township and range; thence westerly along said last mentioned parallel line to the boundary of the City of West Covina, as same existed on said date; thence northerly and westerly along said last mentioned boundary to the boundary of the City of Baldwin Park, as same existed on said date; thence westerly along said last mentioned boundary and following the same in all its various courses and curves to the southerly line of the Pacific Electric Railway Company's right of way, 170 feet wide, as shown on map of Tract No. 3278, recorded in Book 36, page 41 of said Maps;

line of Mountain Avenue; thence northerly along said last mentioned easterly line to the southerly line of Meridian Street, as shown on said map of Tract No. 4675; thence easterly along said last mentioned southerly line to the southerly prolongation of the easterly line of Parcel 11, as shown on map filed in Book 29, page 9 of said Record of Surveys; thence northerly along said last mentioned prolongation and easterly line to the northeasterly corner of said Parcel 11, said last mentioned corner also being the southeasterly corner of Tract No. 18492, as shown on map recorded in Book 455, pages 26 and 27 of said Maps; thence northerly along the easterly line of said last mentioned tract to the southerly line of Tract No. 15969, as shown on map recorded in Book 413, pages 16 and 17 of said Maps; thence easterly along the southerly line of said last mentioned tract to the westerly line of Lot 13 in Section 36, Township 1 North, Range 11 West, in said Subdivision of the Rancho Azusa de Duarte; thence northerly along said last mentioned westerly line to the southwesterly prolongation of that certain course in the boundary of Tract No. 14089, shown as having a bearing and length of North 43° 41' 48" East 182.37 feet on map recorded in Book 335, pages 1 to 3 inclusive of said Maps; thence northeasterly along said last mentioned prolongation and continuing northeasterly along the boundary of said last mentioned tract and following the same in all its various courses to the southwesterly line of Galen Street, as shown on map of Tract No. 16739, recorded in Book 414, pages 27 to 29 inclusive of said Maps; thence southeasterly, easterly, northeasterly and easterly along the southwesterly, southerly, southeasterly and southerly lines of said Galen Street to the most westerly line of Tract No. 17750, as shown on map recorded in Book 432, pages 14 and 15 of said Maps; thence southerly along said last mentioned most westerly line to the southwesterly corner of said last mentioned tract; thence easterly along the southerly line of said last mentioned tract to the east line of the westerly 1000 feet of Lot 9 in said last mentioned section; thence southerly along said last mentioned east line to the south line of said last mentioned lot; thence easterly along said last mentioned south line to the southeast corner of said last mentioned Lot; thence southerly along the east line of said last mentioned section to the westerly prolongation of the southerly line of Lot 60 of J. R. Loftus Tract No. 1, as shown on map recorded in Book 14, page 29 of said Maps; thence easterly along said last mentioned prolongation and southerly line to the most westerly corner of Parcel 13, as described in Final Judgement entered in Case No. 1751-Y-Civil of the District Court of the United States for the Southern District of California, Central Division; thence northeasterly along the northwesterly lines of Parcel 13, 15 and 16, as described in Final Judgements entered in said District Court Case to the most northerly corner of said Parcel 16; thence in a direct line to the northerly terminus of the most westerly line of Parcel 17 as described in Final Judgement entered in said District Court Case; thence northerly, northeasterly and easterly along the boundary of said last mentioned parcel to the boundary of Parcel 19, as described in Final Judgement entered in said District Court Case; thence northeasterly and northerly along the boundary of said last mentioned parcel to the southerly line of the parcel of land (Duarte Road) described third in deed to County of Los Angeles, recorded in Book 23835, page 158 of said Official Records; thence easterly along said last mentioned southerly line to the westerly line of Lot 1 in Block 15 of Davis' Addition to Duarte, as shown on map recorded in Book 11, page 72 of said Miscellaneous Records; thence northerly along said last

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thence westerly along said last mentioned southerly line to the easterly line of the 300 foot strip of land shown on map recorded in Book 2611, page 202 of said Deeds; thence southerly and westerly along the boundary of said 300 foot strip of land to a line that is parallel and concentric with and 300 feet westerly and northwesterly measured at right angles and radially from the center line of the 600 foot strip of land (San Gabriel River), as shown on County Surveyor's Filed Map No. 12028 sheets 1 and 2 on file in the office of said Engineer; thence northerly and northeasterly along said last mentioned parallel and concentric line to the northeasterly line of Lot 1 of Tract No. 10369, as shown on map recorded in Book 149, pages 95 and 96 of said Maps; thence northwesterly along said last mentioned northeasterly line to the southwesterly prolongation of the southeasterly line of Lot 2192 of Chicago Park, as shown on map recorded in Book 30, page 100, of said Miscellaneous Records; thence northeasterly in a direct line to the northeasterly corner of Lot 1961 of said Chicago Park; thence northeasterly in a direct line to the southeasterly corner of Lot 1729 of said Chicago Park; thence northeasterly in a direct line to the northeasterly corner of Lot 1496 of said Chicago Park; thence northeasterly in a direct line to the southeasterly corner of Lot 1261 of said Chicago Park; thence northeasterly in a direct line to the northeasterly corner of Lot 1019 of said Chicago Park; thence northeasterly in a direct line to the southeasterly corner of Lot 776 of said Chicago Park; thence northeasterly in a direct line to the northeasterly corner of Lot 532 of said Chicago Park; thence northwesterly along the southwesterly line of State Street, 50 feet wide, as shown on said map of Chicago Park to the northwesterly corner of Lot 513 of said Chicago Park; thence northwesterly in a direct line to the northeasterly corner of Lot 512 of said Chicago Park; thence northwesterly along the southwesterly line of said State Street to the northwesterly corner of Lot 417 of said Chicago Park; thence northwesterly in a direct line to the northeasterly corner of Lot E of said Chicago Park; thence northwesterly along the southwesterly line of said State Street and the northwesterly prolongation thereof to the boundary of the City of Arcadia as same existed on said date; thence northeasterly along said last mentioned boundary and continuing northeasterly along the boundary of the City of Monrovia as same existed on said date and following the same in all its various courses and curves to the northerly line of Lot 4 in Section 2, Township 1 South, Range 11 West, in the Subdivision of the Rancho Azusa de Duarte, as shown on map recorded in Book 6, pages 80 to 82 inclusive of said Miscellaneous Records; thence easterly along said last mentioned northerly line and continuing easterly along the northerly line of Lot 5 in Section 1, said last mentioned township and range, as shown on said last mentioned map, to the southerly prolongation of the easterly line of Mountain Avenue, 60 feet wide, as shown on map of Tract No. 4675, recorded in Book 99, page 34 of said Maps; thence northerly along said last mentioned prolongation and easterly line to the southerly line of Lot 10 of said last mentioned tract; thence easterly along the southerly line of said last mentioned lot to the southeasterly corner of Tract No. 15644, as shown on map recorded in Book 345, pages 46 and 47 of said Maps; thence northerly along the easterly line of said last mentioned tract to the northeasterly corner thereof; thence westerly along the northerly line of said last mentioned tract to said easterly

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mentioned westerly line to the northwesterly corner of said last mentioned lot; thence northerly in a direct line to the southwesterly corner of Lot 2 in Block 10 of said Davis' Addition; thence northerly in a direct line to the northwesterly corner of Lot 1 in said last mentioned block; thence easterly in a direct line to the northeasterly corner of Lot 5 in said last mentioned block; thence easterly in a direct line to the northwesterly corner of Lot 1 in Block 11 of said Davis' Addition; thence easterly in a direct line through the northeasterly corner of Lot 5 in said last mentioned block to the easterly line of Flower Avenue, as shown on said last mentioned map; thence northerly along said last mentioned easterly line to the northerly line of Block 12 of said Davis' Addition; thence easterly along said last mentioned northerly line and the easterly prolongation thereof to the east line of Section 31, Township 1 North, Range 10 West, in said Subdivision of the Rancho Azusa de Duarte; thence northerly along said last mentioned east line to the most southerly corner of Tract No. 14824, as shown on map recorded in Book 322, pages 36 and 37 of said Maps; thence northeasterly and easterly along the boundary of said last mentioned tract and continuing easterly along the southerly lines of Lots 13 and 14 in Section 29, said last mentioned township and range, to the boundary of Tract No. 20006, as shown on map recorded in Book 536, pages 7 to 9 inclusive of said Maps; thence southerly along said last mentioned boundary and following the same in all its various courses and curves to the northwesterly line of Lot 107 of Tract No. 16333, as shown on map recorded in Book 382, pages 20 and 21 of said Maps; thence northeasterly along the boundary of said last mentioned lot and following the same in all its various courses and curves to the most northerly corner thereof; thence northeasterly along the boundary of said last mentioned tract to the boundary of said Tract No. 13436; thence southeasterly along said last mentioned boundary and following the same in all its various courses and curves to the most southerly corner of Lot 62 of said last mentioned tract; thence northeasterly along the southeasterly line of said last mentioned lot and the northeasterly prolongation thereof to the point of beginning;

EXCEPTING therefrom the following described Parcels A through G, inclusive:

Parcel A

Lots 1 through 5, inclusive, as shown on Map of Tract No. 4675 recorded in Book 99, Page 34 of Maps, in the office of the County Recorder of said County, and that portion of Lot 6 of said Tract 4675 lying westerly of the northerly prolongation of the easterly boundary of Tract No. 15644, as recorded in Book 345, Pages 46 and 47 of Maps of said office.

Parcel B

Blocks 10, 11 and the westerly one-half of 12, of Davis' Addition to Duarte recorded in Book 11, Page 72 of Miscellaneous Records, in the office of the County Recorder of said County.

CITY OF IRWINDALE (CONT'D)

Parcel C

Lots 1 through 22, inclusive, of Tract No. 4316, recorded in Book 50, Page 5 of Maps in the office of the County Recorder of said County, and that portion of the southwest one-quarter of the southeast one-quarter of the southeast one-quarter of Section 4, Township 1 South, Range 10 West, S.B.B.M., lying southerly of Lot 10 of said Tract No. 4316 and between the southerly prolongations of the westerly and easterly lines of said Lot 10 of said Tract 4316.

EXCEPTING therefrom those portions dedicated to the public use for street and highway purposes.

Parcel D

Parcels 1 through 38, inclusive, of Licensed Surveyor Map, recorded in Book 14, Page 32 of Records of Survey, in the office of the County Recorder of said County, and that portion of the east 10 acres of the north twenty acres of the east one-half of the northwest one-quarter of Section 9, Township 1 South, Range 10 West, S.B.B.M., lying easterly of the northerly prolongation of the westerly line of said Parcel 7, northerly of the northerly line of said Parcels 7 and 8, and lying westerly of the westerly line of said Parcel 6 and the southerly prolongation thereof;

EXCEPTING therefrom those portions dedicated to the public use for street and highway purposes.

Parcel E

Parcels 1 through 10 inclusive, 12 through 63 inclusive, and 66 through 76 inclusive, as shown on map recorded in Book 4, Pages 58 through 61, inclusive, of Official Maps, in the office of the County Recorder of said County, and that portion of Parcel 11 of said map lying southerly of a line that is parallel with, and 300 feet southerly, measured at right angles, from the northerly line of said Parcel 11,

EXCEPTING therefrom those portions dedicated to the public use for street and highway purposes.

Parcel F

Lot 6 and the easterly 145 feet of Lot 7 of the Orange Belt Tract as shown on Map recorded in Book 37 page 67 of Miscellaneous Records, in the office of the County Recorder of said County;

EXCEPTING therefrom those portions dedicated to the public use for street and highway purposes.

CITY OF IRWINDALE (CONT'D)

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Parcel 6

Lot 11 of Tract No. 1497, as shown on Map recorded in Book 21 Page 109 of Maps, in the office of the County Recorder of said County.

EXCEPTING therefrom those portions dedicated to the public use for street and highway purposes.

W. J. Lockman, R.E. 10290

WJL/jw

EDR-City Directory

Appendix D

17.5-Acre Vacant Lot
Live Oak Avenue
Irwindale, CA 91706

Inquiry Number: 2516447.4
June 24, 2009

The EDR-City Directory Abstract

Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

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Findings

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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2009 Enhancements to EDR City Directory Abstract

New for 2009, the EDR City Directory Abstract has been enhanced with additional information and features. These enhancements will make your city directory research process more efficient, flexible, and insightful than ever before. The enhancements will improve the options for selecting adjoining properties, and will speed up your review of the report.

City Directory Report. Three important enhancements have been made to the EDR City Directory Abstract:

1. *Executive Summary.* The report begins with an Executive Summary that lists the sources consulted in the preparation of the report. Where available, a parcel map is also provided within the report, showing the locations of properties researched.

2. *Page Images.* Where available, the actual page source images will be included in the Appendix, so that you can review them for information that may provide additional insight. EDR has copyright permission to include these images.

3. *Findings Listed by Location.* Another useful enhancement is that findings are now grouped by address. This will significantly reduce the time you need to review your abstracts. Findings are provided under each property address, listed in reverse chronological order and referencing the source for each entry.

Options for Selecting Adjoining Properties. Ensuring that the right adjoining property addresses are searched is one of the biggest challenges that environmental professionals face when conducting city directory historical research. EDR's new enhancements make it easier for you to meet this challenge. Now, when you place an order for the EDR City Directory Abstract, you have the following choices for determining which addresses should be researched.

1. *You Select Addresses and EDR Selects Addresses.* Use the "Add Another Address" feature to specify the addresses you want researched. Your selections will be supplemented by addresses selected by EDR researchers using our established research methods. Where available, a digital map will be shown, indicating property lines overlaid on a color aerial photo and their corresponding addresses. Simply use the address list below the map to check off which properties shown on the map you want to include. You may also select other addresses using the "Add Another Address" feature at the bottom of the list.

2. *EDR Selects Addresses.* Choose this method if you want EDR's researchers to select the addresses to be researched for you, using our established research methods.

3. *You Select Addresses.* Use this method for research based solely on the addresses you select or enter into the system.

4. *Hold City Directory Research Option.* If you choose to select your own adjoining addresses, you may pause production of your EDR City Directory Abstract report until you have had a chance to look at your other EDR reports and sources. Sources for property addresses include: your Certified Sanborn Map Report may show you the location of property addresses; the new EDR Property Tax Map Report may show the location of property addresses; and your field research can supplement these sources with additional address information. To use this capability, simply click "Hold City Directory research" box under "Other Options" at the bottom of the page. Once you have determined what addresses you want researched, go to your EDR Order Status page, select the EDR City Directory Abstract, and enter the addresses and submit for production.

Questions? Contact your EDR representative at 800-352-0050. For more information about all of EDR's 2009 report and service enhancements, visit www.edrnet.com/2009enhancements

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at five year intervals.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

Year	Source	TP	Adjoining	Text Abstract	Source Image
2008	Haines Criss-Cross Directory	-	X	X	-
2000	Haines Criss-Cross Directory	-	X	X	-
1994	Haines Criss-Cross Directory	-	X	X	-
1990	Haines Criss-Cross Directory	-	X	X	-
1986	Haines Criss-Cross Directory	-	X	X	-

EXECUTIVE SUMMARY

SELECTED ADDRESSES

The following addresses were selected by the client, for EDR to research. An "X" indicates where information was identified.

Address	*Type*	*Findings*
14160 Live Oak Ave	Client Entered	X
14254 Live Oak Ave	Client Entered	X

FINDINGS

TARGET PROPERTY INFORMATION

ADDRESS

Live Oak Avenue
Irwindale, CA 91706

FINDINGS DETAIL

Target Property research detail.

No Addresses Found

FINDINGS

ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

Live Oak Ave

Live Oak Ave

Year	*Uses*	*Source*
2008	No address listings beyond (14254) Live Oak Ave	Haines Criss-Cross Directory
2000	No address listings beyond (14254) Live Oak Ave	Haines Criss-Cross Directory
1994	No address listings beyond (14254) Live Oak Ave	Haines Criss-Cross Directory
1990	No address listings beyond (14254) Live Oak Ave	Haines Criss-Cross Directory
1986	No address listings beyond (14180) Live Oak Ave	Haines Criss-Cross Directory

14140 Live Oak Ave

Year	*Uses*	*Source*
2008	Acme Portable Machines	Haines Criss-Cross Directory
	Office Building (5 Occupants)	Haines Criss-Cross Directory
2000	Acme Portable Machines	Haines Criss-Cross Directory
	Nichols Sales Inc	Haines Criss-Cross Directory
1994	Multi Duti Mfg Inc	Haines Criss-Cross Directory
	Office Building (7 Occupants)	Haines Criss-Cross Directory
1990	Multi Duti Mfg Inc	Haines Criss-Cross Directory
	Office Building (6 Occupants)	Haines Criss-Cross Directory
	Sinecera Mfg Co	Haines Criss-Cross Directory
1986	M D M Inc	Haines Criss-Cross Directory
	Princeton Graphic S	Haines Criss-Cross Directory

14160 Live Oak Ave

Year	*Uses*	*Source*
2008	Office Building (6 Occupants)	Haines Criss-Cross Directory
2000	Ferreira Service	Haines Criss-Cross Directory
	Shelcomm	Haines Criss-Cross Directory
	Sunburst Drapery	Haines Criss-Cross Directory
1994	Office Building (5 Occupants)	Haines Criss-Cross Directory
1990	Office Building (6 Occupants)	Haines Criss-Cross Directory

FINDINGS

Year	Uses	Source
1986	H L C Electric Supply	Haines Criss-Cross Directory

14180 Live Oak Ave

Year	Uses	Source
2008	Office Building (6 Occupants)	Haines Criss-Cross Directory
2000	Office Building (6 Occupants)	Haines Criss-Cross Directory
1994	Office Building (5 Occupants)	Haines Criss-Cross Directory
1990	Office Building (8 Occupants)	Haines Criss-Cross Directory
1986	Bart Enterprises	Haines Criss-Cross Directory
	Charleyca Inc	Haines Criss-Cross Directory
	Jona Suoo Entp	Haines Criss-Cross Directory
	Steno Aide Inc	Haines Criss-Cross Directory

14254 Live Oak Ave

Year	Uses	Source
2008	K J Patterson Inc	Haines Criss-Cross Directory
2000	Residential	Haines Criss-Cross Directory
1994	Ascot Basket Works	Haines Criss-Cross Directory
1990	No Return	Haines Criss-Cross Directory

FINDINGS

TARGET PROPERTY: ADDRESS NOT LISTED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not listed in the research source.

Address Researched	Address Not Listed in Research Source
Live Oak Avenue	2008, 2000, 1994, 1990, 1986

ADJOINING PROPERTY: ADDRESSES NOT LISTED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not listed in research source.

Address Researched	Address Not Listed in Research Source
14254 Live Oak Ave	1986

EDR-Radius Map Report

Appendix E

17.5-Acre Vacant Lot
Live Oak Avenue
Irwindale, CA 91706

Inquiry Number: 2516447.2s
June 11, 2009

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

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with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

LIVE OAK AVENUE
IRWINDALE, CA 91706

COORDINATES

Latitude (North):	34.108200 - 34° 6' 29.5''
Longitude (West):	117.966700 - 117° 58' 0.1''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	410837.1
UTM Y (Meters):	3774380.0
Elevation:	418 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	34117-A8 BALDWIN PARK, CA
Most Recent Revision:	1981
North Map:	34117-B8 AZUSA, CA
Most Recent Revision:	1972

AERIAL PHOTOGRAPHY IN THIS REPORT

Photo Year:	2005
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL---------- National Priority List

EXECUTIVE SUMMARY

Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS NFRAP site List

CERC-NFRAP ---------- CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Transporters, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE ---------- State Response Sites

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

AST ---------- Aboveground Petroleum Storage Tank Facilities
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing
VCP ---------- Voluntary Cleanup Program Properties

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

EXECUTIVE SUMMARY

Local Lists of Landfill / Solid Waste Disposal Sites

ODI	Open Dump Inventory
DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations
WMUDS/SWAT	Waste Management Unit Database
HAULERS	Registered Waste Tire Haulers Listing
INDIAN ODI	Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL	Clandestine Drug Labs
HIST Cal-Sites	Historical Calsites Database
SCH	School Property Evaluation Program
Toxic Pits	Toxic Pits Cleanup Act Sites

Local Land Records

LIENS 2	CERCLA Lien Information
LUCIS	Land Use Control Information System
LIENS	Environmental Liens Listing
DEED	Deed Restriction Listing

Records of Emergency Release Reports

LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing

Other Ascertainable Records

DOT OPS	Incident and Accident Data
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
RAATS	RCRA Administrative Action Tracking System
CA BOND EXP. PLAN	Bond Expenditure Plan
CA WDS	Waste Discharge System
Cortese	"Cortese" Hazardous Waste & Substances Sites List
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants	EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR Historical Cleaners ----- EDR Proprietary Historic Dry Cleaners

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS list

CERCLIS: The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the CERCLIS list, as provided by EDR, and dated 01/09/2009 has revealed that there is 1 CERCLIS site within approximately 0.75 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
JONELL OIL CORP	***13649 LIVE OAK LANE***	***NW 1/2 - 1 (0.668 mi.)***	***T132***	***128***

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 11/12/2008 has revealed that there are 10 RCRA-SQG sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GOMEZ TRUCK SERVICE	***1580 E ARROW HWY***	***NW 1/4 - 1/2 (0.476 mi.)***	***M114***	***98***

Lower Elevation	Address	Direction / Distance	Map ID	Page
UNITED CONCRETE PIPE CORP	***14041 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.138 mi.)***	***C25***	***20***
HUGHES FAMILY MARKETS INC	***14005 LIVE OAK***	***SW 1/8 - 1/4 (0.173 mi.)***	***C44***	***34***

Lower Elevation	Address	Direction / Distance	Map ID	Page
B AND W PRECISION INC	***13955 LIVE OAK AVE***	***WSW 1/8 - 1/4 (0.216 mi.)***	***G58***	***45***
WEBSTERS REFUSE DISPOSAL	***13940 LIVE OAK***	***WSW 1/4 - 1/2 (0.251 mi.)***	***G66***	***51***
BLUE SKY AVIATION INC	***5188 COMMERCE DR***	***WSW 1/4 - 1/2 (0.363 mi.)***	***I74***	***67***
TOUCHDOWN TECHNOLOGIES	5188 COMMERCE DRIVE	WSW 1/4 - 1/2 (0.363 mi.)	I75	70
ARYANA CORP DBA MMC PHT	***5170 COMMERCE DR***	***WSW 1/4 - 1/2 (0.377 mi.)***	***I79***	***73***
COVENTRY MFG CO INC	***5152 COMMERCE DR***	***WSW 1/4 - 1/2 (0.388 mi.)***	***K82***	***75***
COMPOSITE STRUCTURES	***13800 LIVE OAK AVE BLDG***	***WSW 1/4 - 1/2 (0.457 mi.)***	***O108***	***91***

State- and tribal - equivalent CERCLIS

AOCONCERN: San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

A review of the AOCONCERN list, as provided by EDR, and dated 12/31/1998 has revealed that there is 1 AOCONCERN site within approximately 1.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SAN GABRIEL VALLEY		ESE 1/4 - 1/2 (0.430 mi.)	0	7

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 02/23/2009 has revealed that there is 1 ENVIROSTOR site within approximately 1.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
UNITED CONCRETE PIPE CORP	***14041 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.138 mi.)***	***C25***	***20***
Status: No Further Action				

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Integrated Waste Management Board's Solid Waste Information System (SWIS) database.

A review of the SWF/LF list, as provided by EDR, and dated 03/09/2009 has revealed that there are 4 SWF/LF sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LIVINGSTON-GRAHAM INC	***13550 LIVE OAK AV***	***NW 1/4 - 1/2 (0.496 mi.)***	***Q121***	***104***

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ALLAN COMPANY BALDWIN PARK	14604-14618 ARROW HIGHW	E 1/2 - 1 (0.560 mi.)	S125	117
LONGDEN AVE DISPOSAL SITE	201-545 LONGDEN AVENUE	E 1/2 - 1 (0.622 mi.)	129	124
Lower Elevation	**Address**	**Direction / Distance**	**Map ID**	**Page**
NU-WAY LIVE OAK LANDFILL/WASTE	13620 LIVE OAK LANE	WNW 1/2 - 1 (0.652 mi.)	130	125

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 04/08/2009 has revealed that there are 11 LUST sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHUMO CONSTRUCTION	***14427 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.419 mi.)***	***L94***	***85***
Status: Completed - Case Closed				
ARROW FIELD SERVICE	***1580 ARROW HWY***	***NW 1/4 - 1/2 (0.476 mi.)***	***M112***	***95***
Status: Completed - Case Closed				
LIVINGSTON-GRAHAM	***13550 LIVE OAK AVE***	***NW 1/4 - 1/2 (0.496 mi.)***	***Q123***	***111***
Status: Completed - Case Closed				
ALLAN COMPANY	14620 EAST JOANBRIDGE S	ESE 1/2 - 1 (0.554 mi.)	124	116
Status: Completed - Case Closed				
CAL-MAT PROPERTIES	***14626 ARROW HWY E***	***E 1/2 - 1 (0.584 mi.)***	***S127***	***122***
Status: Completed - Case Closed				
M. F. BOLSTER FLOORING CO.	***5020 BLEECKER ST.***	***ESE 1/2 - 1 (0.736 mi.)***	***134***	***132***
Lower Elevation	**Address**	**Direction / Distance**	**Map ID**	**Page**
UNITED CONCRETE PIPE CORP	***14041 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.138 mi.)***	***C25***	***20***
Status: Completed - Case Closed				
THE REALTY ASSOCIATES FUND VLP	5305 NORTH RIVERGRADE R	W 1/8 - 1/4 (0.152 mi.)	D31	28
Status: Completed - Case Closed				
WEBSTERS REFUSE DISPOSAL	***13940 LIVE OAK***	***WSW 1/4 - 1/2 (0.251 mi.)***	***G66***	***51***
Status: Completed - Case Closed				
CF MOTORFREIGHT	***13645 LIVE OAK LN***	***NW 1/2 - 1 (0.662 mi.)***	***T131***	***125***
Status: Completed - Case Closed				
GRIFFITH COMPANY	***1380 ARROW HWY***	***NW 1/2 - 1 (0.700 mi.)***	***133***	***131***
Status: Completed - Case Closed				

SLIC: SLIC Region comes from the California Regional Water Quality Control Board.

A review of the SLIC list, as provided by EDR, and dated 04/08/2009 has revealed that there are 6 SLIC sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SUNBURST DRAPERY CLEANERS Facility Status: Open - Site Assessment	14160 LIVE OAK AVE. #B	SE 0 - 1/8 (0.120 mi.)	A14	15
VALLEY COUNTY WATER DIST Facility Status: Open - Reopen Case	14233 JOANBRIDGE ST.	SE 1/8 - 1/4 (0.213 mi.)	F55	43
M. F. BOLSTER FLOORING CO. Facility Status: Completed - Case Closed	***5020 BLEECKER ST.***	***ESE 1/2 - 1 (0.736 mi.)***	***134***	***132***

Lower Elevation	Address	Direction / Distance	Map ID	Page
KOLL BUSINESS	14041 LIVE OAK	SW 1/8 - 1/4 (0.139 mi.)	C27	25
KOLL BUSINESS Facility Status: Open	14041 E. LIVE OAK AVE	SW 1/8 - 1/4 (0.139 mi.)	C29	27
HUGHES MARKETS Facility Status: Open - Site Assessment	14005 E. LIVE OAK AVE.	SW 1/8 - 1/4 (0.173 mi.)	C40	33

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, and dated 04/08/2009 has revealed that there are 6 UST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
VALLEY CO WATER DISTRICT	***14233 E JOANBRIDGE ST***	***SE 1/8 - 1/4 (0.213 mi.)***	***F54***	***43***
ARROW FUEL SERVICE	1580 ARROW HWY	NW 1/4 - 1/2 (0.476 mi.)	M111	94

Lower Elevation	Address	Direction / Distance	Map ID	Page
HUGHES MARKET INC	14005 LIVE OAK AVE	SW 1/8 - 1/4 (0.173 mi.)	C43	34
WASTE MGT-SAN GABRIEL/POMONA V	***13940 LIVE OAK AVE***	***WSW 1/4 - 1/2 (0.251 mi.)***	***G69***	***65***
HOME SAVINGS OF AMERICA,	5050 COMMERCE DR	WSW 1/4 - 1/2 (0.408 mi.)	K88	82
ALL AMERICAN ASPHALT	13646 LIVE OAK LN	WNW 1/4 - 1/2 (0.450 mi.)	106	91

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: A listing of recycling facilities in California.

A review of the SWRCY list, as provided by EDR, and dated 04/07/2009 has revealed that there are 2

SWRCY sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GREENHOUSE RECYCLING	1620 E ARROW HWY	NW 1/4 - 1/2 (0.427 mi.)	M98	87
ALLAN CO	***14618 ARROW HWY***	***E 1/2 - 1 (0.573 mi.)***	***S126***	***117***

Local Lists of Hazardous waste / Contaminated Sites

AOCONCERN: San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

A review of the AOCONCERN list, as provided by EDR, and dated 12/31/1998 has revealed that there is 1 AOCONCERN site within approximately 1.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SAN GABRIEL VALLEY		ESE 1/4 - 1/2 (0.430 mi.)	0	7

CDL: A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

A review of the CDL list, as provided by EDR, and dated 09/30/2008 has revealed that there is 1 CDL site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	14107 CRAGMONT DR	S 1/8 - 1/4 (0.246 mi.)	62	50

Local Lists of Registered Storage Tanks

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there are 4 CA FID UST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RAY GASKIA	***14312 ARROW HWY***	***ESE 1/8 - 1/4 (0.244 mi.)***	***H60***	***48***
CHUMO CONSTRUCTION INC	***14427 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.419 mi.)***	***L93***	***84***
WEESHOFF ENTERPRIZES INC	***14460 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.437 mi.)***	***L105***	***90***

Lower Elevation	Address	Direction / Distance	Map ID	Page
WEBSTERS REFUSE DISPOSAL	***13940 LIVE OAK***	***WSW 1/4 - 1/2 (0.251 mi.)***	***G66***	***51***

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 7 HIST UST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GARAGE AND WAREHOUSE	14233 JOANBRIDGE STREET	SE 1/8 - 1/4 (0.213 mi.)	F52	40
CROWNER SHEET METAL PRODUCT.,	***14346 ARROW HWY***	***ESE 1/4 - 1/2 (0.292 mi.)***	***72***	***66***
CHUMO CONSTRUCTION INC	***14427 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.419 mi.)***	***L92***	***83***
WEESHOFF EQUIPMENT CO.	14460 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.437 mi.)	L104	89

Lower Elevation	Address	Direction / Distance	Map ID	Page
UNITED CONCRETE PIPE	14041 LIVE OAK AVE	SW 1/8 - 1/4 (0.139 mi.)	C26	24
WEBSTERS REFUSE DISPOSAL	***13940 LIVE OAK***	***WSW 1/4 - 1/2 (0.251 mi.)***	***G66***	***51***
SCA/WEBSTER'S REFUSE DISPOSAL	13940 LIVE OAK AVE	WSW 1/4 - 1/2 (0.251 mi.)	G68	63

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there are 11 SWEEPS UST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
VALLEY CO WATER DISTRICT	***14233 JOANBRIDGE***	***SE 1/8 - 1/4 (0.213 mi.)***	***F53***	***41***
RAY GASKIA	***14312 ARROW HWY***	***ESE 1/8 - 1/4 (0.244 mi.)***	***H60***	***48***
CHUMO CONSTRUCTION INC	***14427 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.419 mi.)***	***L93***	***84***
WEESHOFF ENTERPRIZES INC	***14460 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.437 mi.)***	***L105***	***90***
ARROW FIELD SREVICE	***1580 E ARROW HWY***	***NW 1/4 - 1/2 (0.476 mi.)***	***M113***	***96***
TENNER CAL CONSTRUCTION	***14530 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.493 mi.)***	***P119***	***101***
BLUE DIAMOND MATERIALS	***13550 LIVE OAK AVE***	***NW 1/4 - 1/2 (0.496 mi.)***	***Q122***	***106***

Lower Elevation	Address	Direction / Distance	Map ID	Page
UNITED CONCRETE PIPE CO	***14041 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.139 mi.)***	***C28***	***26***
HUGHES MARKETS INC	***14005 LIVE OAK AVE***	***SW 1/8 - 1/4 (0.173 mi.)***	***C46***	***36***
WEBSTERS REFUSE DISPOSAL	***13940 LIVE OAK***	***WSW 1/4 - 1/2 (0.251 mi.)***	***G66***	***51***
HOME SAVINGS OF AMERICA	***5050 COMMERCE DR***	***WSW 1/4 - 1/2 (0.408 mi.)***	***K87***	***80***

Records of Emergency Release Reports

HMIRS: The Hazardous Materials Incident Report System contains hazardous material spill incidents reported to the Department of Transportation. The source of this database is the U.S. EPA.

A review of the HMIRS list, as provided by EDR, and dated 03/31/2009 has revealed that there is 1 HMIRS site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	LIVE OAK @ ARROW HWY	WSW 1/8 - 1/4 (0.179 mi.)	C48	38

CHMIRS: The California Hazardous Material Incident Report System contains information on reported hazardous material incidents, i.e., accidental releases or spills. The source is the California Office of Emergency Services.

A review of the CHMIRS list, as provided by EDR, and dated 12/31/2007 has revealed that there is 1 CHMIRS site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	14120 LIVE OAK	SSE 0 - 1/8 (0.106 mi.)	A2	7

Other Ascertainable Records

RCRA-NonGen: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA-NonGen list, as provided by EDR, and dated 11/12/2008 has revealed that there is 1 RCRA-NonGen site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MB TRUCKING	13537 LIVE OAK LANE	NW 1/4 - 1/2 (0.482 mi.)	Q116	99

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 04/28/2009 has revealed that there are 3 FINDS sites within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
UNITED CONCRETE PIPE CORP	***14041 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.138 mi.)***	***C25***	***20***
HUGHES FAMILY MARKETS INC	***14005 LIVE OAK***	***SW 1/8 - 1/4 (0.173 mi.)***	***C44***	***34***
B AND W PRECISION INC	***13955 LIVE OAK AVE***	***WSW 1/8 - 1/4 (0.216 mi.)***	***G58***	***45***

NPDES: A listing of NPDES permits, including stormwater.

A review of the NPDES list, as provided by EDR, and dated 03/09/2009 has revealed that there is 1 NPDES site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
STORM DRAIN & STREET REHAB PRO	ARROW HWY / LIVE OAK	ESE 1/8 - 1/4 (0.236 mi.)	H59	47

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES].

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 4 HIST CORTESE sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHUMO CONSTRUCTION INC	***14427 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.419 mi.)***	***L92***	***83***
ARROW FIELD SERVICE	***1580 ARROW HWY***	***NW 1/4 - 1/2 (0.476 mi.)***	***M112***	***95***
Lower Elevation	**Address**	**Direction / Distance**	**Map ID**	**Page**
UNITED CONCRETE PIPE CORP	***14041 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.138 mi.)***	***C25***	***20***
WASTE MANGAGEMENT OF SAN GABRI	***13940 LIVE OAK***	***WSW 1/4 - 1/2 (0.251 mi.)***	***G67***	***61***

Notify 65: Notify 65 records contain facility notifications about any release that could impact drinking water and thereby expose the public to a potential health risk. The data come from the State Water Resources Control Board's Proposition 65 database.

A review of the Notify 65 list, as provided by EDR, and dated 10/21/1993 has revealed that there are 2 Notify 65 sites within approximately 1.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CHEM ARROW	13643 LIVE OAK	W 1/2 - 1 (0.607 mi.)	128	124
WESTERN EMULSION CO.	284 LIVE OAK	W 1 - 2 (1.219 mi.)	135	135

The Los Angeles County Site Mitigation Log comes from Community Health Services.

A review of the LA Co. Site Mitigation list, as provided by EDR, and dated 02/11/2009 has revealed that there is 1 LA Co. Site Mitigation site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
UNITED CONCRETE PIPE CO	***14041 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.139 mi.)***	***C28***	***26***

DRYCLEANERS: A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaners' agents; linen supply; coin-operated laundries and cleaning; drycleaning plants except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

A review of the DRYCLEANERS list, as provided by EDR, and dated 05/06/2009 has revealed that there is 1 DRYCLEANERS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SUNBURST DRAPERY CLEANERS & FI	***14160 LIVE OAK AVE #B***	***SE 0 - 1/8 (0.120 mi.)***	***A13***	***12***

EXECUTIVE SUMMARY

Los Angeles County Industrial Waste and Underground Storage Tank Sites.

A review of the LOS ANGELES CO. HMS list, as provided by EDR, and dated 11/26/2008 has revealed that there are 11 LOS ANGELES CO. HMS sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
VALLEY CO WATER DISTRICT	***14233 E JOANBRIDGE ST***	***SE 1/8 - 1/4 (0.213 mi.)***	***F54***	***43***
CHRIS OVERTON	14312 E ARROW HWY	ESE 1/8 - 1/4 (0.244 mi.)	H61	49
Lower Elevation	**Address**	**Direction / Distance**	**Map ID**	**Page**
THE REALTY ASSOCIATES FUND VLP	5305 N RIVERGRADE RD	W 1/8 - 1/4 (0.152 mi.)	D33	30
HUGHES MARKETS INC	5305 N RIVERGRADE RD	W 1/8 - 1/4 (0.152 mi.)	D34	30
RALPHS GROCERY CO	5305 N RIVERGRADE RD	W 1/8 - 1/4 (0.152 mi.)	D36	31
TANIMURA DISTRIBUTING INC	5301 N RIVERGRADE RD	W 1/8 - 1/4 (0.166 mi.)	D38	32
US PIPE & FOUNDRY CO	***14005 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.173 mi.)***	***C41***	***33***
THE REALTY ASSOCIATES FUND	14005 E LIVE OAK AVE	SW 1/8 - 1/4 (0.173 mi.)	C42	34
HUGHES MARKET (SEE FN 038592)	14005 E LIVE OAK AVE	SW 1/8 - 1/4 (0.173 mi.)	C45	35
HUGHES MARKETS INC	***14005 LIVE OAK AVE***	***SW 1/8 - 1/4 (0.173 mi.)***	***C46***	***36***
B&W PRECISION INC	13955 E LIVE OAK AVE	WSW 1/8 - 1/4 (0.216 mi.)	G57	44

WIP: Well Investigation Program case in the San Gabriel and San Fernando Valley area.

A review of the WIP list, as provided by EDR, and dated 03/31/2009 has revealed that there are 62 WIP sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ELAINE'S CONTRACTING Facility Status: Historical	14254 ARROW HWY	NNE 0 - 1/8 (0.094 mi.)	1	7
SEIZMIC INC. Facility Status: Historical	14160 LIVE OAK AVE	SE 0 - 1/8 (0.120 mi.)	A12	11
SUNBURST DRAPERY CLEANERS & FI Facility Status: Backlog	***14160 LIVE OAK AVE #B***	***SE 0 - 1/8 (0.120 mi.)***	***A13***	***12***
SHELCOMM Facility Status: Historical	14160 LIVE OAK AVE	SE 0 - 1/8 (0.120 mi.)	A15	16
TIMES INTERNATIONAL COMPUTERS Facility Status: Historical	14160 LIVE OAK AVE	SE 0 - 1/8 (0.120 mi.)	A16	16
FULLER & ASSOCIATES Facility Status: Historical	14160 LIVE OAK AVE	SE 0 - 1/8 (0.120 mi.)	A17	16
HART ENTERPRISES Facility Status: Historical	14160 LIVE OAK AVE	SE 0 - 1/8 (0.120 mi.)	A18	17
INTEGRATED COMPUTER SERVICE Facility Status: Historical	14180 LIVE OAK AVE	SE 1/8 - 1/4 (0.130 mi.)	B20	18
SEIZMIC INC.	14180 LIVE OAK AVE	SE 1/8 - 1/4 (0.130 mi.)	B21	19
J & B REFRIGERATION INC. Facility Status: Historical	14180 LIVE OAK AVE	SE 1/8 - 1/4 (0.130 mi.)	B22	19
STENO-AIDE, INC. Facility Status: Historical	14180 LIVE OAK AVE	SE 1/8 - 1/4 (0.130 mi.)	B23	19
CERA, INC.	14180 LIVE OAK AVE	SE 1/8 - 1/4 (0.130 mi.)	B24	19
VALLEY CO WATER DISTRICT Facility Status: Backlog	***14233 JOANBRIDGE***	***SE 1/8 - 1/4 (0.213 mi.)***	***F53***	***41***
RAY GASKIA Facility Status: Historical	***14312 ARROW HWY***	***ESE 1/8 - 1/4 (0.244 mi.)***	***H60***	***48***

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ROYAL OAKS BODY SHOP	14314 ARROW HWY	ESE 1/8 - 1/4 (0.247 mi.)	H63	50
BPS TRUCK PARTS Facility Status: Historical	14316 ARROW HWY	ESE 1/8 - 1/4 (0.250 mi.)	H65	51
CALIFORNIA CLOSET CO.,	14338 E ARROW HWY	ESE 1/4 - 1/2 (0.281 mi.)	H70	65
PERFORMANCE RECOVERY INC Facility Status: Historical	***14340 ARROW HWY***	***ESE 1/4 - 1/2 (0.283 mi.)***	***H71***	***65***
CROWNER SHEET METAL PRODUCT., Facility Status: Historical	***14346 ARROW HWY***	***ESE 1/4 - 1/2 (0.292 mi.)***	***72***	***66***
BT ENTERPRISES Facility Status: Historical	14343 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.300 mi.)	73	67
RUDY'S TIRES Facility Status: Historical	14402 ARROW HWY	ESE 1/4 - 1/2 (0.372 mi.)	J78	73
J.R. CUSTOM CABINETS Facility Status: Historical	***14412 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.404 mi.)***	***L85***	***79***
L & N TIRE Facility Status: Historical	5122 N MAINE AVE	ESE 1/4 - 1/2 (0.408 mi.)	L86	80
KAYMAY AUTOMOTIVE Facility Status: Historical	5116 MAINE AVE	ESE 1/4 - 1/2 (0.414 mi.)	L89	82
MO-CO PRODUCTS Facility Status: Historical	14434 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.418 mi.)	L90	82
J. C. BOOKCASE MFG. CO. Facility Status: Historical	14434 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.418 mi.)	L91	83
CHUMO CONSTRUCTION Facility Status: Historical	***14427 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.419 mi.)***	***L94***	***85***
CHUMO CONSTRUCTION INC. Facility Status: Historical	14424 ARROW HWY	ESE 1/4 - 1/2 (0.421 mi.)	J96	86
JOHN'S BACKHOE Facility Status: Historical	14440 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.423 mi.)	L97	87
METCALF LATHING	14439 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.431 mi.)	L99	87
J & M INDUSTRIES	14439 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.431 mi.)	L100	88
ODIN FORGE	14439 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.431 mi.)	L101	88
BATCHELOR MACHINE Facility Status: Historical	14439 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.431 mi.)	L102	88
LUJAN'S IRON WORK	14439 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.431 mi.)	L103	88
ARROW FIELD SERVICE Facility Status: Historical	***1580 ARROW HWY***	***NW 1/4 - 1/2 (0.476 mi.)***	***M112***	***95***
CORONET CERAMICS, INC. Facility Status: Historical	14520 JOANBRIDGE ST	ESE 1/4 - 1/2 (0.480 mi.)	P115	99
GOODWAY ELECTRICAL CO. (USA) Facility Status: Historical	14506 ARROW HWY	E 1/4 - 1/2 (0.484 mi.)	R117	100
TENNER CAL CONSTRUCTION Facility Status: Historical	***14530 JOANBRIDGE ST***	***ESE 1/4 - 1/2 (0.493 mi.)***	***P119***	***101***
ABC TEA HOUSE Facility Status: Historical	14520 ARROW HWY	E 1/4 - 1/2 (0.495 mi.)	R120	103
LIVINGSTON-GRAHAM Facility Status: Historical Facility Status: Historical	***13550 LIVE OAK AVE***	***NW 1/4 - 1/2 (0.496 mi.)***	***Q123***	***111***

Lower Elevation	Address	Direction / Distance	Map ID	Page
GUMSHOE ENTERPRISES, INC. Facility Status: Historical	14120 LIVE OAK AVE	SSE 0 - 1/8 (0.106 mi.)	A3	9

EXECUTIVE SUMMARY

Lower Elevation	Address	Direction / Distance	Map ID	Page
SVI INTERNATIONAL, INC. Facility Status: Historical	14120 LIVE OAK AVE	SSE 0 - 1/8 (0.106 mi.)	A4	9
TIME & SOUND CO., INC. Facility Status: Historical	14120 LIVE OAK AVE	SSE 0 - 1/8 (0.106 mi.)	A5	9
TOPTEK TECHNOLOGY, INC. Facility Status: Historical	14140 LIVE OAK AVE	SSE 0 - 1/8 (0.111 mi.)	A6	9
K. S. BROTHER BOX Facility Status: Historical	14140 LIVE OAK AVE	SSE 0 - 1/8 (0.111 mi.)	A7	10
MULTI-DUTI MANUFACTURING, INC.	14140 LIVE OAK AVE	SSE 0 - 1/8 (0.111 mi.)	A8	10
MULTI-DUTI MFG. INC. Facility Status: Historical	14140 LIVE OAK AVE	SSE 0 - 1/8 (0.111 mi.)	A9	10
HYDRODYNE Facility Status: Historical	14140 LIVE OAK AVE	SSE 0 - 1/8 (0.111 mi.)	A10	10
UNITED CONCRETE PIPE CO Facility Status: Historical	***14041 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.139 mi.)***	***C28***	***26***
US PIPE & FOUNDRY CO Facility Status: Backlog	***14005 E LIVE OAK AVE***	***SW 1/8 - 1/4 (0.173 mi.)***	***C41***	***33***
F. M. CLEANING SERV	14138 JOANBRIDGE ST	S 1/8 - 1/4 (0.196 mi.)	E50	38
WEBSTERS REFUSE DISPOSAL	***13940 LIVE OAK***	***WSW 1/4 - 1/2 (0.251 mi.)***	***G66***	***51***
MMC/PHT Facility Status: Historical	5170 COMMERCE DR	WSW 1/4 - 1/2 (0.377 mi.)	I80	75
UNITEX Facility Status: Historical	5175 COMMERCE DR	WSW 1/4 - 1/2 (0.388 mi.)	K81	75
COVENTRY MFG CO INC Facility Status: Historical Facility Status: Historical	***5152 COMMERCE DR***	***WSW 1/4 - 1/2 (0.388 mi.)***	***K82***	***75***
DENOVO Facility Status: Historical	***5130 COMMERCE DR***	***WSW 1/4 - 1/2 (0.389 mi.)***	***K83***	***78***
OCCUPANT	5161 COMMERCE DR	WSW 1/4 - 1/2 (0.403 mi.)	K84	79
SUES, YOUNG & BROWN, INC. Facility Status: Historical	5151 COMMERCE DR	WSW 1/4 - 1/2 (0.420 mi.)	K95	86
GRAPHIC INSTALLATION SERV	5120 COMMERCE DR	SW 1/4 - 1/2 (0.456 mi.)	N107	91
THOMAS &BETTS Facility Status: Historical	13700 LIVE OAK AVE	WSW 1/4 - 1/2 (0.463 mi.)	O109	93
CORDIS WEBSTER INC Facility Status: Historical	***5114 COMMERCE DR***	***SW 1/4 - 1/2 (0.468 mi.)***	***N110***	***93***
OTTING ENTERPRISES Facility Status: Historical	***5104 COMMERCE DR***	***SW 1/4 - 1/2 (0.491 mi.)***	***N118***	***101***

HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency

A review of the HAZNET list, as provided by EDR, and dated 12/31/2007 has revealed that there are 16

HAZNET sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
L. A. CELLULAR	14160 LIVE OAK AVENUE	SE 0 - 1/8 (0.120 mi.)	A11	11
SUNBURST DRAPERY CLEANERS & FI	***14160 LIVE OAK AVE #B***	***SE 0 - 1/8 (0.120 mi.)***	***A13***	***12***
SEMCO LASER TECHNOLOGY CORP	14160 LIVE OAKS AVE UNI	SE 1/8 - 1/4 (0.125 mi.)	A19	17
VALLEY CO WATER DIST	14233 JOANBRIDGE ST	SE 1/8 - 1/4 (0.213 mi.)	F51	38
VALLEY CO WATER DISTRICT	***14233 JOANBRIDGE***	***SE 1/8 - 1/4 (0.213 mi.)***	***F53***	***41***
CLINTON O NIXON FACILITY	14233 JOANBRIDGE ST	SE 1/8 - 1/4 (0.213 mi.)	F56	44
RAY GASKIA	***14312 ARROW HWY***	***ESE 1/8 - 1/4 (0.244 mi.)***	***H60***	***48***
ROYAL OAKS BODY SHOP	***14314 E ARROW HWY***	***ESE 1/8 - 1/4 (0.247 mi.)***	***H64***	***50***

Lower Elevation	Address	Direction / Distance	Map ID	Page
HUGHES MARKETS INC	***5305 RIVERGRADE RD***	***W 1/8 - 1/4 (0.152 mi.)***	***D32***	***28***
TA ASSOCIATES REALITY	5305 RIVERGRADE RD	W 1/8 - 1/4 (0.152 mi.)	D35	31
RYDER TRANSPORTATION	5301 RIVERGRADE RD	W 1/8 - 1/4 (0.166 mi.)	D37	31
THE REALTY ASSOCIATES FUND V L	5301-5305 RIVERGRADE RD	W 1/8 - 1/4 (0.166 mi.)	D39	32
HUGHES MARKETS INC	***14005 LIVE OAK AVE***	***SW 1/8 - 1/4 (0.173 mi.)***	***C46***	***36***
1X HUGHES MARKET	14005 LINEOAK AVENUE	WSW 1/8 - 1/4 (0.174 mi.)	C47	37
WASTE MGMT OF BALDWIN PARK	14129 JOANBRIDGE ST	S 1/8 - 1/4 (0.194 mi.)	E49	38
B AND W PRECISION INC	***13955 LIVE OAK AVE***	***WSW 1/8 - 1/4 (0.216 mi.)***	***G58***	***45***

EMI: Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies

A review of the EMI list, as provided by EDR, and dated 12/31/2006 has revealed that there are 3 EMI sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ROYAL OAKS BODY SHOP	***14314 E ARROW HWY***	***ESE 1/8 - 1/4 (0.247 mi.)***	***H64***	***50***

Lower Elevation	Address	Direction / Distance	Map ID	Page
UNITED CONCRETE PIPE CORPORATI	14041 E LIVE OAK AV	SW 1/8 - 1/4 (0.139 mi.)	C30	27
HUGHES MARKETS INC	***5305 RIVERGRADE RD***	***W 1/8 - 1/4 (0.152 mi.)***	***D32***	***28***

EDR PROPRIETARY RECORDS

EDR Proprietary Records

EDR Historical Auto Stations: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc.

A review of the EDR Historical Auto Stations list, as provided by EDR, has revealed that there is 1 EDR Historical Auto Stations site within approximately 0.5 miles of the target property.

EXECUTIVE SUMMARY

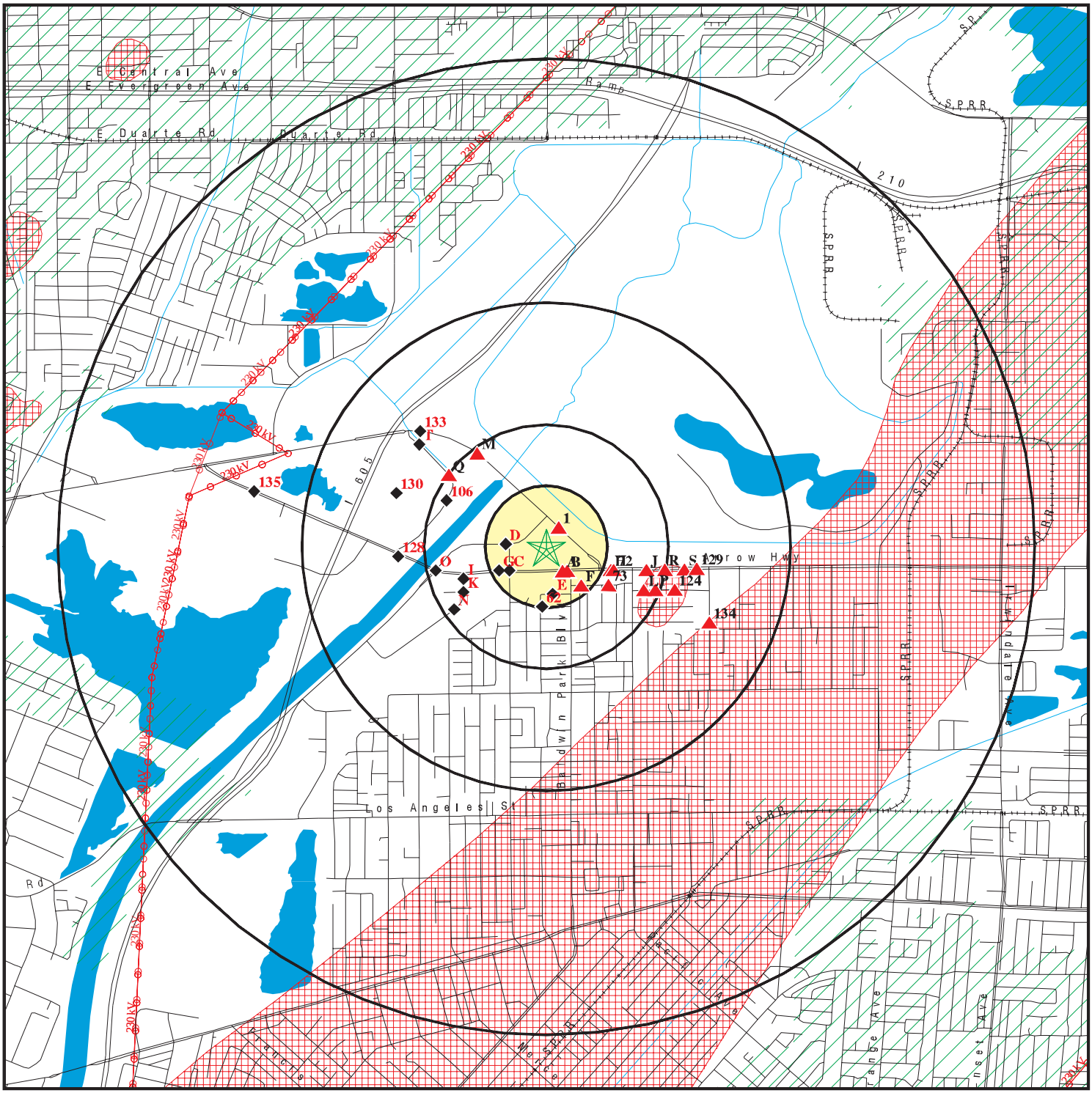
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LOU'S SIGNAL SERVICE	14402 E ARROW HIGHWAY	ESE 1/4 - 1/2 (0.370 mi.)	J77	73

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
UNITED ROCK PRODUCTS CORP	LOS ANGELES CO. HMS, EMI, SWEEPS UST
HOME SAVINGS OF AMERICA	SWEEPS UST
B & B READY MIX	SWEEPS UST
(ALLEY) 5029 MAINE ST	CDL
16223 ARROW HWY BLDG C	CDL
NU-WAY LIVE OAK LANDFILL	HAZNET, SWF/LF, WMUDS/SWAT, WIP, CA WDS
WASHINGTON MUTUAL (SEE 033124)	LUST, LOS ANGELES CO. HMS
MGRDICIAN, JOHN	WMUDS/SWAT
HAROLD SIMPSON GRADING CO DISP	WMUDS/SWAT
VANTHERINE, THEO. L.-IRWINDALE	WMUDS/SWAT
IRWINDALE QUARRY LANDFILL	WMUDS/SWAT, EMI, CA WDS
IRWINDALE SITE	WMUDS/SWAT
IRWINDALE	WMUDS/SWAT
CALTRANS DIST 7	HAZNET
CALTRANS DIST 7/CONSTR/EA07-232604	HAZNET
FRANCISCO AUTO REPAIR	HAZNET
WESTERN MECHANICAL INC	HAZNET
LOS ANGELES COUNTY FIRE DEPT	HAZNET
EXPRESS DISPOSAL/ALL WASTE	HAZNET
INFINITE PHOTO LAB	HAZNET, WIP
AM-MARK LABEL INC	HAZNET
B P AIR INC	HAZNET
LOS ANGELES COUNTY FIRE DEPARTMENT	HAZNET
RTM MACHINING	HAZNET
ACE HARDWARE	HAZNET
TBD	LA Co. Site Mitigation
BOCK MACHINE INC.	WIP
VAN ASCH INC.	WIP
PIT NO. 2 MINE RECLAMATION	CA WDS
ARCO PRODUCTS #09671	LOS ANGELES CO. HMS
EL POLLO BRAVO	LOS ANGELES CO. HMS
JUAN'S SUPER POLLO	LOS ANGELES CO. HMS
THE PRINT SOURCE	LOS ANGELES CO. HMS
WATSON HOG RANCH (DEST)	LOS ANGELES CO. HMS
CIRCLE K	LOS ANGELES CO. HMS
RIVERGRADE SERV. STA. SHELL	LOS ANGELES CO. HMS
ALPINE MILLWORKS MFG	EMI
AL'S FINISHING, ALFREDO CORRAL	EMI
UNITED ROCK PRODUCTS CORP.	EMI
SUNBURST DECORATIVE ROCK INC	EMI
SUNBURST DECORATIVE ROCK INC	EMI

OVERVIEW MAP - 2516447.2s



0 1/2 1 2 Miles

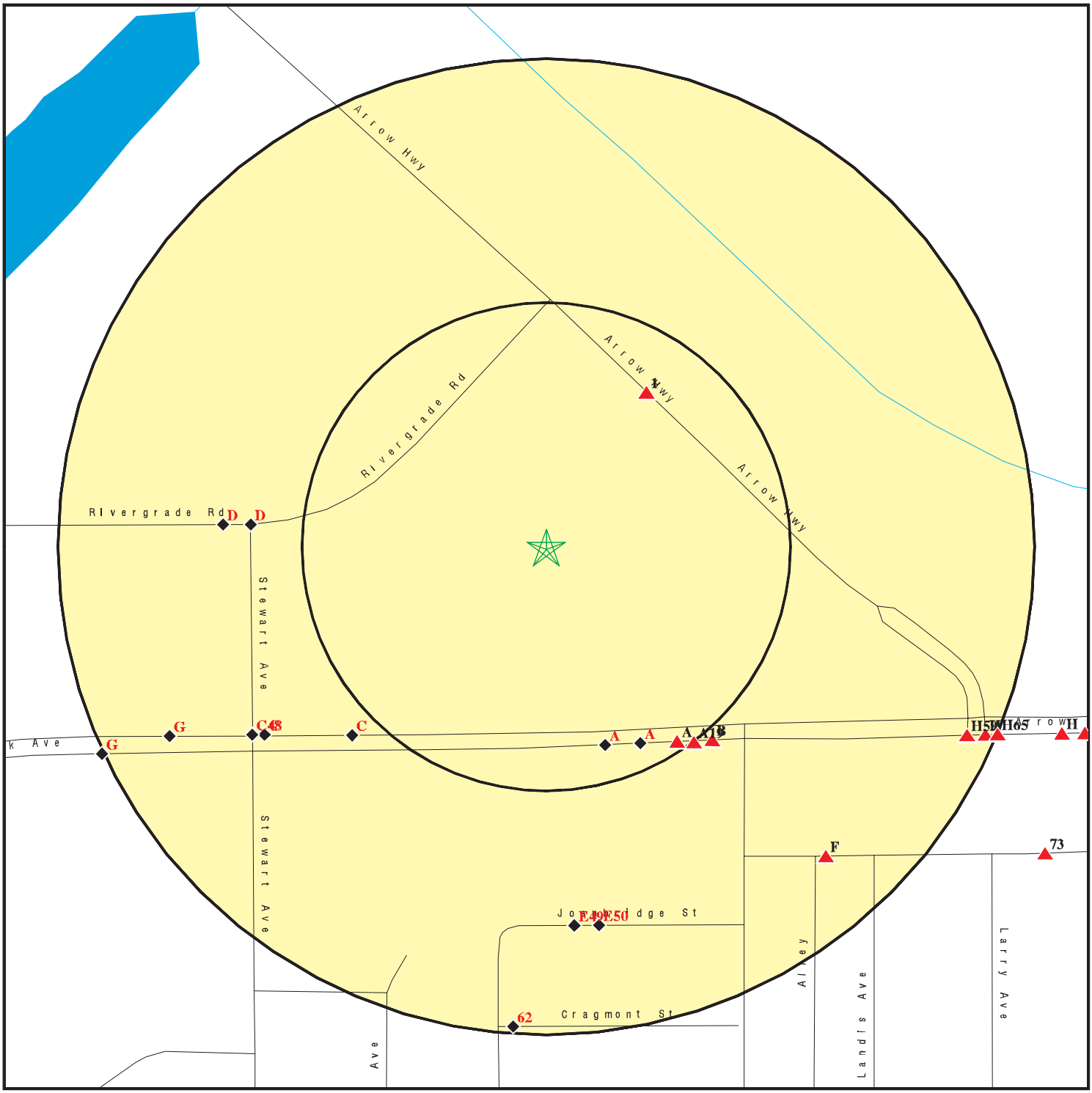
- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 17.5-Acre Vacant Lot	CLIENT: Converse Consultants
ADDRESS: Live Oak Avenue Irwindale CA 91706	CONTACT: Heidi Yavornicky
LAT/LONG: 34.1082 / 117.9667	INQUIRY #: 2516447.2s DATE: June 11, 2009 9:23 am

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DETAIL MAP - 2516447.2s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 17.5-Acre Vacant Lot ADDRESS: Live Oak Avenue Irwindale CA 91706 LAT/LONG: 34.1082 / 117.9667	CLIENT: Converse Consultants CONTACT: Heidi Yavornicky INQUIRY #: 2516447.2s DATE: June 11, 2009 9:23 am

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MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL		1.250	0	0	0	0	0	0
Proposed NPL		1.250	0	0	0	0	0	0
NPL LIENS		0.250	0	0	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL		1.250	0	0	0	0	0	0
Federal CERCLIS list								
CERCLIS		0.750	0	0	0	1	NR	1
Federal CERCLIS NFRAP site List								
CERC-NFRAP		0.750	0	0	0	0	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS		1.250	0	0	0	0	0	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF		0.750	0	0	0	0	NR	0
Federal RCRA generators list								
RCRA-LQG		0.500	0	0	0	NR	NR	0
RCRA-SQG		0.500	0	3	7	NR	NR	10
RCRA-CESQG		0.500	0	0	0	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS		0.750	0	0	0	0	NR	0
US INST CONTROL		0.750	0	0	0	0	NR	0
Federal ERNS list								
ERNS		0.250	0	0	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE		1.250	0	0	0	0	0	0
State- and tribal - equivalent CERCLIS								
AOCONCERN		1.250	0	0	1	0	0	1
ENVIROSTOR		1.250	0	1	0	0	0	1
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF		0.750	0	0	1	3	NR	4
State and tribal leaking storage tank lists								
LUST		0.750	0	2	4	5	NR	11
SLIC		0.750	1	4	0	1	NR	6

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST		0.750	0	0	0	0	NR	0
State and tribal registered storage tank lists								
UST		0.500	0	2	4	NR	NR	6
AST		0.500	0	0	0	NR	NR	0
INDIAN UST		0.500	0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP		0.750	0	0	0	0	NR	0
VCP		0.750	0	0	0	0	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS		0.750	0	0	0	0	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
ODI		0.750	0	0	0	0	NR	0
DEBRIS REGION 9		0.750	0	0	0	0	NR	0
WMUDS/SWAT		0.750	0	0	0	0	NR	0
SWRCY		0.750	0	0	1	1	NR	2
HAULERS		0.250	0	0	NR	NR	NR	0
INDIAN ODI		0.750	0	0	0	0	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL		0.250	0	0	NR	NR	NR	0
HIST Cal-Sites		1.250	0	0	0	0	0	0
SCH		0.500	0	0	0	NR	NR	0
Toxic Pits		1.250	0	0	0	0	0	0
AOCONCERN		1.250	0	0	1	0	0	1
CDL		0.250	0	1	NR	NR	NR	1
Local Lists of Registered Storage Tanks								
CA FID UST		0.500	0	1	3	NR	NR	4
HIST UST		0.500	0	2	5	NR	NR	7
SWEEPS UST		0.500	0	4	7	NR	NR	11
Local Land Records								
LIENS 2		0.250	0	0	NR	NR	NR	0
LUCIS		0.750	0	0	0	0	NR	0
LIENS		0.250	0	0	NR	NR	NR	0
DEED		0.750	0	0	0	0	NR	0
Records of Emergency Release Reports								
HMIRS		0.250	0	1	NR	NR	NR	1
CHMIRS		0.250	1	0	NR	NR	NR	1
LDS		0.250	0	0	NR	NR	NR	0
MCS		0.250	0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Other Ascertainable Records								
RCRA-NonGen		0.500	0	0	1	NR	NR	1
DOT OPS		0.250	0	0	NR	NR	NR	0
DOD		1.250	0	0	0	0	0	0
FUDS		1.250	0	0	0	0	0	0
CONSENT		1.250	0	0	0	0	0	0
ROD		1.250	0	0	0	0	0	0
UMTRA		0.750	0	0	0	0	NR	0
MINES		0.500	0	0	0	NR	NR	0
TRIS		0.250	0	0	NR	NR	NR	0
TSCA		0.250	0	0	NR	NR	NR	0
FTTS		0.250	0	0	NR	NR	NR	0
HIST FTTS		0.250	0	0	NR	NR	NR	0
SSTS		0.250	0	0	NR	NR	NR	0
ICIS		0.250	0	0	NR	NR	NR	0
PADS		0.250	0	0	NR	NR	NR	0
MLTS		0.250	0	0	NR	NR	NR	0
RADINFO		0.250	0	0	NR	NR	NR	0
FINDS		0.250	0	3	NR	NR	NR	3
RAATS		0.250	0	0	NR	NR	NR	0
CA BOND EXP. PLAN		1.250	0	0	0	0	0	0
NPDES		0.250	0	1	NR	NR	NR	1
CA WDS		0.250	0	0	NR	NR	NR	0
Cortese		0.750	0	0	0	0	NR	0
HIST CORTESE		0.500	0	1	3	NR	NR	4
Notify 65		1.250	0	0	0	1	1	2
LA Co. Site Mitigation		0.250	0	1	NR	NR	NR	1
DRYCLEANERS		0.500	1	0	0	NR	NR	1
LOS ANGELES CO. HMS		0.250	0	11	NR	NR	NR	11
WIP		0.500	15	12	35	NR	NR	62
HAZNET		0.250	2	14	NR	NR	NR	16
EMI		0.250	0	3	NR	NR	NR	3
INDIAN RESERV		1.250	0	0	0	0	0	0
SCRD DRYCLEANERS		0.750	0	0	0	0	NR	0
EDR PROPRIETARY RECORDS								
EDR Proprietary Records								
Manufactured Gas Plants		1.250	0	0	0	0	0	0
EDR Historical Auto Stations		0.500	0	0	1	NR	NR	1
EDR Historical Cleaners		0.500	0	0	0	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

ESE
1/4-1/2
2271 ft.

SAN GABRIEL VALLEY
LOS ANGELES (County), CA

Additional polygons located at: SE 3553 ft.

AOCONCERN:
area where VOC contamination is at or above the MCL as designated by region 9 EPA office

Database(s): **AOCONCERN**
EDR ID Number: **CCA0000001**
EPA ID Number: **N/A**

1
NNE
< 1/8
0.094 mi.
497 ft.

ELAINE'S CONTRACTING
14254 ARROW HWY
BALDWIN PARK, CA 91706

Relative:
Higher

Actual:
430 ft.

WIP:

Region:	4
File Number:	108.1043
File Status:	**Historical**
Staff:	RSK
Facility Suite:	Not reported

Database(s): **WIP**
EDR ID Number: **S106766899**
EPA ID Number: **N/A**

A2
SSE
< 1/8
0.106 mi.
558 ft.

14120 LIVE OAK
BALDWIN PARK, CA 91706
Site 1 of 18 in cluster A

Relative:
Lower

Actual:
416 ft.

CHMIRS:

OES Incident Number:	02-3603
OES notification:	7/2/200208:06:02 AM
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
Special Studies 1:	Not reported
Special Studies 2:	Not reported
Special Studies 3:	Not reported
Special Studies 4:	Not reported
Special Studies 5:	Not reported
Special Studies 6:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported

Database(s): **CHMIRS**
EDR ID Number: **S105885189**
EPA ID Number: **N/A**

(Continued) **S105885189**

Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA/DOT/PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Comments:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	No
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Contractor
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2002
Agency:	LA Co. FD
Incident Date:	7/2/200212:00:00 AM
Admin Agency:	L. A. County Fire Prevention
Amount:	Not reported
Contained:	Yes
Site Type:	Merchant/Business
E Date:	Not reported
Substance:	Unknown
Quantity Released:	Not reported
BBLS:	0
Cups:	0
CUFT:	0
Gallons:	55
Grams:	0
Pounds:	0
Liters:	0
Ounces:	0
Pints:	0
Quarts:	0
Sheen:	0
Tons:	0
Unknown:	0
Description:	Not reported
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
Description:	Static situation. NO details available. 55 gallon drum on its side with an unknown chemical substance is blocked in a drain that runs to the street. .

A3 **GUMSHOE ENTERPRISES, INC.** **WIP** **S106767121**
SSE **14120 LIVE OAK AVE** **N/A**
< 1/8 **BALDWIN PARK, CA 91706**
0.106 mi.
558 ft. **Site 2 of 18 in cluster A**

Relative: WIP:
Lower Region: 4
File Number: 108.1380
Actual: **File Status:** **Historical**
416 ft. Staff: DKOO
Facility Suite: B

A4 **SVI INTERNATIONAL, INC.** **WIP** **S106767259**
SSE **14120 LIVE OAK AVE** **N/A**
< 1/8 **IRWINDALE, CA 91706**
0.106 mi.
558 ft. **Site 3 of 18 in cluster A**

Relative: WIP:
Lower Region: 4
File Number: 108.1583
Actual: **File Status:** **Historical**
416 ft. Staff: WLIU
Facility Suite: C&D

A5 **TIME & SOUND CO., INC.** **WIP** **S106767120**
SSE **14120 LIVE OAK AVE** **N/A**
< 1/8 **BALDWIN PARK, CA 91706**
0.106 mi.
558 ft. **Site 4 of 18 in cluster A**

Relative: WIP:
Lower Region: 4
File Number: 108.1379
Actual: **File Status:** **Historical**
416 ft. Staff: WLIU
Facility Suite: B

A6 **TOPTEK TECHNOLOGY, INC.** **WIP** **S106767258**
SSE **14140 LIVE OAK AVE** **N/A**
< 1/8 **IRWINDALE, CA 91706**
0.111 mi.
588 ft. **Site 5 of 18 in cluster A**

Relative: WIP:
Lower Region: 4
File Number: 108.1582
Actual: **File Status:** **Historical**
417 ft. Staff: DKOO
Facility Suite: C

A7
SSE
< 1/8
0.111 mi.
588 ft.

K. S. BROTHER BOX — **WIP** — **S106767125**
14140 LIVE OAK AVE — **N/A**
BALDWIN PARK, CA 91706

Site 6 of 18 in cluster A

Relative:
Lower

Actual:
417 ft.

WIP:
Region: 4
File Number: 108.1385
File Status: Historical
Staff: TB
Facility Suite: C-D

A8
SSE
< 1/8
0.111 mi.
588 ft.

MULTI-DUTI MANUFACTURING, INC. — **WIP** — **S106767123**
14140 LIVE OAK AVE — **N/A**
BALDWIN PARK, CA 91706

Site 7 of 18 in cluster A

Relative:
Lower

Actual:
417 ft.

WIP:
Region: 4
File Number: 108.1382
File Status: Not reported
Staff: UNIDENTIFIED
Facility Suite: A

A9
SSE
< 1/8
0.111 mi.
588 ft.

MULTI-DUTI MFG. INC. — **WIP** — **S106767122**
14140 LIVE OAK AVE — **N/A**
BALDWIN PARK, CA 91706

Site 8 of 18 in cluster A

Relative:
Lower

Actual:
417 ft.

WIP:
Region: 4
File Number: 108.1381
File Status: Historical
Staff: PAR
Facility Suite: A

A10
SSE
< 1/8
0.111 mi.
588 ft.

HYDRODYNE — **WIP** — **S106767124**
14140 LIVE OAK AVE — **N/A**
BALDWIN PARK, CA 91706

Site 9 of 18 in cluster A

Relative:
Lower

Actual:
417 ft.

WIP:
Region: 4
File Number: 108.1383
File Status: Historical
Staff: TB
Facility Suite: B

A11
SE
< 1/8
0.120 mi.
633 ft.

L. A. CELLULAR
14160 LIVE OAK AVENUE
BALDWIN PARK, CA 91706

Site 10 of 18 in cluster A

Relative:
Equal

Actual:
418 ft.

HAZNET **S102801845**
N/A

HAZNET:

Gepaid:	CAC001011336
Contact:	L.A. CELLULAR
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14160 LIVE OAK AVENUE
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAD088504881
TSD County:	Orange
Waste Category:	Alkaline solution (pH <UN-> 12.5) with metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc)
Disposal Method:	Recycler
Tons:	.0750
Facility County:	Los Angeles

Gepaid:	CAC001011336
Contact:	L.A. CELLULAR
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14160 LIVE OAK AVENUE
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAD088504881
TSD County:	Orange
Waste Category:	Other inorganic solid waste
Disposal Method:	Not reported
Tons:	.0500
Facility County:	Los Angeles

A12
SE
< 1/8
0.120 mi.
633 ft.

SEIZMIC INC.
14160 LIVE OAK AVE
BALDWIN PARK, CA 91706

Site 11 of 18 in cluster A

Relative:
Equal

Actual:
418 ft.

WIP **S106767130**
N/A

WIP:

Region:	4
File Number:	108.1391
File Status:	**Historical**
Staff:	TB
Facility Suite:	H

A13
SE
< 1/8
0.120 mi.
633 ft.

SUNBURST DRAPERY CLEANERS & FIREPROOFING
14160 LIVE OAK AVE #B
BALDWIN PARK, CA 91706

Site 12 of 18 in cluster A

HAZNET
DRYCLEANERS
WIP

S103989802
N/A

Relative:
Equal

Actual:
418 ft.

HAZNET:

Gepaid:	CAD981655632
Contact:	SUNBURST DRAPERY CLEANERS &
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14160 LIVE OAK AVE STE B
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAD981397417
TSD County:	Los Angeles
Waste Category:	Not reported
Disposal Method:	Recycler
Tons:	.0000
Facility County:	Los Angeles

Gepaid:	CAD981655632
Contact:	SUNBURST DRAPERY CLEANERS &
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14160 LIVE OAK AVE STE B
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAD981397417
TSD County:	Los Angeles
Waste Category:	Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method:	Recycler
Tons:	1.7273
Facility County:	Los Angeles

Gepaid:	CAD981655632
Contact:	SUNBURST DRAPERY CLEANERS &
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14160 LIVE OAK AVE STE B
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAD981397417
TSD County:	Los Angeles
Waste Category:	Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method:	Recycler
Tons:	.7193
Facility County:	Los Angeles

Gepaid:	CAD981655632
Contact:	MICHAEL WEINREB PRES
Telephone:	6269628778
Facility Addr2:	Not reported
Mailing Name:	Not reported

SUNBURST DRAPERY CLEANERS & FIREPROOFING (Continued) **S103989802**

Mailing Address: 14160 LIVE OAK AVE STE B
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: Not reported
TSD County: Los Angeles
Waste Category: Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method: Not reported
Tons: Not reported
Facility County: Not reported

Gepaid: CAD981655632
Contact: MICHAEL WEINREB PRES
Telephone: 6269628778
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14160 LIVE OAK AVE STE B
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: Not reported
TSD County: Los Angeles
Waste Category: Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method: Transfer Station
Tons: 0.10
Facility County: Not reported

Click this hyperlink while viewing on your computer to access
14 additional CA_HAZNET: record(s) in the EDR Site Report.

CLEANERS:
EPA Id: CAD981655632
NAICS Code: 81232
NAICS Description: Drycleaning and Laundry Services (except Coin-Operated)
SIC Code: 7216
Create Date: 4/10/1987
Facility Active: No
Inactive Date: 6/30/2005 3:01:00 PM
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14160 LIVE OAK AVE STE B
Mailing Address 2: Not reported
Mailing State: CA
Mailing Zip: 917060000
Region Code: 3
Owner Name: SUNBURST DRAPERY CLEANERS &
Owner Address: 14160 LIVE OAK AVE STE B
Owner Address 2: Not reported
Owner Telephone: 0000000000
Contact Name: MICHAEL WEINREB PRES
Contact Address: 14160 LIVE OAK AVE STE B
Contact Address 2: Not reported
Contact Telephone: 6269628778
SIC Description: 7211 Power Laundries, Family and Commercial
SIC Description: 7216 Drycleaning Plants, Except Rug Cleaning
SIC Description: 7219 Laundry and Garment Services, NEC (except diaper service and clothing alteration and repair)

SUNBURST DRAPERY CLEANERS & FIREPROOFING (Continued) **S103989802**

SIC Description: Not reported
SIC Description: 7212 Garment Pressing, and Agents for Laundries and Drycleaners

EPA Id: CAD981655632
NAICS Code: 81232
NAICS Description: Drycleaning and Laundry Services (except Coin-Operated)
SIC Code: 7211
Create Date: 4/10/1987
Facility Active: No
Inactive Date: 6/30/2005 3:01:00 PM
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14160 LIVE OAK AVE STE B
Mailing Address 2: Not reported
Mailing State: CA
Mailing Zip: 917060000
Region Code: 3
Owner Name: SUNBURST DRAPERY CLEANERS &
Owner Address: 14160 LIVE OAK AVE STE B
Owner Address 2: Not reported
Owner Telephone: 0000000000
Contact Name: MICHAEL WEINREB PRES
Contact Address: 14160 LIVE OAK AVE STE B
Contact Address 2: Not reported
Contact Telephone: 6269628778
SIC Description: 7211 Power Laundries, Family and Commercial
SIC Description: 7216 Drycleaning Plants, Except Rug Cleaning
SIC Description: 7219 Laundry and Garment Services, NEC (except diaper service and clothing alteration and repair)
SIC Description: Not reported
SIC Description: 7212 Garment Pressing, and Agents for Laundries and Drycleaners

EPA Id: CAD981655632
NAICS Code: 81232
NAICS Description: Drycleaning and Laundry Services (except Coin-Operated)
SIC Code: 7219
Create Date: 4/10/1987
Facility Active: No
Inactive Date: 6/30/2005 3:01:00 PM
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14160 LIVE OAK AVE STE B
Mailing Address 2: Not reported
Mailing State: CA
Mailing Zip: 917060000
Region Code: 3
Owner Name: SUNBURST DRAPERY CLEANERS &
Owner Address: 14160 LIVE OAK AVE STE B
Owner Address 2: Not reported
Owner Telephone: 0000000000
Contact Name: MICHAEL WEINREB PRES
Contact Address: 14160 LIVE OAK AVE STE B
Contact Address 2: Not reported
Contact Telephone: 6269628778
SIC Description: 7211 Power Laundries, Family and Commercial
SIC Description: 7216 Drycleaning Plants, Except Rug Cleaning
SIC Description: 7219 Laundry and Garment Services, NEC (except diaper service and clothing

SUNBURST DRAPERY CLEANERS & FIREPROOFING (Continued) **S103989802**

alteration and repair)
SIC Description: Not reported
SIC Description: 7212 Garment Pressing, and Agents for Laundries and Drycleaners

EPA Id: CAD981655632
NAICS Code: 81232
NAICS Description: Drycleaning and Laundry Services (except Coin-Operated)
SIC Code: 7212
Create Date: 4/10/1987
Facility Active: No
Inactive Date: 6/30/2005 3:01:00 PM
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14160 LIVE OAK AVE STE B
Mailing Address 2: Not reported
Mailing State: CA
Mailing Zip: 917060000
Region Code: 3
Owner Name: SUNBURST DRAPERY CLEANERS &
Owner Address: 14160 LIVE OAK AVE STE B
Owner Address 2: Not reported
Owner Telephone: 0000000000
Contact Name: MICHAEL WEINREB PRES
Contact Address: 14160 LIVE OAK AVE STE B
Contact Address 2: Not reported
Contact Telephone: 6269628778
SIC Description: 7211 Power Laundries, Family and Commercial
SIC Description: 7216 Drycleaning Plants, Except Rug Cleaning
SIC Description: 7219 Laundry and Garment Services, NEC (except diaper service and clothing alteration and repair)
SIC Description: Not reported
SIC Description: 7212 Garment Pressing, and Agents for Laundries and Drycleaners

WIP:
Region: 4
File Number: 108.1387
File Status: Backlog
Staff: UNIDENTIFIED
Facility Suite: B

A14 **SUNBURST DRAPERY CLEANERS** **SLIC** **S106484713**
SE **14160 LIVE OAK AVE. #B** **N/A**
< 1/8 **BALDWIN PARK, CA 91706**
0.120 mi.
633 ft. **Site 13 of 18 in cluster A**

Relative:
Equal

Actual:
418 ft.

SLIC:
Region: STATE
Facility Status: Open - Site Assessment
Status Date: 1996-04-11 00:00:00
Global Id: SL603798912
Lead Agency: LOS ANGELES RWQCB (REGION 4)
Lead Agency Case Number: Not reported
Latitude: 34.106774
Longitude: -117.964
Case Type: Cleanup Program Site
Case Worker: Not reported

SUNBURST DRAPERY CLEANERS (Continued) **S106484713**

Local Agency: Not reported
RB Case Number: 108.1387
File Location: Not reported
Potential Media Affected: Aquifer used for drinking water supply
Potential Contaminants of Concern: Not reported
Site History: Not reported

A15 **SHELCOMM** **WIP** **S106767127**
SE **14160 LIVE OAK AVE** **N/A**
< 1/8 **BALDWIN PARK, CA 91706**
0.120 mi.
633 ft. **Site 14 of 18 in cluster A**

Relative: **Equal**

Actual: **418 ft.**

WIP:
Region: 4
File Number: 108.1388
File Status: **Historical**
Staff: TB
Facility Suite: C

A16 **TIMES INTERNATIONAL COMPUTERS** **WIP** **S106767129**
SE **14160 LIVE OAK AVE** **N/A**
< 1/8 **BALDWIN PARK, CA 91706**
0.120 mi.
633 ft. **Site 15 of 18 in cluster A**

Relative: **Equal**

Actual: **418 ft.**

WIP:
Region: 4
File Number: 108.1390
File Status: **Historical**
Staff: WLIU
Facility Suite: F

A17 **FULLER & ASSOCIATES** **WIP** **S106767257**
SE **14160 LIVE OAK AVE** **N/A**
< 1/8 **IRWINDALE, CA 91706**
0.120 mi.
633 ft. **Site 16 of 18 in cluster A**

Relative: **Equal**

Actual: **418 ft.**

WIP:
Region: 4
File Number: 108.1581
File Status: **Historical**
Staff: DKOO
Facility Suite: Not reported

A18
SE
< 1/8
0.120 mi.
633 ft.

HART ENTERPRISES
14160 LIVE OAK AVE
BALDWIN PARK, CA 91706

Site 17 of 18 in cluster A

Relative:
Equal

Actual:
418 ft.

WIP **S106767126**
N/A

WIP:

Region:	4
File Number:	108.1386
File Status:	**Historical**
Staff:	TB
Facility Suite:	A

A19
SE
1/8-1/4
0.125 mi.
662 ft.

SEMCO LASER TECHNOLOGY CORP
14160 LIVE OAKS AVE UNIT D
BALDWIN PARK, CA 91706

Site 18 of 18 in cluster A

Relative:
Equal

Actual:
418 ft.

HAZNET **S104582328**
N/A

HAZNET:

Gepaid:	CAL000196322
Contact:	ALBERT TU PRESIDENT
Telephone:	6264727764
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	18007 CORTNEY COURT
Mailing City,St,Zip:	CITY OF INDUSTRY, CA 917480000
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	99
Waste Category:	Laboratory waste chemicals
Disposal Method:	***
Tons:	0.02
Facility County:	Not reported

Gepaid:	CAL000196322
Contact:	ALBERT TU PRESIDENT
Telephone:	6264727764
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	18007 CORTNEY COURT
Mailing City,St,Zip:	CITY OF INDUSTRY, CA 917480000
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	99
Waste Category:	Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method:	***
Tons:	0.12
Facility County:	Not reported

Gepaid:	CAL000196322
Contact:	ALBERT TU PRESIDENT
Telephone:	6264727764
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	18007 CORTNEY COURT
Mailing City,St,Zip:	CITY OF INDUSTRY, CA 917480000
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	Los Angeles

SEMCO LASER TECHNOLOGY CORP (Continued) **S104582328**

Waste Category:	Liquids with pH <UN-> 2
Disposal Method:	Recycler
Tons:	0.12
Facility County:	Not reported
Gepaid:	CAL000196322
Contact:	SEMCO LASER TECHNOLOGY CORP
Telephone:	6264727764
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14160 LIVE OAKS AVE UNIT D
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	TND000772186
TSD County:	0
Waste Category:	Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method:	Disposal, Other
Tons:	0.09
Facility County:	Los Angeles
Gepaid:	CAL000196322
Contact:	SEMCO LASER TECHNOLOGY CORP
Telephone:	6264727764
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14160 LIVE OAKS AVE UNIT D
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	TND000772186
TSD County:	99
Waste Category:	Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method:	Disposal, Other
Tons:	.2502
Facility County:	Los Angeles

Click this hyperlink while viewing on your computer to access
2 additional CA_HAZNET: record(s) in the EDR Site Report.

B20 **INTEGRATED COMPUTER SERVICE** **WIP** **S106767256**
SE **14180 LIVE OAK AVE** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.130 mi.
688 ft. **Site 1 of 5 in cluster B**

Relative:
Higher

Actual:
419 ft.

WIP:

Region:	4
File Number:	108.1580
File Status:	**Historical**
Staff:	TB
Facility Suite:	B

B21 **SEIZMIC INC.** **WIP** **S107257207**
SE **14180 LIVE OAK AVE** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.130 mi.
688 ft. **Site 2 of 5 in cluster B**

Relative: WIP:
Higher Region: 4
File Number: 108.1393
Actual: **File Status:** **Not reported**
419 ft. Staff: UNIDENTIFIED
Facility Suite: I & J

B22 **J & B REFRIGERATION INC.** **WIP** **S106767133**
SE **14180 LIVE OAK AVE** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.130 mi.
688 ft. **Site 3 of 5 in cluster B**

Relative: WIP:
Higher Region: 4
File Number: 108.1395
Actual: **File Status:** **Historical**
419 ft. Staff: TB
Facility Suite: H

B23 **STENO-AIDE, INC.** **WIP** **S106767134**
SE **14180 LIVE OAK AVE** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.130 mi.
688 ft. **Site 4 of 5 in cluster B**

Relative: WIP:
Higher Region: 4
File Number: 108.1397
Actual: **File Status:** **Historical**
419 ft. Staff: DKOO
Facility Suite: C-D

B24 **CERA, INC.** **WIP** **S106767132**
SE **14180 LIVE OAK AVE** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.130 mi.
688 ft. **Site 5 of 5 in cluster B**

Relative: WIP:
Higher Region: 4
File Number: 108.1394
Actual: **File Status:** **Not reported**
419 ft. Staff: UNIDENTIFIED
Facility Suite: F

C25
SW
1/8-1/4
0.138 mi.
727 ft.

UNITED CONCRETE PIPE CORP
14041 E LIVE OAK AVE
BALDWIN PARK, CA 91706

Site 1 of 15 in cluster C

RCRA-SQG: 1000399388
FINDS: CAD982523425
LUST
ENVIROSTOR
HIST CORTESE

Relative:
Lower

Actual:
412 ft.

RCRA-SQG:

Date form received by agency:	09/01/1996
Facility name:	UNITED CONCRETE PIPE CORP
Facility address:	14041 E LIVE OAK AVE BALDWIN PARK, CA 91706
EPA ID:	CAD982523425
Mailing address:	PO BOX 429 BALDWIN PARK, CA 91706
Contact:	Not reported
Contact address:	Not reported Not reported
Contact country:	Not reported
Contact telephone:	Not reported
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	UNITED CONCRETE PIPE
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	Unknown
Mixed waste (haz. and radioactive):	Unknown
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	Unknown
Furnace exemption:	Unknown

UNITED CONCRETE PIPE CORP (Continued) **1000399388**

Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Historical Generators:
Date form received by agency: 06/02/1989
Facility name: UNITED CONCRETE PIPE CORP
Classification: Large Quantity Generator

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110001153126

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

LUST:
Region: STATE
Global Id: T0603702722
Latitude: 34.1068262
Longitude: -117.9683651
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 1994-11-03 00:00:00
Lead Agency: LOS ANGELES RWQCB (REGION 4)
Case Worker: Not reported
Local Agency: LOS ANGELES COUNTY
RB Case Number: I-00593A
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Soil
Potential Contaminats of Concern: Waste Oil / Motor / Hydraulic / Lubricating
Site History: Not reported

LUST REG 4:
Region: 4
Regional Board: 04
County: Los Angeles
facid: I-00593A
Status: Case Closed
Substance: Waste Oil
Substance Quantity: Not reported
Local Case No: Not reported

UNITED CONCRETE PIPE CORP (Continued) **1000399388**

Case Type:	Soil	
Abatement Method Used at the Site:		Not reported
Global ID:	T0603702722	
W Global ID:	Not reported	
Staff:	DK	
Local Agency:	19000	
Cross Street:	STEWART AVE	
Enforcement Type:	Not reported	
Date Leak Discovered:	12/5/1989	
Date Leak First Reported:		12/5/1989
Date Leak Record Entered:	5/22/1990	
Date Confirmation Began:	Not reported	
Date Leak Stopped:	12/5/1989	
Date Case Last Changed on Database:		7/14/2000
Date the Case was Closed:		11/3/1994
How Leak Discovered:	Tank Closure	
How Leak Stopped:	Not reported	
Cause of Leak:	UNK	
Leak Source:	UNK	
Operator:	RICHARDSON, BILL	
Water System:	Not reported	
Well Name:	Not reported	
Approx. Dist To Production Well (ft):		1179.6993388901177505289907 47
Source of Cleanup Funding:		UNK
Preliminary Site Assessment Workplan Submitted:		Not reported
Preliminary Site Assessment Began:		3/1/1990
Pollution Characterization Began:		Not reported
Remediation Plan Submitted:		Not reported
Remedial Action Underway:		Not reported
Post Remedial Action Monitoring Began:		Not reported
Enforcement Action Date:		Not reported
Historical Max MTBE Date:		Not reported
Hist Max MTBE Conc in Groundwater:		Not reported
Hist Max MTBE Conc in Soil:		Not reported
Significant Interim Remedial Action Taken:		Not reported
GW Qualifier:	Not reported	
Soil Qualifier:	Not reported	
Organization:	Not reported	
Owner Contact:	Not reported	
Responsible Party:	WOHL PROPERTY GROUP	
RP Address:	30200 RANCHO VIEJO RD., STE. C,SAN JUAN CAPISTRANO, CA 92675	
Program:	LUST	
Lat/Long:	34.1068262 / -1	
Local Agency Staff:	Not reported	
Beneficial Use:	Not reported	
Priority:	LOP/HIGH - ADMINISTRATIVE (CLOSURE/SB2004/ENFORCEMENT)	
Cleanup Fund Id:	Not reported	
Suspended:	Not reported	
Assigned Name:	Not reported	
Summary:	NO FURTHER ACTION IS REQUIRED BY LADPW; OLD CASE #052390-06; NFA ISSUED BY WIP 11/3/94	

ENVIROSTOR:

Site Type:	Historical
Site Type Detailed:	* Historical
Acres:	0
NPL:	NO

UNITED CONCRETE PIPE CORP (Continued) **1000399388**

Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: * MMONROY
Division Branch: Chatsworth
Facility ID: 19320196
Site Code: 300257
Assembly: 57
Senate: 24
Special Program: Not reported
Status: No Further Action
Status Date: 1990-09-10 00:00:00
Restricted Use: NO
Funding: Not reported
Latitude: 34.1066506024096
Longitude: -117.968475
Alias Name: 19320196
Alias Type: Envirostor ID Number
Alias Name: CAD982523425
Alias Type: EPA Identification Number
Alias Name: 300257
Alias Type: Project Code (Site Code)

APN: NONE SPECIFIED
APN Description: Not reported
Comments: DATABASE VERIFICATION PROJECT CONFIRMS NFA FOR DTSC.PRELIM ASSESS DONE PRELIMINARY ENDAGERMENT ASSESSMENT COMPLETED WITH AN NFA DESIGNATION. THIS SITE WAS GIVEN AN NFA BASED ON LACK OF SIGNIFICANT HAZARDOUS CONSTITUENTS IN THE SOIL. MINERAL OIL WAS THE PRIMARY CONTAMINANT IN THE SOIL WHICH IS NOTCONSI- DERED TO BE HAZARDOUS. THE SITE MANUFACTURED LARGE CONCRETE PIPE- SECTIONS TO BE USED FOR PIPE LINES AND SEWERS.

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 1994-10-27 00:00:00

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 1990-06-22 00:00:00

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 1990-06-22 00:00:00

Confirmed: 31000
Confirmed Description: No Contami
Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Media Affected: SOIL
Media Affected Desc: Soil

UNITED CONCRETE PIPE CORP (Continued) **1000399388**

Management:
- Management Required: NONE SPECIFIED
- Management Required Desc: Not reported
- Potential: NONE SPECIFIED,31000
- Potenital Description: Not reported
- Potenital Description: No Contami
- Schedule Area Name: Not reported
- Schedule Sub Area Name: Not reported
- Schedule Document Type: Not reported
- Schedule Due Date: Not reported
- Schedule Revised Date: Not reported
- PastUse: NONE

CORTESE:
- Region: CORTESE
- Facility County Code: 19
- Reg By: LTNKA
- Reg Id: I-00593A

C26 **UNITED CONCRETE PIPE** **HIST UST** **U001568833**
SW **14041 LIVE OAK AVE** **N/A**
1/8-1/4 **IRWINDALE, CA 91708**
0.139 mi.
733 ft. **Site 2 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

HIST UST:
- Region: STATE
- Facility ID: 00000041192
- Facility Type: Other
- Other Type: MANUFACTURING PLANT
- Total Tanks: 0007
- Contact Name: D.H. WADLEY-PLANT MANAGER
- Telephone: 8183371211
- Owner Name: UNITED CONCRETE PIPE DIVISION-
- Owner Address: 14041 EAST LIVE OAK
- Owner City,St,Zip: IRWINDALE, CA 91708

- Tank Num: 001
- Container Num: 1
- Year Installed: 1969
- Tank Capacity: 00010000
- Tank Used for: Not reported
- Type of Fuel: Not reported
- Tank Construction: Not reported
- Leak Detection: Visual

- Tank Num: 002
- Container Num: 2
- Year Installed: 1974
- Tank Capacity: 00010000
- Tank Used for: Not reported
- Type of Fuel: Not reported
- Tank Construction: Not reported
- Leak Detection: Visual

- Tank Num: 003
- Container Num: 3

UNITED CONCRETE PIPE (Continued) **U001568833**

Year Installed: 1974
Tank Capacity: 00010000
Tank Used for: Not reported
Type of Fuel: Not reported
Tank Construction: Not reported
Leak Detection: Visual

Tank Num: 004
Container Num: 4
Year Installed: 1979
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Tank Construction: Not reported
Leak Detection: Visual

Tank Num: 005
Container Num: 5
Year Installed: 1940
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Tank Construction: Not reported
Leak Detection: Visual

Tank Num: 006
Container Num: 6
Year Installed: 1940
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Tank Construction: Not reported
Leak Detection: Visual

Tank Num: 007
Container Num: 7
Year Installed: Not reported
Tank Capacity: 00001000
Tank Used for: Not reported
Type of Fuel: Not reported
Tank Construction: Not reported
Leak Detection: Visual

C27 **KOLL BUSINESS** **SLIC** **S102002418**
SW **14041 LIVE OAK** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.139 mi.
733 ft. **Site 3 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

SLIC:
Region: 4
Facility Status: No further action required
SLIC: 0516
Substance: TPH
Staff: Manjulika Chakarbarti

C28 **UNITED CONCRETE PIPE CO** **LA Co. Site Mitigation** **S103697072**
SW **14041 E LIVE OAK AVE** **WIP** **N/A**
1/8-1/4 **IRWINDALE, CA 91706** **SWEEPS UST**
0.139 mi.
733 ft. **Site 4 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

LA Co. Site Mitigation:
Facility ID: Not reported
Site ID: SD0010386
Case ID: RO0000567
Abated: Yes
Assigned To: LR
Entered Date: 05/11/2004
Abated Date: 05/01/1991

WIP:
Region: 4
File Number: 108.1643
File Status: Historical
Staff: DRASMUSS
Facility Suite: Not reported

SWEEPS UST:
Status: A
Comp Number: 593
Number: 9
Board Of Equalization: 44-007462
Ref Date: 07-01-91
Act Date: 07-01-91
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-000593-000001
Actv Date: 06-30-89
Capacity: Not reported
Tank Use: UNKNOWN
Stg: W
Content: Not reported
Number Of Tanks: 3

Status: A
Comp Number: 593
Number: 9
Board Of Equalization: 44-007462
Ref Date: 07-01-91
Act Date: 07-01-91
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-000593-000002
Actv Date: 06-30-89
Capacity: Not reported
Tank Use: UNKNOWN
Stg: W
Content: Not reported
Number Of Tanks: Not reported

Status: A

UNITED CONCRETE PIPE CO (Continued) **S103697072**

Comp Number:	593
Number:	9
Board Of Equalization:	44-007462
Ref Date:	07-01-91
Act Date:	07-01-91
Created Date:	06-30-89
Tank Status:	A
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-000593-000003
Actv Date:	06-30-89
Capacity:	Not reported
Tank Use:	UNKNOWN
Stg:	W
Content:	Not reported
Number Of Tanks:	Not reported

C29 **KOLL BUSINESS** **SLIC** **S106485607**
SW **14041 E. LIVE OAK AVE** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.139 mi.
733 ft. **Site 5 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

SLIC:

Region:	STATE
Facility Status:	**Open**
Status Date:	1965-01-01 00:00:00
Global Id:	SLT43331329
Lead Agency:	LOS ANGELES RWQCB (REGION 4)
Lead Agency Case Number:	Not reported
Latitude:	34.1134405094578
Longitude:	-117.964745022699
Case Type:	Cleanup Program Site
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	0516
File Location:	Not reported
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	Not reported

C30 **UNITED CONCRETE PIPE CORPORATI** **EMI** **S106841717**
SW **14041 E LIVE OAK AV** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.139 mi.
733 ft. **Site 6 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

EMI:

Year:	1987
County Code:	19
Air Basin:	SC
Facility ID:	10823
Air District Name:	SC
SIC Code:	3312
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported

UNITED CONCRETE PIPE CORPORATI (Continued) **S106841717**

Total Organic Hydrocarbon Gases Tons/Yr:	6
Reactive Organic Gases Tons/Yr:	5
Carbon Monoxide Emissions Tons/Yr:	25
NOX - Oxides of Nitrogen Tons/Yr:	14
SOX - Oxides of Sulphur Tons/Yr:	1
Particulate Matter Tons/Yr:	5
Part. Matter 10 Micrometers & Smllr Tons/Yr:	5

D31 **THE REALTY ASSOCIATES FUND VLP** **LUST** **S106915990**
West **5305 NORTH RIVERGRADE RD** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.152 mi.
802 ft. **Site 1 of 9 in cluster D**

Relative:
Lower

Actual:
414 ft.

LUST:

Region:	STATE
Global Id:	T0603752450
Latitude:	0
Longitude:	0
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	2007-03-05 00:00:00
Lead Agency:	LOS ANGELES COUNTY
Case Worker:	Not reported
Local Agency:	LOS ANGELES COUNTY
RB Case Number:	Not reported
LOC Case Number:	ll413068
File Location:	Local Agency
Potential Media Affect:	Under Investigation
Potential Contaminats of Concern:	Gasoline
Site History:	Not reported

D32 **HUGHES MARKETS INC** **HAZNET** **U003064952**
West **5305 RIVERGRADE RD** **EMI** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.152 mi.
802 ft. **Site 2 of 9 in cluster D**

Relative:
Lower

Actual:
414 ft.

HAZNET:

Gepaid:	CAL000107820
Contact:	HUGHES MARKETS
Telephone:	8188566580
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14005 LIVE OAK AVE
Mailing City,St,Zip:	IRWINDALE, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAT000613976
TSD County:	Orange
Waste Category:	Photochemicals/photoprocessing waste
Disposal Method:	Transfer Station
Tons:	.0625
Facility County:	Los Angeles

Gepaid:	CAL000107820
Contact:	HUGHES MARKETS

HUGHES MARKETS INC (Continued) **U003064952**

Telephone: 8188566580
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14005 LIVE OAK AVE
Mailing City,St,Zip: IRWINDALE, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD981402522
TSD County: Kern
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Tons: .1251
Facility County: Los Angeles

Gepaid: CAL000107820
Contact: HUGHES MARKETS
Telephone: 8188566580
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14005 LIVE OAK AVE
Mailing City,St,Zip: IRWINDALE, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAT000613893
TSD County: Los Angeles
Waste Category: Liquids with halogenated organic compounds > 1000 mg/l
Disposal Method: Not reported
Tons: .0000
Facility County: Los Angeles

Gepaid: CAL000107820
Contact: HUGHES MARKETS
Telephone: 8188566580
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14005 LIVE OAK AVE
Mailing City,St,Zip: IRWINDALE, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAT000613893
TSD County: Los Angeles
Waste Category: Liquids with halogenated organic compounds > 1000 mg/l
Disposal Method: Transfer Station
Tons: .1950
Facility County: Los Angeles

Click this hyperlink while viewing on your computer to access
-1 additional CA_HAZNET: record(s) in the EDR Site Report.

EMI:
Year: 1996
County Code: 19
Air Basin: SC
Facility ID: 94218
Air District Name: SC
SIC Code: 5411
Air District Name: SOUTH COAST AQMD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 0

HUGHES MARKETS INC (Continued) **U003064952**

Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

D33 **THE REALTY ASSOCIATES FUND VLP** **LOS ANGELES CO. HMS** **S106024844**
West **5305 N RIVERGRADE RD** **N/A**
1/8-1/4 **IRWINDALE, CA**
0.152 mi.
802 ft. **Site 3 of 9 in cluster D**

Relative:
Lower

Actual:
414 ft.

LOS ANGELES CO. HMS:

Region:	LA
Facility Id:	015636-038518
Facility Status:	OPEN
Area:	3S
Permit Number:	Not reported
Permit Status:	Not reported
Facility Type:	Not reported

Region:	LA
Facility Id:	015636-038592
Facility Status:	Removed
Area:	3S
Permit Number:	373088
Permit Status:	Removed
Facility Type:	T1

D34 **HUGHES MARKETS INC** **LOS ANGELES CO. HMS** **S106024843**
West **5305 N RIVERGRADE RD** **N/A**
1/8-1/4 **IRWINDALE, CA**
0.152 mi.
802 ft. **Site 4 of 9 in cluster D**

Relative:
Lower

Actual:
414 ft.

LOS ANGELES CO. HMS:

Region:	LA
Facility Id:	015636-I17061
Facility Status:	Closed
Area:	3S
Permit Number:	13214
Permit Status:	Closed
Facility Type:	I01

D35 **TA ASSOCIATES REALITY** **HAZNET** **S107142390**
West **5305 RIVERGRADE RD** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.152 mi.
802 ft. **Site 5 of 9 in cluster D**

Relative:
Lower

Actual:
414 ft.

HAZNET:

Gepaid:	CAC002568008
Contact:	WILLIAM SCHRAMM/URS CORPORATION
Telephone:	7144337618
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	2020 E 1ST ST #400
Mailing City,St,Zip:	SANTA ANA, CA 92705
Gen County:	Los Angeles
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Waste oil and mixed oil
Disposal Method:	Recycler
Tons:	3.12
Facility County:	Los Angeles

D36 **RALPHS GROCERY CO** **LOS ANGELES CO. HMS** **S106024847**
West **5305 N RIVERGRADE RD** **N/A**
1/8-1/4 **IRWINDALE, CA**
0.152 mi.
802 ft. **Site 6 of 9 in cluster D**

Relative:
Lower

Actual:
414 ft.

LOS ANGELES CO. HMS:

Region:	LA
Facility Id:	015636-036590
Facility Status:	OPEN
Area:	3S
Permit Number:	Not reported
Permit Status:	Not reported
Facility Type:	Not reported

Region:	LA
Facility Id:	015636-026221
Facility Status:	Permit
Area:	3S
Permit Number:	302135
Permit Status:	Suspended
Facility Type:	I01

D37 **RYDER TRANSPORTATION** **HAZNET** **S106092258**
West **5301 RIVERGRADE RD** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.166 mi.
877 ft. **Site 7 of 9 in cluster D**

Relative:
Lower

Actual:
414 ft.

HAZNET:

Gepaid:	CAL000225169
Contact:	PAUL PERKINS
Telephone:	2134942671
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	5301 RIVERGRADE RD

RYDER TRANSPORTATION (Continued) **S106092258**

Mailing City,St,Zip: IRWINDALE, CA 917060000
Gen County: Los Angeles
TSD EPA ID: Not reported
TSD County: San Bernardino
Waste Category: Waste oil and mixed oil
Disposal Method: Transfer Station
Tons: 0.90
Facility County: Not reported

D38 **TANIMURA DISTRIBUTING INC** **LOS ANGELES CO. HMS** **S108936491**
West **5301 N RIVERGRADE RD** **N/A**
1/8-1/4 **IRWINDALE, CA**
0.166 mi.
877 ft. **Site 8 of 9 in cluster D**

Relative:
Lower

Actual:
414 ft.

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 031856-050173
Facility Status: Permit
Area: 3S
Permit Number: 564344
Permit Status: Permit
Facility Type: I01

D39 **THE REALTY ASSOCIATES FUND V LP C/C WOHL MANAGEMEN** **HAZNET** **S109432529**
West **5301-5305 RIVERGRADE RD** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.166 mi.
877 ft. **Site 9 of 9 in cluster D**

Relative:
Lower

Actual:
414 ft.

HAZNET:
Gepaid: CAL000319798
Contact: KATRINA SNYDER-MANAGER
Telephone: 9496080846
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 2828 E FOOTHILL BLVD STE 201
Mailing City,St,Zip: PASADENA, CA 911073402
Gen County: Los Angeles
TSD EPA ID: ARD981057870
TSD County: 99
Waste Category: Waste oil and mixed oil
Disposal Method: H061
Tons: 1
Facility County: Los Angeles

C40
SW
1/8-1/4
0.173 mi.
914 ft.

HUGHES MARKETS
14005 E. LIVE OAK AVE.
IRWINDALE, CA 91706

Site 7 of 15 in cluster C

Relative:
Lower

Actual:
412 ft.

SLIC **S106484719**
N/A

SLIC:

Region:	STATE
Facility Status:	**Open - Site Assessment**
Status Date:	1989-09-29 00:00:00
Global Id:	SL603798920
Lead Agency:	LOS ANGELES RWQCB (REGION 4)
Lead Agency Case Number:	Not reported
Latitude:	34.1134405094578
Longitude:	-117.964745022699
Case Type:	Cleanup Program Site
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	108.1711
File Location:	Not reported
Potential Media Affected:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Not reported
Site History:	Not reported

C41
SW
1/8-1/4
0.173 mi.
914 ft.

US PIPE & FOUNDRY CO
14005 E LIVE OAK AVE
IRWINDALE, CA

Site 8 of 15 in cluster C

Relative:
Lower

Actual:
412 ft.

LOS ANGELES CO. HMS **S104537597**
WIP **N/A**

LOS ANGELES CO. HMS:

Region:	LA
Facility Id:	000590-I00593
Facility Status:	Closed
Area:	3S
Permit Number:	99047
Permit Status:	Closed
Facility Type:	I04

Region:	LA
Facility Id:	000590-000593
Facility Status:	Removed
Area:	3S
Permit Number:	00000157T
Permit Status:	Removed
Facility Type:	T0

Region:	LA
Facility Id:	015425-I16728
Facility Status:	Closed
Area:	3S
Permit Number:	13048
Permit Status:	Closed
Facility Type:	I01

WIP:

Region:	4
File Number:	108.1711
File Status:	**Backlog**

US PIPE & FOUNDRY CO (Continued) **S104537597**

Staff: UNIDENTIFIED
Facility Suite: Not reported

C42 **THE REALTY ASSOCIATES FUND** **LOS ANGELES CO. HMS** **S104827572**
SW **14005 E LIVE OAK AVE** **N/A**
1/8-1/4 **IRWINDALE, CA**
0.173 mi.
914 ft. **Site 9 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 015425-035756
Facility Status: Removed
Area: 3S
Permit Number: 301297
Permit Status: Removed
Facility Type: I01

C43 **HUGHES MARKET INC** **UST** **U004049227**
SW **14005 LIVE OAK AVE** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.173 mi.
914 ft. **Site 10 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

UST:
Global ID: 1958
Latitude: 34.10681
Longitude: -117.96909

C44 **HUGHES FAMILY MARKETS INC** **RCRA-SQG** **1001111654**
SW **14005 LIVE OAK** **FINDS** **CAR000011916**
1/8-1/4 **IRWINDALE, CA 91706**
0.173 mi.
914 ft. **Site 11 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

RCRA-SQG:
Date form received by agency: 04/29/1996
Facility name: HUGHES FAMILY MARKETS INC
Facility address: 14005 LIVE OAK
IRWINDALE, CA 91706
EPA ID: CAR000011916
Mailing address: PO BOX 7870
IRWINDALE, CA 917067870
Contact: ROSEANN MCLAREN
Contact address: 14005 LIVE OAK
IRWINDALE, CA 91706
Contact country: US
Contact telephone: (818) 856-6580
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of

HUGHES FAMILY MARKETS INC (Continued) **1001111654**

hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: HUGHES FAMILY MARKETS INC
Owner/operator address: PO BOX 7870
IRWINDALE, CA 91706
Owner/operator country: Not reported
Owner/operator telephone: (818) 856-6580
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: Unknown
Mixed waste (haz. and radioactive): Unknown
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: Unknown
Furnace exemption: Unknown
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002911813

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

C45 **HUGHES MARKET (SEE FN 038592)** **LOS ANGELES CO. HMS** **S104827573**
SW **14005 E LIVE OAK AVE** **N/A**
1/8-1/4 **IRWINDALE, CA**
0.173 mi.
914 ft. **Site 12 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 015425-016787
Facility Status: Removed
Area: 3S

HUGHES MARKET (SEE FN 038592) (Continued) **S104827573**

Permit Number: 00006298T
Permit Status: Removed
Facility Type: T0

C46 **HUGHES MARKETS INC** **HAZNET** **S103983560**
SW **14005 LIVE OAK AVE** **LOS ANGELES CO. HMS** **N/A**
1/8-1/4 **IRWINDALE, CA 91706** **SWEEPS UST**
0.173 mi.
914 ft. **Site 13 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

HAZNET:
Gepaid: CAL000098166
Contact: HUGHES MARKETS INC
Telephone: 3108849000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 2201 S WILMINGTON AVE
Mailing City,St,Zip: COMPTON, CA 902201300
Gen County: Los Angeles
TSD EPA ID: CAD981696420
TSD County: Los Angeles
Waste Category: Aqueous solution with less than 10% total organic residues
Disposal Method: Transfer Station
Tons: .2293
Facility County: Los Angeles

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 015425-025828
Facility Status: Closed
Area: 3S
Permit Number: 220117
Permit Status: Closed
Facility Type: I02

SWEEPS UST:
Status: A
Comp Number: 16787
Number: 1
Board Of Equalization: 44-017952
Ref Date: 03-23-92
Act Date: 08-11-92
Created Date: 08-11-92
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-016787-000001
Actv Date: 03-23-92
Capacity: 12000
Tank Use: M.V. FUEL
Stg: P
Content: REG UNLEADED
Number Of Tanks: 3

Status: A
Comp Number: 16787
Number: 1
Board Of Equalization: 44-017952

HUGHES MARKETS INC (Continued) **S103983560**

Ref Date:	03-23-92
Act Date:	08-11-92
Created Date:	08-11-92
Tank Status:	A
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-016787-000002
Actv Date:	03-23-92
Capacity:	12000
Tank Use:	M.V. FUEL
Stg:	P
Content:	DIESEL
Number Of Tanks:	Not reported

Status:	A
Comp Number:	16787
Number:	1
Board Of Equalization:	44-017952
Ref Date:	03-23-92
Act Date:	08-11-92
Created Date:	08-11-92
Tank Status:	A
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-016787-000003
Actv Date:	03-23-92
Capacity:	12000
Tank Use:	M.V. FUEL
Stg:	P
Content:	DIESEL
Number Of Tanks:	Not reported

C47 **1X HUGHES MARKET** **HAZNET** **S100926868**
WSW **14005 LINEOAK AVENUE** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.174 mi.
916 ft. **Site 14 of 15 in cluster C**

Relative:
Lower

Actual:
412 ft.

HAZNET:

Gepaid:	CAC000750832
Contact:	HUGHES MARKET
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14005 LINEOAK AVENUE
Mailing City,St,Zip:	IRWINDALE, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	OKD089761290
TSD County:	99
Waste Category:	Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method:	Not reported
Tons:	.1251
Facility County:	Los Angeles

C48 **HMIRS** **95050581**
WSW **LIVE OAK @ ARROW HWY** **N/A**
1/8-1/4 **IRWINDALE, CA**
0.179 mi.
944 ft. **Site 15 of 15 in cluster C**

Relative: **Lower**

Click this hyperlink while viewing on your computer to access additional HMIRS detail in the EDR Site Report.

Actual: **411 ft.**

E49 **WASTE MGMT OF BALDWIN PARK** **HAZNET** **S108757769**
South **14129 JOANBRIDGE ST** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.194 mi.
1027 ft. **Site 1 of 2 in cluster E**

Relative: **Lower**

Actual: **411 ft.**

HAZNET:

Gepaid:	CAC002599414
Contact:	ALFRED CRUZ
Telephone:	6268561204
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	13940 LIVE OAK AVE
Mailing City,St,Zip:	BALDWIN PARK, CA 91706
Gen County:	Los Angeles
TSD EPA ID:	CAT080033681
TSD County:	Los Angeles
Waste Category:	Other organic solids
Disposal Method:	Recycler
Tons:	0.07
Facility County:	Los Angeles

E50 **F. M. CLEANING SERV** **WIP** **S106767089**
South **14138 JOANBRIDGE ST** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.196 mi.
1032 ft. **Site 2 of 2 in cluster E**

Relative: **Lower**

Actual: **411 ft.**

WIP:

Region:	4
File Number:	108.1332
File Status:	**Not reported**
Staff:	UNIDENTIFIED
Facility Suite:	Not reported

F51 **VALLEY CO WATER DIST** **HAZNET** **1000283293**
SE **14233 JOANBRIDGE ST** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.213 mi.
1126 ft. **Site 1 of 6 in cluster F**

Relative: **Equal**

Actual: **418 ft.**

HAZNET:

Gepaid:	CAD981623473
Contact:	VALLEY COUNTRY WATER DISTRICT
Telephone:	8183387301
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14521 RAMONA BLVD

VALLEY CO WATER DIST (Continued) **1000283293**

Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD009452708
TSD County: 0
Waste Category: Tank bottom waste
Disposal Method: Recycler
Tons: .2543
Facility County: Los Angeles

Gepaid: CAD981623473
Contact: VALLEY COUNTRY WATER DISTRICT
Telephone: 8183387301
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14521 RAMONA BLVD
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD008252405
TSD County: Los Angeles
Waste Category: Aqueous solution with 10% or more total organic residues
Disposal Method: Recycler
Tons: .0834
Facility County: Los Angeles

Gepaid: CAD981623473
Contact: VALLEY COUNTRY WATER DISTRICT
Telephone: 8183387301
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14521 RAMONA BLVD
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAT080022148
TSD County: San Bernardino
Waste Category: Off-specification, aged, or surplus organics
Disposal Method: Transfer Station
Tons: .0100
Facility County: Los Angeles

Gepaid: CAD981623473
Contact: VALLEY COUNTRY WATER DISTRICT
Telephone: 8183387301
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14521 RAMONA BLVD
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAT080022148
TSD County: San Bernardino
Waste Category: Paint sludge
Disposal Method: Transfer Station
Tons: .2293
Facility County: Los Angeles

Gepaid: CAD981623473
Contact: VALLEY COUNTRY WATER DISTRICT
Telephone: 8183387301

VALLEY CO WATER DIST (Continued) **1000283293**

Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14521 RAMONA BLVD
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Tank bottom waste
Disposal Method:	Recycler
Tons:	.0625
Facility County:	Los Angeles

Click this hyperlink while viewing on your computer to access
2 additional CA_HAZNET: record(s) in the EDR Site Report.

F52 **GARAGE AND WAREHOUSE** **HIST UST** **U001568754**
SE **14233 JOANBRIDGE STREET** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.213 mi.
1126 ft. **Site 2 of 6 in cluster F**

Relative:
Equal

Actual:
418 ft.

HIST UST:

Region:	STATE
Facility ID:	00000056136
Facility Type:	Other
Other Type:	WATER UTILITY
Total Tanks:	0003
Contact Name:	JAY BROWN
Telephone:	8183387301
Owner Name:	VALLEY COUNTY WATER DISTRICT
Owner Address:	14521 RAMONA BLVD.
Owner City,St,Zip:	BALDWIN PARK, CA 91706
Tank Num:	001
Container Num:	1
Year Installed:	1973
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Tank Construction:	12 gauge
Leak Detection:	None
Tank Num:	002
Container Num:	2
Year Installed:	1973
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Tank Construction:	3/16 inches
Leak Detection:	None
Tank Num:	003
Container Num:	3
Year Installed:	1977
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Tank Construction:	3/16 inches

GARAGE AND WAREHOUSE (Continued) **U001568754**

Leak Detection: None

F53 **VALLEY CO WATER DISTRICT** **HAZNET** **S103994008**
SE **14233 JOANBRIDGE** **WIP** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706** **SWEEPS UST**
0.213 mi.
1126 ft. **Site 3 of 6 in cluster F**

Relative:
Equal

Actual:
418 ft.

HAZNET:

Gepaid:	CAC001504848
Contact:	VALLEY COUNTY WATER DISTRICT
Telephone:	6263387301
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14521 E RAMONA BLVD
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Unspecified solvent mixture Waste
Disposal Method:	Transfer Station
Tons:	.0500
Facility County:	Los Angeles

WIP:

Region:	4
File Number:	108.1591
File Status:	**Backlog**
Staff:	UNIDENTIFIED
Facility Suite:	Not reported

SWEEPS UST:

Status:	Not reported
Comp Number:	14172
Number:	Not reported
Board Of Equalization:	44-010369
Ref Date:	Not reported
Act Date:	Not reported
Created Date:	Not reported
Tank Status:	Not reported
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-014172-000001
Actv Date:	Not reported
Capacity:	500
Tank Use:	M.V. FUEL
Stg:	PRODUCT
Content:	DIESEL
Number Of Tanks:	5

Status:	Not reported
Comp Number:	14172
Number:	Not reported
Board Of Equalization:	44-010369
Ref Date:	Not reported
Act Date:	Not reported
Created Date:	Not reported
Tank Status:	Not reported

VALLEY CO WATER DISTRICT (Continued) **S103994008**

Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-014172-000002
Actv Date: Not reported
Capacity: 2000
Tank Use: M.V. FUEL
Stg: PRODUCT
Content: REG UNLEADED
Number Of Tanks: Not reported

Status: Not reported
Comp Number: 14172
Number: Not reported
Board Of Equalization: 44-010369
Ref Date: Not reported
Act Date: Not reported
Created Date: Not reported
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-014172-000003
Actv Date: Not reported
Capacity: 2000
Tank Use: M.V. FUEL
Stg: PRODUCT
Content: REG UNLEADED
Number Of Tanks: Not reported

Status: Not reported
Comp Number: 14172
Number: Not reported
Board Of Equalization: 44-010369
Ref Date: Not reported
Act Date: Not reported
Created Date: Not reported
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-014172-000004
Actv Date: Not reported
Capacity: 500
Tank Use: M.V. FUEL
Stg: PRODUCT
Content: DIESEL
Number Of Tanks: Not reported

Status: Not reported
Comp Number: 14172
Number: Not reported
Board Of Equalization: 44-010369
Ref Date: Not reported
Act Date: Not reported
Created Date: Not reported
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-014172-000005
Actv Date: Not reported
Capacity: 1
Tank Use: UNKNOWN
Stg: PRODUCT

VALLEY CO WATER DISTRICT (Continued) **S103994008**

Content: Not reported
Number Of Tanks: Not reported

F54 **VALLEY CO WATER DISTRICT** **UST** **U004049168**
SE **14233 E JOANBRIDGE ST** **LOS ANGELES CO. HMS** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.213 mi.
1126 ft. **Site 4 of 6 in cluster F**

Relative:
Equal

Actual:
418 ft.

UST:
Global ID: 1804
Latitude: 34.10592
Longitude: -117.96417

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 013747-014172
Facility Status: Removed
Area: 3X
Permit Number: 00005561T
Permit Status: Removed
Facility Type: T0

F55 **VALLEY COUNTY WATER DIST** **SLIC** **S106484718**
SE **14233 JOANBRIDGE ST.** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.213 mi.
1126 ft. **Site 5 of 6 in cluster F**

Relative:
Equal

Actual:
418 ft.

SLIC:
Region: STATE
Facility Status: **Open - Reopen Case**
Status Date: 1998-01-29 00:00:00
Global Id: SL603798917
Lead Agency: LOS ANGELES RWQCB (REGION 4)
Lead Agency Case Number: Not reported
Latitude: 34.105819
Longitude: -117.963356
Case Type: Cleanup Program Site
Case Worker: Not reported
Local Agency: Not reported
RB Case Number: 108.1591
File Location: Not reported
Potential Media Affected: Aquifer used for drinking water supply
Potential Contaminants of Concern: Not reported
Site History: Not reported

F56 **CLINTON O NIXON FACILITY** **HAZNET** **S108202676**
SE **14233 JOANBRIDGE ST** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.213 mi.
1126 ft. **Site 6 of 6 in cluster F**

Relative:
Equal

Actual:
418 ft.

HAZNET:

Gepaid:	CAD981623473
Contact:	TOM MORTENSON, OPERATIONS & MAINTEN
Telephone:	6269621915
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14251 E RAMONA BLVD
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Waste oil and mixed oil
Disposal Method:	H039
Tons:	0.3
Facility County:	Los Angeles

Gepaid:	CAD981623473
Contact:	TOM MORTENSON, OPERATIONS & MAINTEN
Telephone:	6269621915
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14251 E RAMONA BLVD
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Waste oil and mixed oil
Disposal Method:	Recycler
Tons:	0.2
Facility County:	Not reported

G57 **B&W PRECISION INC** **LOS ANGELES CO. HMS** **S103944815**
WSW **13955 E LIVE OAK AVE** **N/A**
1/8-1/4 **IRWINDALE, CA**
0.216 mi.
1141 ft. **Site 1 of 6 in cluster G**

Relative:
Lower

Actual:
410 ft.

LOS ANGELES CO. HMS:

Region:	LA
Facility Id:	019420-027747
Facility Status:	Closed
Area:	3S
Permit Number:	274899
Permit Status:	Closed
Facility Type:	I09

G58 **B AND W PRECISION INC** **RCRA-SQG** **1001492833**
WSW **13955 LIVE OAK AVE** **FINDS** **CAR000055426**
1/8-1/4 **IRWINDALE, CA 91706** **HAZNET**
0.216 mi.
1141 ft. **Site 2 of 6 in cluster G**

Relative:
Lower

Actual:
410 ft.

RCRA-SQG:

Date form received by agency:	08/11/1999
Facility name:	B AND W PRECISION INC
Facility address:	13955 LIVE OAK AVE IRWINDALE, CA 91706
EPA ID:	CAR000055426
Contact:	LARRY TIPTON
Contact address:	13955 LIVE OAK AVE IRWINDALE, CA 91706
Contact country:	US
Contact telephone:	(626) 337-1120
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	LARRY E TIPTON
Owner/operator address:	13955 LIVE OAK AVE IRWINDALE, CA 91706
Owner/operator country:	Not reported
Owner/operator telephone:	(626) 337-1120
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	Unknown
Mixed waste (haz. and radioactive):	Unknown
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	Unknown
Furnace exemption:	Unknown
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No
Off-site waste receiver:	Commercial status unknown

Hazardous Waste Summary:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF

B AND W PRECISION INC (Continued) **1001492833**

LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002929369

California - Hazardous Waste Tracking System - Datamart

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZNET:

Gepaid:	CAR000055426
Contact:	LARRY E TIPTON
Telephone:	Not reported
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	1260-A PIONEER ST
Mailing City,St,Zip:	BREA, CA 928210000
Gen County:	Los Angeles
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Waste oil and mixed oil
Disposal Method:	Recycler
Tons:	0.45
Facility County:	Los Angeles

Gepaid:	CAR000055426
Contact:	LARRY E TIPTON
Telephone:	--
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	13955 LIVE OAK AVE
Mailing City,St,Zip:	IRWINDALE, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	Orange
Waste Category:	Liquids with halogenated organic compounds > 1000 mg/l
Disposal Method:	Transfer Station
Tons:	0.55
Facility County:	Not reported

Gepaid:	CAR000055426
Contact:	LARRY E TIPTON

B AND W PRECISION INC (Continued) **1001492833**

Telephone:	--
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	13955 LIVE OAK AVE
Mailing City,St,Zip:	IRWINDALE, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	Los Angeles
Waste Category:	Waste oil and mixed oil
Disposal Method:	Recycler
Tons:	0.22
Facility County:	Not reported

Gepaid:	CAR000055426
Contact:	LARRY E TIPTON
Telephone:	--
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	13955 LIVE OAK AVE
Mailing City,St,Zip:	IRWINDALE, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	Los Angeles
Waste Category:	Oil/water separation sludge
Disposal Method:	Recycler
Tons:	0.22
Facility County:	Not reported

Gepaid:	CAR000055426
Contact:	LARRY E TIPTON
Telephone:	--
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	13955 LIVE OAK AVE
Mailing City,St,Zip:	IRWINDALE, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	San Bernardino
Waste Category:	Unspecified organic liquid mixture
Disposal Method:	Transfer Station
Tons:	0.8
Facility County:	Not reported

Click this hyperlink while viewing on your computer to access
16 additional CA_HAZNET: record(s) in the EDR Site Report.

H59 **STORM DRAIN & STREET REHAB PROJECT** **NPDES** **S109459701**
ESE **ARROW HWY / LIVE OAK AVE** **N/A**
1/8-1/4 **IRWINDALE, CA 91706**
0.236 mi.
1245 ft. **Site 1 of 8 in cluster H**

Relative:
Higher

Actual:
426 ft.

NPDES:

Npdes Number:	Not reported
Facility Status:	Active
Agency Id:	444236
Region:	4
Regulatory Measure Id:	334571

STORM DRAIN & STREET REHAB PROJECT (Continued) **S109459701**

Order No:	Not reported
Order No Of General Order:	Not reported
Regulatory Measure Type:	Storm water construction
Place Id:	706634
WDID:	4 19C349603
Program Type:	CONSTW
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	11/5/2007 1:59:03 PM
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Irwindale City
Discharge Address:	Not reported
Discharge Address2:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported

H60 **RAY GASKIA** **HAZNET** **S101584477**
ESE **14312 ARROW HWY** **CA FID UST** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706** **WIP**
0.244 mi. **SWEEPS UST**
1290 ft. **Site 2 of 8 in cluster H**

Relative:
Higher

Actual:
427 ft.

HAZNET:

Gepaid:	CAL000058818
Contact:	RAY GASKIN
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14312 ARROW HWY # E
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAT000613893
TSD County:	Los Angeles
Waste Category:	Aqueous solution with less than 10% total organic residues
Disposal Method:	Transfer Station
Tons:	0.0834
Facility County:	Los Angeles

Gepaid:	CAL000058818
Contact:	RAY GASKIN
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14312 ARROW HWY # E
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	CAT000613893
TSD County:	Los Angeles
Waste Category:	Aqueous solution with less than 10% total organic residues
Disposal Method:	Transfer Station
Tons:	.0834
Facility County:	Los Angeles

CA FID UST:

Facility ID:	19011792
Regulated By:	UTNKI

RAY GASKIA (Continued) **S101584477**

Regulated ID: Not reported
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: Not reported
Mail To: Not reported
Mailing Address: PO BOX
Mailing Address 2: Not reported
Mailing City,St,Zip: BALDWIN PARK 91706
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Inactive

WIP:
Region: 4
File Number: 108.1044
File Status: Historical
Staff: RSK
Facility Suite: Not reported

SWEEPS UST:
Status: Not reported
Comp Number: 15593
Number: Not reported
Board Of Equalization: 44-032226
Ref Date: Not reported
Act Date: Not reported
Created Date: Not reported
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-015593-000001
Actv Date: Not reported
Capacity: 5000
Tank Use: M.V. FUEL
Stg: PRODUCT
Content: LEADED
Number Of Tanks: 1

H61 **CHRIS OVERTON** **LOS ANGELES CO. HMS** **S102062898**
ESE **14312 E ARROW HWY** **N/A**
1/8-1/4 **BALDWIN PARK, CA**
0.244 mi.
1290 ft. **Site 3 of 8 in cluster H**

Relative:
Higher

Actual:
427 ft.

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 014822-015593
Facility Status: Removed
Area: 3X
Permit Number: 00006291T
Permit Status: Removed
Facility Type: T0

62
South
1/8-1/4
0.246 mi.
1301 ft.

14107 CRAGMONT DR
BALDWIN PARK, CA 90040

CDL **S107528517**
N/A

Relative:
Lower

Actual:
407 ft.

CDL:
Facility ID: 199711119
Lab Type: Illegal Drug Lab (L) - location where an illegal drug lab was operated or drug lab equipment and/or materials were stored.

H63
ESE
1/8-1/4
0.247 mi.
1305 ft.

ROYAL OAKS BODY SHOP
14314 ARROW HWY
BALDWIN PARK, CA 91706
Site 4 of 8 in cluster H

WIP **S106766900**
N/A

Relative:
Higher

Actual:
427 ft.

WIP:
Region: 4
File Number: 108.1045
File Status: **Not reported**
Staff: UNIDENTIFIED
Facility Suite: Not reported

H64
ESE
1/8-1/4
0.247 mi.
1305 ft.

ROYAL OAKS BODY SHOP
14314 E ARROW HWY
BALDWIN PARK, CA 91706
Site 5 of 8 in cluster H

HAZNET **S104581861**
EMI **N/A**

Relative:
Higher

Actual:
427 ft.

HAZNET:
Gepaid: CAL000190537
Contact: JOSE AGUILA
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14314 E ARROW HWY
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD008302903
TSD County: Los Angeles
Waste Category: Hydrocarbon solvents (benzene, hexane, Stoddard, etc.)
Disposal Method: Recycler
Tons: 0.2293
Facility County: Los Angeles

EMI:
Year: 1990
County Code: 19
Air Basin: SC
Facility ID: 69190
Air District Name: SC
SIC Code: 7538
Air District Name: SOUTH COAST AQMD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 2
Reactive Organic Gases Tons/Yr: 2

ROYAL OAKS BODY SHOP (Continued) **S104581861**

Carbon Monoxide Emissions Tons/Yr: 0
NOX - Oxides of Nitrogen Tons/Yr: 0
SOX - Oxides of Sulphur Tons/Yr: 0
Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers & Smllr Tons/Yr: 0

H65 **BPS TRUCK PARTS** **WIP** **S106766901**
ESE **14316 ARROW HWY** **N/A**
1/8-1/4 **BALDWIN PARK, CA 91706**
0.250 mi.
1320 ft. **Site 6 of 8 in cluster H**

Relative:
Higher

Actual:
427 ft.

WIP:
Region: 4
File Number: 108.1046
File Status: Historical
Staff: DKOO
Facility Suite: Not reported

G66 **WEBSTERS REFUSE DISPOSAL** **RCRA-SQG** **1000388629**
WSW **13940 LIVE OAK** **FINDS** **CAD981439912**
1/4-1/2 **BALDWIN PARK, CA 91706** **LUST**
0.251 mi. **CA FID UST**
1326 ft. **Site 3 of 6 in cluster G** **HIST UST**
EMI
Relative: **WIP**
Lower **NPDES**
SWEEPS UST

Actual:
408 ft.

RCRA-SQG:
Date form received by agency: 09/01/1996
Facility name: WEBSTERS REFUSE DISPOSAL
Facility address: 13940 LIVE OAK
BALDWIN PARK, CA 91706
EPA ID: CAD981439912
Mailing address: 13940 E LIVE OAK AVE
BALDWIN PARK, CA 91706
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: Not reported
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: WASTE MANAGEMENT INC
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: Unknown
Mixed waste (haz. and radioactive): Unknown
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: Unknown
Furnace exemption: Unknown
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Historical Generators:
Date form received by agency: 09/01/1996
Facility name: WEBSTERS REFUSE DISPOSAL
Classification: Small Quantity Generator

Date form received by agency: 04/12/1990
Facility name: WEBSTERS REFUSE DISPOSAL
Classification: Large Quantity Generator

Date form received by agency: 09/03/1986
Facility name: WEBSTERS REFUSE DISPOSAL
Classification: Large Quantity Generator

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110009536591

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport,

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

LUST:

Region:	STATE
Global Id:	T0603703351
Latitude:	34.1064032
Longitude:	-117.9712352
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	1993-04-08 00:00:00
Lead Agency:	LOS ANGELES COUNTY
Case Worker:	Not reported
Local Agency:	LOS ANGELES COUNTY
RB Case Number:	I-09164
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminats of Concern:	Diesel
Site History:	Not reported

LUST REG 4:

Region:	4		
Regional Board:	04		
County:	Los Angeles		
facid:	I-09164		
Status:	Case Closed		
Substance:	Diesel		
Substance Quantity:	Not reported		
Local Case No:	Not reported		
Case Type:	Soil		
Abatement Method Used at the Site:		Not reported	
Global ID:	T0603703351		
W Global ID:	Not reported		
Staff:	UNK		
Local Agency:	19000		
Cross Street:	STUART		
Enforcement Type:	Not reported		
Date Leak Discovered:	12/21/1989		
Date Leak First Reported:		12/27/1989	
Date Leak Record Entered:	3/5/1990		
Date Confirmation Began:	12/27/1989		
Date Leak Stopped:	Not reported		
Date Case Last Changed on Database:		12/26/1991	
Date the Case was Closed:		4/8/1993	
How Leak Discovered:	Not reported		
How Leak Stopped:	Not reported		
Cause of Leak:	Not reported		
Leak Source:	Not reported		
Operator:	MULLER, MIKE		
Water System:	Not reported		
Well Name:	Not reported		
Approx. Dist To Production Well (ft):		2025.385214860576304461923259 1	
Source of Cleanup Funding:		F	

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

Preliminary Site Assessment Workplan Submitted: Not reported
Preliminary Site Assessment Began: Not reported
Pollution Characterization Began: Not reported
Remediation Plan Submitted: Not reported
Remedial Action Underway: Not reported
Post Remedial Action Monitoring Began: Not reported
Enforcement Action Date: Not reported
Historical Max MTBE Date: Not reported
Hist Max MTBE Conc in Groundwater: Not reported
Hist Max MTBE Conc in Soil: Not reported
Significant Interim Remedial Action Taken: Not reported
GW Qualifier: Not reported
Soil Qualifier: Not reported
Organization: Not reported
Owner Contact: Not reported
Responsible Party: WASTER MANAGEMENT OF N.AMERICA
RP Address: 18500 VON KARMEN AVE., IRVINE CA 92715
Program: LUST
Lat/Long: 34.1064032 / -1
Local Agency Staff: Not reported
Beneficial Use: Not reported
Priority: Not reported
Cleanup Fund Id: Not reported
Suspended: Not reported
Assigned Name: Not reported
Summary: Not reported

CA FID UST:
Facility ID: 19002303
Regulated By: UTNKA
Regulated ID: 00008005
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 8189607551
Mail To: Not reported
Mailing Address: 18500 VON KARMEN
Mailing Address 2: Not reported
Mailing City,St,Zip: BALDWIN PARK 91706
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

HIST UST:
Region: STATE
Facility ID: 00000050664
Facility Type: Not reported
Other Type: REFUSE COLLECTION
Total Tanks: 0010
Contact Name: Not reported
Telephone: 8183381189
Owner Name: WASTE MANAGEMENT, INC.
Owner Address: 3003 BUTTERFIELD ROAD

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

Owner City,St,Zip: OAK BROOK, IL 60521

Tank Num: 001
Container Num: 1
Year Installed: 1972
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Tank Construction: 1/4 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 002
Container Num: 2
Year Installed: 1972
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Tank Construction: 1/4 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 003
Container Num: 3
Year Installed: 1976
Tank Capacity: 00000550
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 004
Container Num: 4
Year Installed: 1975
Tank Capacity: 00012000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 005
Container Num: 5
Year Installed: 1975
Tank Capacity: 00012000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 006
Container Num: 6
Year Installed: 1972
Tank Capacity: 00000500
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 007

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

Container Num: 7
Year Installed: 1972
Tank Capacity: 00000500
Tank Used for: PRODUCT
Type of Fuel: Not reported
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 008
Container Num: 8
Year Installed: 1972
Tank Capacity: 00001000
Tank Used for: PRODUCT
Type of Fuel: Not reported
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 009
Container Num: 9
Year Installed: 1972
Tank Capacity: 00000500
Tank Used for: WASTE
Type of Fuel: WASTE OIL
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 010
Container Num: 10
Year Installed: 1972
Tank Capacity: 00000350
Tank Used for: WASTE
Type of Fuel: Not reported
Tank Construction: 4 inches
Leak Detection: Visual

EMI:

Year:	1990
County Code:	19
Air Basin:	SC
Facility ID:	55700
Air District Name:	SC
SIC Code:	4953
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	5
Reactive Organic Gases Tons/Yr:	5
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1995
County Code:	19
Air Basin:	SC
Facility ID:	55700

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

Air District Name:	SC
SIC Code:	4953
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	5
Reactive Organic Gases Tons/Yr:	4
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1996
County Code:	19
Air Basin:	SC
Facility ID:	55700
Air District Name:	SC
SIC Code:	4953
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	5
Reactive Organic Gases Tons/Yr:	3
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	2005
County Code:	19
Air Basin:	SC
Facility ID:	55700
Air District Name:	SC
SIC Code:	4212
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	.10817
Reactive Organic Gases Tons/Yr:	.106674369
Carbon Monoxide Emissions Tons/Yr:	.0051
NOX - Oxides of Nitrogen Tons/Yr:	.0235
SOX - Oxides of Sulphur Tons/Yr:	.000355
Particulate Matter Tons/Yr:	.00167
Part. Matter 10 Micrometers & Smllr Tons/Yr:	.00162992

WIP:

Region:	4
File Number:	108.1378
File Status:	**Not reported**
Staff:	UNIDENTIFIED
Facility Suite:	Not reported

NPDES:

Npdes Number:	Not reported

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

Facility Status:	Active
Agency Id:	51394
Region:	4
Regulatory Measure Id:	188974
Order No:	Not reported
Order No Of General Order:	97-03-DWQ
Regulatory Measure Type:	Storm water industrial
Place Id:	273437
WDID:	4 19I002472
Program Type:	INDSTW
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	3/31/1992
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Waste Management San Gabriel
Discharge Address:	13940 Live Oak Ave
Discharge Address2:	Not reported
Discharge City:	Baldwin Park
Discharge State:	CA
Discharge Zip:	91706

SWEEPS UST:

Status:	Not reported
Comp Number:	9164
Number:	Not reported
Board Of Equalization:	44-008331
Ref Date:	Not reported
Act Date:	Not reported
Created Date:	Not reported
Tank Status:	Not reported
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-009164-000002
Actv Date:	Not reported
Capacity:	10000
Tank Use:	M.V. FUEL
Stg:	PRODUCT
Content:	REG UNLEADED
Number Of Tanks:	3

Status:	Not reported
Comp Number:	9164
Number:	Not reported
Board Of Equalization:	44-008331
Ref Date:	Not reported
Act Date:	Not reported
Created Date:	Not reported
Tank Status:	Not reported
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-009164-000006
Actv Date:	Not reported
Capacity:	500
Tank Use:	OIL
Stg:	PRODUCT
Content:	Not reported
Number Of Tanks:	Not reported

Status:	Not reported

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

Comp Number: 9164
Number: Not reported
Board Of Equalization: 44-008331
Ref Date: Not reported
Act Date: Not reported
Created Date: Not reported
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-009164-000010
Actv Date: Not reported
Capacity: 1
Tank Use: UNKNOWN
Stg: PRODUCT
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 9164
Number: 1
Board Of Equalization: 44-008331
Ref Date: 08-29-89
Act Date: 08-29-89
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: 3
Swrcb Tank Id: 19-000-009164-000001
Actv Date: 01-08-93
Capacity: 10000
Tank Use: M.V. FUEL
Stg: P
Content: REG UNLEADED
Number Of Tanks: 7

Status: A
Comp Number: 9164
Number: 1
Board Of Equalization: 44-008331
Ref Date: 08-29-89
Act Date: 08-29-89
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: 6
Swrcb Tank Id: 19-000-009164-000003
Actv Date: 01-08-93
Capacity: 1000
Tank Use: OIL
Stg: W
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 9164
Number: 1
Board Of Equalization: 44-008331
Ref Date: 08-29-89
Act Date: 08-29-89
Created Date: 06-30-89

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

Tank Status: A
Owner Tank Id: 1
Swrcb Tank Id: 19-000-009164-000004
Actv Date: 01-08-93
Capacity: 1000
Tank Use: OIL
Stg: P
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 9164
Number: 1
Board Of Equalization: 44-008331
Ref Date: 08-29-89
Act Date: 08-29-89
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: 5
Swrcb Tank Id: 19-000-009164-000005
Actv Date: 01-08-93
Capacity: 500
Tank Use: OIL
Stg: P
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 9164
Number: 1
Board Of Equalization: 44-008331
Ref Date: 08-29-89
Act Date: 08-29-89
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: 7
Swrcb Tank Id: 19-000-009164-000007
Actv Date: 01-08-93
Capacity: 350
Tank Use: OIL
Stg: W
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 9164
Number: 1
Board Of Equalization: 44-008331
Ref Date: 08-29-89
Act Date: 08-29-89
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: 2
Swrcb Tank Id: 19-000-009164-000008
Actv Date: 01-08-93
Capacity: 20000
Tank Use: M.V. FUEL

WEBSTERS REFUSE DISPOSAL (Continued) **1000388629**

Stg: P
Content: DIESEL
Number Of Tanks: Not reported

Status: A
Comp Number: 9164
Number: 1
Board Of Equalization: 44-008331
Ref Date: 08-29-89
Act Date: 08-29-89
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: 4
Swrcb Tank Id: 19-000-009164-000009
Actv Date: 01-08-93
Capacity: 20000
Tank Use: M.V. FUEL
Stg: P
Content: DIESEL
Number Of Tanks: Not reported

G67 **WASTE MANGAGEMENT OF SAN GABRIEL/POMONA** **HAZNET** **S103629672**
WSW **13940 LIVE OAK** **HIST CORTESE** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.251 mi.
1326 ft. **Site 4 of 6 in cluster G**

Relative:
Lower

Actual:
408 ft.

HAZNET:
Gepaid: CAD981439912
Contact: WASTE MNGMT OF SAN GABRIEL
Telephone: 6269607551
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 13940 E LIVE OAK AVE
Mailing City,St,Zip: BALDWIN PARK, CA 917061321
Gen County: Los Angeles
TSD EPA ID: CAD008302903
TSD County: Los Angeles
Waste Category: Paint sludge
Disposal Method: Recycler
Tons: .2500
Facility County: Los Angeles

Gepaid: CAD981439912
Contact: WASTE MNGMT OF SAN GABRIEL
Telephone: 6269607551
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 13940 E LIVE OAK AVE
Mailing City,St,Zip: BALDWIN PARK, CA 917061321
Gen County: Los Angeles
TSD EPA ID: CAD982444481
TSD County: San Bernardino
Waste Category: Other organic solids
Disposal Method: Transfer Station
Tons: 2.5000
Facility County: Los Angeles

WASTE MANGAGEMENT OF SAN GABRIEL/POMONA (Continued) **S103629672**

Gepaid: CAD981439912
Contact: WASTE MNGMT OF SAN GABRIEL
Telephone: 6269607551
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 13940 E LIVE OAK AVE
Mailing City,St,Zip: BALDWIN PARK, CA 917061321
Gen County: Los Angeles
TSD EPA ID: CAD981696420
TSD County: Los Angeles
Waste Category: Oil/water separation sludge
Disposal Method: Transfer Station
Tons: 2.3976
Facility County: Los Angeles

Gepaid: CAD981439912
Contact: WASTE MNGMT OF SAN GABRIEL
Telephone: 6269607551
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 13940 E LIVE OAK AVE
Mailing City,St,Zip: BALDWIN PARK, CA 917061321
Gen County: Los Angeles
TSD EPA ID: CAD981696420
TSD County: Los Angeles
Waste Category: Aqueous solution with less than 10% total organic residues
Disposal Method: Transfer Station
Tons: .8757
Facility County: Los Angeles

Gepaid: CAD981439912
Contact: WASTE MNGMT OF SAN GABRIEL
Telephone: 6269607551
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 13940 E LIVE OAK AVE
Mailing City,St,Zip: BALDWIN PARK, CA 917061321
Gen County: Los Angeles
TSD EPA ID: CAT000646117
TSD County: Kings
Waste Category: Contaminated soil from site clean-ups
Disposal Method: Treatment, Tank
Tons: .1500
Facility County: Los Angeles

Click this hyperlink while viewing on your computer to access
72 additional CA_HAZNET: record(s) in the EDR Site Report.

CORTESE:
Region: CORTESE
Facility County Code: 19
Reg By: LTNKA
Reg Id: I-09164

G68 **SCA/WEBSTER'S REFUSE DISPOSAL** **HIST UST** **U001568802**
WSW **13940 LIVE OAK AVE** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.251 mi.
1326 ft. **Site 5 of 6 in cluster G**

Relative:
Lower

Actual:
408 ft.

HIST UST:

Region:	STATE
Facility ID:	00000008005
Facility Type:	Other
Other Type:	REFUSE COLLECTION
Total Tanks:	0010
Contact Name:	Not reported
Telephone:	8183381189
Owner Name:	SCA SERVICES, INC.
Owner Address:	60 STATE STREET
Owner City,St,Zip:	BOSTON, MA 02109
Tank Num:	001
Container Num:	1
Year Installed:	1972
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Tank Construction:	.250 inches
Leak Detection:	Visual, Stock Inventor, Pressure Test
Tank Num:	002
Container Num:	#2
Year Installed:	1972
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Tank Construction:	.250 inches
Leak Detection:	Visual, Stock Inventor, Pressure Test
Tank Num:	003
Container Num:	#3
Year Installed:	1976
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Tank Construction:	.250 inches
Leak Detection:	Visual, Stock Inventor, Pressure Test
Tank Num:	004
Container Num:	#4
Year Installed:	1975
Tank Capacity:	00012000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Tank Construction:	.250 inches
Leak Detection:	Visual, Stock Inventor, Pressure Test
Tank Num:	005
Container Num:	#5
Year Installed:	1975
Tank Capacity:	00012000
Tank Used for:	PRODUCT

SCA/WEBSTER'S REFUSE DISPOSAL (Continued) **U001568802**

Type of Fuel: DIESEL
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 006
Container Num: #6
Year Installed: 1972
Tank Capacity: 00000500
Tank Used for: PRODUCT
Type of Fuel: Not reported
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 007
Container Num: #7
Year Installed: 1972
Tank Capacity: 00000500
Tank Used for: PRODUCT
Type of Fuel: Not reported
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 008
Container Num: #8
Year Installed: 1972
Tank Capacity: 00001000
Tank Used for: PRODUCT
Type of Fuel: Not reported
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 009
Container Num: #9
Year Installed: 1972
Tank Capacity: 00000500
Tank Used for: WASTE
Type of Fuel: WASTE OIL
Tank Construction: .250 inches
Leak Detection: Visual, Stock Inventor, Pressure Test

Tank Num: 010
Container Num: #10
Year Installed: 1972
Tank Capacity: 00000350
Tank Used for: WASTE
Type of Fuel: Not reported
Tank Construction: 4" centimeters
Leak Detection: Visual

G69 **WASTE MGT-SAN GABRIEL/POMONA V** **UST** **U004050884**
WSW **13940 LIVE OAK AVE** **LOS ANGELES CO. HMS** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.251 mi.
1326 ft. **Site 6 of 6 in cluster G**

Relative:
Lower

Actual:
408 ft.

UST:
Global ID: 587
Latitude: 34.10665
Longitude: -117.97055

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 009361-009164
Facility Status: Permit
Area: 3X
Permit Number: 00000148T
Permit Status: Permit
Facility Type: T0

H70 **CALIFORNIA CLOSET CO.,** **WIP** **S106766411**
ESE **14338 E ARROW HWY** **N/A**
1/4-1/2 **IRWINDALE, CA 91706**
0.281 mi.
1481 ft. **Site 7 of 8 in cluster H**

Relative:
Higher

Actual:
429 ft.

WIP:
Region: 4
File Number: 108.0321
File Status: Not reported
Staff: UNIDENTIFIED
Facility Suite: Not reported

H71 **PERFORMANCE RECOVERY INC** **HAZNET** **S103981540**
ESE **14340 ARROW HWY** **WIP** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.283 mi.
1495 ft. **Site 8 of 8 in cluster H**

Relative:
Higher

Actual:
429 ft.

HAZNET:
Gepaid: CAP000038711
Contact: DANIEL KISHNER
Telephone: 6263388966
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14340 ARROW HWY
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD008252405
TSD County: Los Angeles
Waste Category: Liquids with halogenated organic compounds > 1000 mg/l
Disposal Method: Recycler
Tons: .6880
Facility County: Los Angeles

Gepaid: CAP000038711
Contact: DANIEL KISHNER
Telephone: 6263388966

PERFORMANCE RECOVERY INC (Continued) **S103981540**

Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14340 ARROW HWY
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD000088252
TSD County: Los Angeles
Waste Category: Laboratory waste chemicals
Disposal Method: Transfer Station
Tons: .0750
Facility County: Los Angeles

Gepaid: CAP000038711
Contact: DANIEL KISHNER
Telephone: 6263388966
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14340 ARROW HWY
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD008364432
TSD County: Los Angeles
Waste Category: Liquids with halogenated organic compounds > 1000 mg/l
Disposal Method: Recycler
Tons: 2.2935
Facility County: Los Angeles

WIP:
Region: 4
File Number: 108.1047
File Status: Historical
Staff: DKOO
Facility Suite: Not reported

72
ESE
1/4-1/2
0.292 mi.
1540 ft.

CROWNER SHEET METAL PRODUCT., **HIST UST** **U001568739**
14346 ARROW HWY **WIP** **N/A**
BALDWIN PARK, CA 91706

Relative:
Higher

Actual:
430 ft.

HIST UST:
Region: STATE
Facility ID: 00000066235
Facility Type: Gas Station
Other Type: SHEET METAL
Total Tanks: 0001
Contact Name: LYLE L. LOVELESS
Telephone: 8189604971
Owner Name: CROWNER SHEET METAL PROD., INC
Owner Address: 14346 ARROW HWY
Owner City,St,Zip: BALDWIN PARK, CA 91706

Tank Num: 001
Container Num: 1
Year Installed: 1952
Tank Capacity: 00001000
Tank Used for: WASTE

CROWNER SHEET METAL PRODUCT., (Continued) **U001568739**

Type of Fuel: 1
Tank Construction: Unkown inches
Leak Detection: None

WIP:
Region: 4
File Number: 108.1048
File Status: Historical
Staff: RSK
Facility Suite: Not reported

73
ESE
1/4-1/2
0.300 mi.
1582 ft.

BT ENTERPRISES **WIP** **S106767090**
14343 JOANBRIDGE ST **N/A**
BALDWIN PARK, CA 91706

Relative:
Higher

Actual:
424 ft.

WIP:
Region: 4
File Number: 108.1333
File Status: Historical
Staff: UNIDENTIFIED
Facility Suite: Not reported

I74
WSW
1/4-1/2
0.363 mi.
1916 ft.

BLUE SKY AVIATION INC **RCRA-SQG** **1000857074**
5188 COMMERCE DR **FINDS** **CA0000036434**
BALDWIN PARK, CA 91706 **HAZNET**

Site 1 of 5 in cluster I

Relative:
Lower

Actual:
403 ft.

RCRA-SQG:
Date form received by agency: 01/25/1995
Facility name: BLUE SKY AVIATION INC
Facility address: 5188 COMMERCE DR
BALDWIN PARK, CA 91706
EPA ID: CA0000036434
Contact: SING KWAN
Contact address: 5188 COMMERCE DR
BALDWIN PARK, CA 91706
Contact country: US
Contact telephone: (818) 813-0583
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: OTTING ENTERPRISES INC
Owner/operator address: P O BOX 722
GLENDORA, CA 91740
Owner/operator country: Not reported

BLUE SKY AVIATION INC (Continued) **1000857074**

Owner/operator telephone: (818) 338-2116
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: Unknown
Mixed waste (haz. and radioactive): Unknown
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: Unknown
Furnace exemption: Unknown
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002611424

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZNET:
Gepaid: CA0000036434
Contact: OTTING ENTERPRISES INC
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5188 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD050806850
TSD County: Los Angeles
Waste Category: Alkaline solution without metals (pH > 12.5)
Disposal Method: Transfer Station
Tons: 0.0417
Facility County: Los Angeles

Gepaid: CA0000036434
Contact: OTTING ENTERPRISES INC

BLUE SKY AVIATION INC (Continued) **1000857074**

Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5188 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD050806850
TSD County: Los Angeles
Waste Category: Other inorganic solid waste
Disposal Method: Transfer Station
Tons: 0.08
Facility County: Los Angeles

Gepaid: CA0000036434
Contact: OTTING ENTERPRISES INC
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5188 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD050806850
TSD County: Los Angeles
Waste Category: Waste oil and mixed oil
Disposal Method: Transfer Station
Tons: 1.3134
Facility County: Los Angeles

Gepaid: CA0000036434
Contact: OTTING ENTERPRISES INC
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5188 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD050806850
TSD County: Los Angeles
Waste Category: Off-specification, aged, or surplus organics
Disposal Method: Transfer Station
Tons: 1.0323
Facility County: Los Angeles

Gepaid: CA0000036434
Contact: OTTING ENTERPRISES INC
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5188 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD050806850
TSD County: Los Angeles
Waste Category: Other organic solids
Disposal Method: Transfer Station
Tons: 0.075
Facility County: Los Angeles

BLUE SKY AVIATION INC (Continued) **1000857074**

Click this hyperlink while viewing on your computer to access
8 additional CA_HAZNET: record(s) in the EDR Site Report.

I75 WSW 1/4-1/2 0.363 mi. 1916 ft. **TOUCHDOWN TECHNOLOGIES** **RCRA-SQG** **1010313332**
5188 COMMERCE DRIVE **CAL000290253**
BALDWIN PARK, CA 91706

Site 2 of 5 in cluster I

Relative: Lower

Actual: 403 ft.

RCRA-SQG:

Date form received by agency:	01/12/2006
Facility name:	TOUCHDOWN TECHNOLOGIES
Facility address:	5188 COMMERCE DRIVE BALDWIN PARK, CA 91706
EPA ID:	CAL000290253
Contact:	RAUL LOPEZ
Contact address:	Not reported Not reported
Contact country:	Not reported
Contact telephone:	(626) 472-6732
Telephone ext.:	113
Contact email:	RLOPEZ@TDTECH.COM
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	OTTING ENTERPRISES, INC
Owner/operator address:	7211 DAPHODILE PL. CARLSBAD, CA 92011
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	01/01/1995
Owner/Op end date:	Not reported

Owner/operator name:	TOUCHDOWN TECHNOLOGIES
Owner/operator address:	Not reported Not reported
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	01/01/2005
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No

TOUCHDOWN TECHNOLOGIES (Continued) **1010313332**

Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Universal Waste Summary:
Waste type: Batteries
Accumulated waste on-site: No
Generated waste on-site: No

Waste type: Lamps
Accumulated waste on-site: No
Generated waste on-site: No

Waste type: Pesticides
Accumulated waste on-site: No
Generated waste on-site: No

Waste type: Thermostats
Accumulated waste on-site: No
Generated waste on-site: No

Historical Generators:
Date form received by agency: 01/12/2006
Facility name: TOUCHDOWN TECHNOLOGIES
Classification: Large Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Biennial Reports:

TOUCHDOWN TECHNOLOGIES (Continued) **1010313332**

Last Biennial Reporting Year: 2007

Annual Waste Handled:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Amount (Lbs):	10800
Waste code:	D002
Waste name:	A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.
Amount (Lbs):	54280

Violation Status: No violations found

I76 **TOUCHDOWN TECHNOLOGIES** **MANIFEST** **S109247747**
WSW **5188 COMMERCE DRIVE** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.363 mi.
1916 ft. **Site 3 of 5 in cluster I**

Relative:
Lower

Actual:
403 ft.

PA MANIFEST:

Manifest Number:	002752723JJK
Manifest Type:	Not reported
Generator Epa Id:	CAL000290253
Generator Date:	11/12/2007 0:00:00
Mailing Address:	Not reported
Mailing City,St,Zip:	Not reported
Contact Name:	RAUL LOPEZ
Contact Phone:	626-472-6732
TSD Epa Id:	PAD002365849
TSD Date:	Not reported
TSD Facility Name:	ABINGTON RELDAN REFINING & RECYCLING INC
TSD Facility Address:	4924 WELLINGTON STREET
TSD Facility City:	PHILADELPHIA
TSD Facility State:	PA
Facility Telephone:	Not reported
Page Number:	1
Line Number:	1
Waste Number:	D002
Container Number:	1
Container Type:	DF
Waste Quantity:	55.00
Unit:	G
Handling Code:	Not reported
Tsp Epa Id:	Not reported
Date Tsp Sig:	Not reported

J77
ESE
1/4-1/2
0.370 mi.
1952 ft.

LOU'S SIGNAL SERVICE
14402 E ARROW HIGHWAY
BALDWIN PARK, CA 91706

EDR Historical Auto Stations **1008994630**
N/A

Site 1 of 3 in cluster J

Relative:
Higher

Actual:
431 ft.

EDR Historical Auto Stations:
Name: LOU'S SIGNAL SERVICE
Year: 1959
Type: Not reported

J78
ESE
1/4-1/2
0.372 mi.
1965 ft.

RUDY'S TIRES
14402 ARROW HWY
BALDWIN PARK, CA 91706

WIP **S106766902**
N/A

Site 2 of 3 in cluster J

Relative:
Higher

Actual:
431 ft.

WIP:
Region: 4
File Number: 108.1049
File Status: Historical
Staff: RSK
Facility Suite: Not reported

I79
WSW
1/4-1/2
0.377 mi.
1988 ft.

ARYANA CORP DBA MMC PHT
5170 COMMERCE DR
BALDWIN PARK, CA 91706

RCRA-SQG **1000151008**
FINDS **CAD982523441**

Site 4 of 5 in cluster I

Relative:
Lower

Actual:
402 ft.

RCRA-SQG:
Date form received by agency: 09/01/1996
Facility name: ARYANA CORP DBA MMC PHT
Facility address: 5170 COMMERCE DR
BALDWIN PARK, CA 91706
EPA ID: CAD982523441
Mailing address: PO BOX 3125
SOUTH EL MONTE, CA 91733
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: Not reported
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212

ARYANA CORP DBA MMC PHT (Continued) **1000151008**

Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: CHESTER L OTTING
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: Unknown
Mixed waste (haz. and radioactive): Unknown
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: Unknown
Furnace exemption: Unknown
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Historical Generators:
Date form received by agency: 06/02/1989
Facility name: ARYANA CORP DBA MMC PHT
Classification: Large Quantity Generator

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002841747

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

I80
WSW
1/4-1/2
0.377 mi.
1988 ft.

MMC/PHT
5170 COMMERCE DR
BALDWIN PARK, CA 91706

Site 5 of 5 in cluster I

Relative:
Lower

Actual:
402 ft.

WIP **S106767016**
N/A

WIP:
Region: 4
File Number: 108.1218
File Status: Historical
Staff: UNIDENTIFIED
Facility Suite: Not reported

K81
WSW
1/4-1/2
0.388 mi.
2046 ft.

UNITEX
5175 COMMERCE DR
BALDWIN PARK, CA 91706

Site 1 of 7 in cluster K

Relative:
Lower

Actual:
401 ft.

WIP **S106767017**
N/A

WIP:
Region: 4
File Number: 108.1219
File Status: Historical
Staff: WLIU
Facility Suite: Not reported

K82
WSW
1/4-1/2
0.388 mi.
2047 ft.

COVENTRY MFG CO INC
5152 COMMERCE DR
BALDWIN PARK, CA 91706

Site 2 of 7 in cluster K

Relative:
Lower

Actual:
401 ft.

RCRA-SQG **1000208868**
FINDS **CAD006326805**
HAZNET
WIP

RCRA-SQG:
Date form received by agency: 09/01/1996
Facility name: COVENTRY MFG CO INC
Facility address: 5152 COMMERCE DR
BALDWIN PARK, CA 91706
EPA ID: CAD006326805
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: Not reported
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Land type: Facility is not located on Indian land. Additional information is not known.
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported

COVENTRY MFG CO INC (Continued) **1000208868**

Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: Unknown
Mixed waste (haz. and radioactive): Unknown
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: Unknown
Furnace exemption: Unknown
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Historical Generators:
Date form received by agency: 06/20/1985
Facility name: COVENTRY MFG CO INC
Classification: Large Quantity Generator

Facility Has Received Notices of Violations:
Regulation violated: FR - 262.10-12.A
Area of violation: Generators - General
Date violation determined: 06/07/1994
Date achieved compliance: 06/07/1999
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:

COVENTRY MFG CO INC (Continued) **1000208868**

Evaluation date: 06/07/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 06/07/1999
Evaluation lead agency: State Contractor/Grantee

Evaluation date: 04/27/1993
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State Contractor/Grantee

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002629790

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZNET:
Gepaid: CAC001468848
Contact: COVENTRY MFTG DBA BRANDON INTE
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5152 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD000088252
TSD County: Los Angeles
Waste Category: Unspecified solvent mixture Waste
Disposal Method: Transfer Station
Tons: 0.417
Facility County: Los Angeles

Gepaid: CAC001468848
Contact: COVENTRY MFTG DBA BRANDON INTE
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5152 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAD000088252
TSD County: Los Angeles
Waste Category: Off-specification, aged, or surplus organics
Disposal Method: Transfer Station
Tons: 0.2293
Facility County: Los Angeles

COVENTRY MFG CO INC (Continued) **1000208868**

WIP:
Region: 4
File Number: 108.0568
File Status: Historical
Staff: PAR
Facility Suite: Not reported

Region: 4
File Number: 108.1216
File Status: Historical
Staff: DRASMUSS
Facility Suite: Not reported

K83 **DENOVO** **HAZNET S106767014**
WSW **5130 COMMERCE DR** **WIP N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.389 mi.
2054 ft. **Site 3 of 7 in cluster K**

Relative:
Lower

Actual:
401 ft.

HAZNET:
Gepaid: CAL000196352
Contact: RICHARD PARKER\\ OWNER
Telephone: 6269395000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: PO BOX 548
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAT080033681
TSD County: Los Angeles
Waste Category: Liquids with pH <UN-> 2 with metals
Disposal Method: Recycler
Tons: 0.16
Facility County: Los Angeles

Gepaid: CAL000196352
Contact: RICHARD PARKER\\ OWNER
Telephone: 6269395000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: PO BOX 548
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: CAT080033681
TSD County: Los Angeles
Waste Category: Waste oil and mixed oil
Disposal Method: Recycler
Tons: 0.14
Facility County: Los Angeles

Gepaid: CAL000196352
Contact: RICHARD PARKER\\ OWNER
Telephone: 6269395000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: PO BOX 548
Mailing City,St,Zip: BALDWIN PARK, CA 917060000

DENOVO (Continued) **S106767014**

Gen County: Los Angeles
TSD EPA ID: CAD008252405
TSD County: Los Angeles
Waste Category: Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method: Recycler
Tons: 0.12
Facility County: Los Angeles

WIP:
Region: 4
File Number: 108.1213
File Status: Historical
Staff: UNIDENTIFIED
Facility Suite: Not reported

K84 **OCCUPANT** **WIP** **S106767267**
WSW **5161 COMMERCE DR** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.403 mi.
2128 ft. **Site 4 of 7 in cluster K**

Relative:
Lower

Actual:
400 ft.

WIP:
Region: 4
File Number: 108.1592
File Status: Not reported
Staff: UNIDENTIFIED
Facility Suite: Not reported

L85 **J.R. CUSTOM CABINETS** **EMI** **S106767091**
ESE **14412 JOANBRIDGE ST** **WIP** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.404 mi.
2131 ft. **Site 1 of 16 in cluster L**

Relative:
Higher

Actual:
428 ft.

EMI:
Year: 2006
County Code: 19
Air Basin: SC
Facility ID: 151317
Air District Name: SC
SIC Code: 1751
Air District Name: SOUTH COAST AQMD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: .5810304686709181091
Reactive Organic Gases Tons/Yr: .574
Carbon Monoxide Emissions Tons/Yr: 0
NOX - Oxides of Nitrogen Tons/Yr: 0
SOX - Oxides of Sulphur Tons/Yr: 0
Particulate Matter Tons/Yr: .027
Part. Matter 10 Micrometers & Smllr Tons/Yr: .02592

WIP:
Region: 4

J.R. CUSTOM CABINETS (Continued) **S106767091**

File Number: 108.1335
File Status: Historical
Staff: PAR
Facility Suite: Not reported

L86 **L & N TIRE** **WIP** **S106767148**
ESE **5122 N MAINE AVE** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.408 mi.
2153 ft. **Site 2 of 16 in cluster L**

Relative:
Higher

Actual:
426 ft.

WIP:
Region: 4
File Number: 108.1420
File Status: Historical
Staff: RASTON
Facility Suite: Not reported

K87 **HOME SAVINGS OF AMERICA** **HAZNET** **S103956782**
WSW **5050 COMMERCE DR** **SWEEPS UST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.408 mi.
2156 ft. **Site 5 of 7 in cluster K**

Relative:
Lower

Actual:
399 ft.

HAZNET:
Gepaid: CAH777001056
Contact: LA COUNTY SANITATION DIST
Telephone: 5626997411
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 1955 WORKMAN MILL RD
Mailing City,St,Zip: WHITTIER, CA 906010000
Gen County: Los Angeles
TSD EPA ID: CAD981696420
TSD County: Los Angeles
Waste Category: Aqueous solution with less than 10% total organic residues
Disposal Method: Transfer Station
Tons: .4587
Facility County: Los Angeles

Gepaid: CAH777001056
Contact: LA COUNTY SANITATION DIST
Telephone: 5626997411
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 1955 WORKMAN MILL RD
Mailing City,St,Zip: WHITTIER, CA 906010000
Gen County: Los Angeles
TSD EPA ID: CAD008302903
TSD County: Los Angeles
Waste Category: Household waste
Disposal Method: Recycler
Tons: 31.9342
Facility County: Los Angeles

Gepaid: CAH777001056

HOME SAVINGS OF AMERICA (Continued) **S103956782**

Contact: LA COUNTY SANITATION DIST
Telephone: 5626997411
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 1955 WORKMAN MILL RD
Mailing City,St,Zip: WHITTIER, CA 906010000
Gen County: Los Angeles
TSD EPA ID: CAD088504881
TSD County: Orange
Waste Category: Household waste
Disposal Method: Transfer Station
Tons: .0050
Facility County: Los Angeles

Gepaid: CAH777001056
Contact: LA COUNTY SANITATION DIST
Telephone: 5626997411
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 1955 WORKMAN MILL RD
Mailing City,St,Zip: WHITTIER, CA 906010000
Gen County: Los Angeles
TSD EPA ID: CAT000646117
TSD County: Kings
Waste Category: Household waste
Disposal Method: Disposal, Land Fill
Tons: .2958
Facility County: Los Angeles

Gepaid: CAH777001056
Contact: LA COUNTY SANITATION DIST
Telephone: 5626997411
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 1955 WORKMAN MILL RD
Mailing City,St,Zip: WHITTIER, CA 906010000
Gen County: Los Angeles
TSD EPA ID: CAT000646117
TSD County: Kings
Waste Category: Polychlorinated biphenyls and material containing PCB's
Disposal Method: Transfer Station
Tons: .0132
Facility County: Los Angeles

Click this hyperlink while viewing on your computer to access
22 additional CA_HAZNET: record(s) in the EDR Site Report.

SWEEPS UST:
Status: A
Comp Number: 14923
Number: 1
Board Of Equalization: 44-008198
Ref Date: 09-20-89
Act Date: 09-20-89
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: Not reported

HOME SAVINGS OF AMERICA (Continued) **S103956782**

Swrcb Tank Id: 19-000-014923-000001
Actv Date: 09-20-89
Capacity: 10000
Tank Use: UNKNOWN
Stg: P
Content: Not reported
Number Of Tanks: 1

K88
WSW
1/4-1/2
0.408 mi.
2156 ft.

HOME SAVINGS OF AMERICA, **UST** **U004049184**
5050 COMMERCE DR **N/A**
BALDWIN PARK, CA 91706

Site 6 of 7 in cluster K

Relative:
Lower

Actual:
399 ft.

UST:
Global ID: 1854
Latitude: 34.10473
Longitude: -117.97289

L89
ESE
1/4-1/2
0.414 mi.
2185 ft.

KAYMAY AUTOMOTIVE **WIP** **S106767147**
5116 MAINE AVE **N/A**
BALDWIN PARK, CA 91706

Site 3 of 16 in cluster L

Relative:
Higher

Actual:
426 ft.

WIP:
Region: 4
File Number: 108.1418
File Status: Historical
Staff: MSMYTHE
Facility Suite: Not reported

L90
ESE
1/4-1/2
0.418 mi.
2206 ft.

MO-CO PRODUCTS **WIP** **S106767093**
14434 JOANBRIDGE ST **N/A**
BALDWIN PARK, CA 91706

Site 4 of 16 in cluster L

Relative:
Higher

Actual:
429 ft.

WIP:
Region: 4
File Number: 108.1338
File Status: Historical
Staff: PAR
Facility Suite: A

L91 **J. C. BOOKCASE MFG. CO.** **WIP** **S106767092**
ESE **14434 JOANBRIDGE ST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.418 mi.
2206 ft. **Site 5 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

WIP:
Region: 4
File Number: 108.1337
File Status: Historical
Staff: PAR
Facility Suite: B

L92 **CHUMO CONSTRUCTION INC** **LOS ANGELES CO. HMS** **U001568735**
ESE **14427 JOANBRIDGE ST** **HIST UST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706** **HIST CORTESE**
0.419 mi.
2213 ft. **Site 6 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 011621-011673
Facility Status: Removed
Area: 3X
Permit Number: 00003243T
Permit Status: Removed
Facility Type: T0

HIST UST:
Region: STATE
Facility ID: 00000018999
Facility Type: Other
Other Type: CONSTRUCTION
Total Tanks: 0003
Contact Name: GEORGE CHUMO
Telephone: 8189609502
Owner Name: GEORGE CHUMO
Owner Address: 14427 JOANBRIDGE ST
Owner City,St,Zip: BALDWIN PARK, CA 91706

Tank Num: 001
Container Num: 1
Year Installed: Not reported
Tank Capacity: 00000500
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Tank Construction: Not reported
Leak Detection: Stock Inventor, None

Tank Num: 002
Container Num: 2
Year Installed: Not reported
Tank Capacity: 00001000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Tank Construction: Not reported
Leak Detection: Stock Inventor, None

Tank Num: 003

CHUMO CONSTRUCTION INC (Continued) **U001568735**

Container Num: 3
Year Installed: Not reported
Tank Capacity: 00000500
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Tank Construction: Not reported
Leak Detection: Stock Inventor, None

CORTESE:
Region: CORTESE
Facility County Code: 19
Reg By: LTNKA
Reg Id: I-11673

L93 **CHUMO CONSTRUCTION INC** **CA FID UST** **S101618737**
ESE **14427 JOANBRIDGE ST** **SWEEPS UST** **N/A**
1/4-1/2 **BALDWIN PARK, CA**
0.419 mi.
2213 ft. **Site 7 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

CA FID UST:
Facility ID: 19003060
Regulated By: UTNKA
Regulated ID: 00018999
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 8180000000
Mail To: Not reported
Mailing Address: 14427 JOANBRIDGE ST
Mailing Address 2: Not reported
Mailing City,St,Zip: BALDWIN PARK
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

SWEEPS UST:
Status: A
Comp Number: 11673
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: Not reported
Actv Date: Not reported
Capacity: Not reported
Tank Use: Not reported
Stg: Not reported
Content: Not reported
Number Of Tanks: Not reported

L94 **CHUMO CONSTRUCTION** **LUST** **S105033866**
ESE **14427 JOANBRIDGE ST** **WIP** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.419 mi.
2213 ft. **Site 8 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

LUST:

Region:	STATE
Global Id:	T0603703830
Latitude:	34.1056612
Longitude:	-117.9601618
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	1991-08-01 00:00:00
Lead Agency:	LOS ANGELES COUNTY
Case Worker:	Not reported
Local Agency:	LOS ANGELES COUNTY
RB Case Number:	I-11673
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminats of Concern:	Gasoline
Site History:	Not reported

LUST REG 4:

Region:	4	
Regional Board:	04	
County:	Los Angeles	
facid:	I-11673	
Status:	Case Closed	
Substance:	Gasoline	
Substance Quantity:	Not reported	
Local Case No:	Not reported	
Case Type:	Soil	
Abatement Method Used at the Site:		Not reported
Global ID:	T0603703830	
W Global ID:	Not reported	
Staff:	UNK	
Local Agency:	19000	
Cross Street:	SIERRA MADRE AVE	
Enforcement Type:	Not reported	
Date Leak Discovered:	1/30/1991	
Date Leak First Reported:		2/20/1991
Date Leak Record Entered:	4/5/1991	
Date Confirmation Began:	Not reported	
Date Leak Stopped:	1/30/1991	
Date Case Last Changed on Database:		4/18/1991
Date the Case was Closed:		8/1/1991
How Leak Discovered:	Tank Closure	
How Leak Stopped:	Not reported	
Cause of Leak:	UNK	
Leak Source:	UNK	
Operator:	CHUMO, GEORGE	
Water System:	Not reported	
Well Name:	Not reported	
Approx. Dist To Production Well (ft):		215.35743122840545638161288521
Source of Cleanup Funding:		UNK
Preliminary Site Assessment Workplan Submitted:		Not reported
Preliminary Site Assessment Began:		2/20/1991

CHUMO CONSTRUCTION (Continued) **S105033866**

Pollution Characterization Began:	Not reported
Remediation Plan Submitted:	Not reported
Remedial Action Underway:	Not reported
Post Remedial Action Monitoring Began:	Not reported
Enforcement Action Date:	Not reported
Historical Max MTBE Date:	Not reported
Hist Max MTBE Conc in Groundwater:	Not reported
Hist Max MTBE Conc in Soil:	Not reported
Significant Interim Remedial Action Taken:	Not reported
GW Qualifier:	Not reported
Soil Qualifier:	Not reported
Organization:	Not reported
Owner Contact:	Not reported
Responsible Party:	BLANK RP
RP Address:	Not reported
Program:	LUST
Lat/Long:	34.1056612 / -1
Local Agency Staff:	Not reported
Beneficial Use:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Suspended:	Not reported
Assigned Name:	Not reported
Summary:	OLD CASE #041891-06

WIP:

Region:	4
File Number:	108.1336
File Status:	**Historical**
Staff:	PAR
Facility Suite:	Not reported

K95 **SUES, YOUNG & BROWN, INC.** **WIP** **S106767015**
WSW **5151 COMMERCE DR** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.420 mi.
2217 ft. **Site 7 of 7 in cluster K**

Relative:
Lower

Actual:
399 ft.

WIP:

Region:	4
File Number:	108.1215
File Status:	**Historical**
Staff:	WLIU
Facility Suite:	Not reported

J96 **CHUMO CONSTRUCTION INC.** **WIP** **S106766903**
ESE **14424 ARROW HWY** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.421 mi.
2221 ft. **Site 3 of 3 in cluster J**

Relative:
Higher

Actual:
434 ft.

WIP:

Region:	4
File Number:	108.1050
File Status:	**Historical**
Staff:	DRASMUSS

CHUMO CONSTRUCTION INC. (Continued) **S106766903**

Facility Suite: Not reported

L97 **JOHN'S BACKHOE** **WIP** **S106767099**
ESE **14440 JOANBRIDGE ST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.423 mi.
2235 ft. **Site 9 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

WIP:
Region: 4
File Number: 108.1344
File Status: **Historical**
Staff: UNIDENTIFIED
Facility Suite: Not reported

M98 **GREENHOUSE RECYCLING** **SWRCY** **S109348867**
NW **1620 E ARROW HWY** **N/A**
1/4-1/2 **IRWINDALE, CA 91706**
0.427 mi.
2253 ft. **Site 1 of 5 in cluster M**

Relative:
Higher

Actual:
434 ft.

SWRCY:

Certification Status:	D
Facility Phone Number:	(626) 622-4647
Date facility became certified:	12/17/2008
Date facility began operating:	3/4/2009
Date facility ceased operating:	3/3/2009
Whether The Facility Is Grandfathered:	Not reported
Convenience Zone Where Faciltiy Located:	Not Accepted
Convenience Zone Where Faciltiy Located 2:	Not Accepted
Convenience Zone Where Faciltiy Located 3:	Not Accepted
Convenience Zone Where Faciltiy Located 4:	Not Accepted
Convenience Zone Where Faciltiy Located 5:	Not Accepted
Convenience Zone Where Faciltiy Located 6:	Not Accepted
Convenience Zone Where Faciltiy Located 7:	Not Accepted
Aluminum Beverage Containers Redeemed:	AL
Glass Beverage Containers Redeemed:	GL
Plastic Beverage Containers Redeemed:	PL
Other mat beverage containers redeemed:	Not reported
Refillable Beverage Containers Redeemed:	Not reported

L99 **METCALF LATHING** **WIP** **S106767094**
ESE **14439 JOANBRIDGE ST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.431 mi.
2276 ft. **Site 10 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

WIP:
Region: 4
File Number: 108.1339
File Status: **Not reported**
Staff: UNIDENTIFIED
Facility Suite: Not reported

L100 **J & M INDUSTRIES** **WIP** **S106767097**
ESE **14439 JOANBRIDGE ST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.431 mi.
2276 ft. **Site 11 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

WIP:
Region: 4
File Number: 108.1342
File Status: **Not reported**
Staff: UNIDENTIFIED
Facility Suite: C

L101 **ODIN FORGE** **WIP** **S106767098**
ESE **14439 JOANBRIDGE ST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.431 mi.
2276 ft. **Site 12 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

WIP:
Region: 4
File Number: 108.1343
File Status: **Not reported**
Staff: UNIDENTIFIED
Facility Suite: E

L102 **BATCHELOR MACHINE** **WIP** **S106767095**
ESE **14439 JOANBRIDGE ST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.431 mi.
2276 ft. **Site 13 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

WIP:
Region: 4
File Number: 108.1340
File Status: **Historical**
Staff: PAR
Facility Suite: Not reported

L103 **LUJAN'S IRON WORK** **WIP** **S106767096**
ESE **14439 JOANBRIDGE ST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.431 mi.
2276 ft. **Site 14 of 16 in cluster L**

Relative:
Higher

Actual:
429 ft.

WIP:
Region: 4
File Number: 108.1341
File Status: **Not reported**
Staff: UNIDENTIFIED
Facility Suite: A

L104
ESE
1/4-1/2
0.437 mi.
2309 ft.

WEESHOFF EQUIPMENT CO.
14460 JOANBRIDGE ST
BALDWIN PARK, CA 91706

Site 15 of 16 in cluster L

HIST UST **U001568830**
N/A

Relative:
Higher

Actual:
430 ft.

HIST UST:

Region:	STATE
Facility ID:	00000034140
Facility Type:	Other
Other Type:	EQUIPMENT CO.
Total Tanks:	0005
Contact Name:	Not reported
Telephone:	8189628791
Owner Name:	WEESHOFF EQUIPMENT CO.
Owner Address:	P.O. BOX 610
Owner City,St,Zip:	BALDWIN PARK, CA 91760
Tank Num:	001
Container Num:	3
Year Installed:	Not reported
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Tank Construction:	Not reported
Leak Detection:	None
Tank Num:	002
Container Num:	4
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Tank Construction:	Not reported
Leak Detection:	None
Tank Num:	003
Container Num:	5
Year Installed:	Not reported
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Tank Construction:	Not reported
Leak Detection:	Not reported
Tank Num:	004
Container Num:	1
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Tank Construction:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	005
Container Num:	2
Year Installed:	1980
Tank Capacity:	00007000
Tank Used for:	PRODUCT

WEESHOFF EQUIPMENT CO. (Continued) **U001568830**

Type of Fuel: DIESEL
Tank Construction: Not reported
Leak Detection: Stock Inventor

L105 **WEESHOFF ENTERPRIZES INC** **CA FID UST** **S101618743**
ESE **14460 JOANBRIDGE ST** **SWEEPS UST** **N/A**
1/4-1/2 **BALDWIN PARK, CA**
0.437 mi.
2309 ft. **Site 16 of 16 in cluster L**

Relative:
Higher

Actual:
430 ft.

CA FID UST:
Facility ID: 19055055
Regulated By: UTNKA
Regulated ID: 00034140
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 8180000000
Mail To: Not reported
Mailing Address: BOX
Mailing Address 2: Not reported
Mailing City,St,Zip: BALDWIN PARK
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

SWEEPS UST:
Status: A
Comp Number: 12400
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: Not reported
Actv Date: Not reported
Capacity: Not reported
Tank Use: Not reported
Stg: Not reported
Content: Not reported
Number Of Tanks: Not reported

106
WNW
1/4-1/2
0.450 mi.
2378 ft.

ALL AMERICAN ASPHALT
13646 LIVE OAK LN
BALDWIN PARK, CA 91706

UST **U004049589**
N/A

Relative:
Lower

Actual:
408 ft.

UST:
Global ID: 2869
Latitude: 34.11375
Longitude: -117.97512

N107
SW
1/4-1/2
0.456 mi.
2406 ft.

GRAPHIC INSTALLATION SERV
5120 COMMERCE DR
BALDWIN PARK, CA 91706
Site 1 of 3 in cluster N

WIP **S106767013**
N/A

Relative:
Lower

Actual:
397 ft.

WIP:
Region: 4
File Number: 108.1212
File Status: Not reported
Staff: UNIDENTIFIED
Facility Suite: A

O108
WSW
1/4-1/2
0.457 mi.
2414 ft.

COMPOSITE STRUCTURES
13800 LIVE OAK AVE BLDG F
BALDWIN PARK, CA 91706
Site 1 of 2 in cluster O

RCRA-SQG **1000593344**
FINDS **CAD982440174**

Relative:
Lower

Actual:
404 ft.

RCRA-SQG:
Date form received by agency: 03/25/1991
Facility name: COMPOSITE STRUCTURES
Facility address: 13800 LIVE OAK AVE BLDG F
BALDWIN PARK, CA 91706
EPA ID: CAD982440174
Mailing address: 801 ROYAL OAK DR
MONROVIA, CA 91016
Contact: ENVIRONMENTAL MANAGER
Contact address: 13800 LIVE OAK AVE BLDG F
BALDWIN PARK, CA 91706
Contact country: US
Contact telephone: (818) 358-3211
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: ALCOA COMPOSITES INC
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212

COMPOSITE STRUCTURES (Continued) **1000593344**

Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: Unknown
Mixed waste (haz. and radioactive): Unknown
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: Unknown
Furnace exemption: Unknown
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002813028

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O109 **THOMAS &BETTS** **WIP** **S106767260**
WSW **13700 LIVE OAK AVE** **N/A**
1/4-1/2 **IRWINDALE, CA 91706**
0.463 mi.
2445 ft. **Site 2 of 2 in cluster O**

Relative:
Lower

Actual:
406 ft.

WIP:
Region: 4
File Number: 108.1584
File Status: Historical
Staff: UNIDENTIFIED
Facility Suite: Not reported

N110 **CORDIS WEBSTER INC** **HAZNET** **S103662984**
SW **5114 COMMERCE DR** **WIP** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.468 mi.
2473 ft. **Site 2 of 3 in cluster N**

Relative:
Lower

Actual:
397 ft.

HAZNET:
Gepaid: CAL000113107
Contact: CORDIS CORPORATION
Telephone: 3058242000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5114 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917061450
Gen County: Los Angeles
TSD EPA ID: CAD050806850
TSD County: Los Angeles
Waste Category: Other inorganic solid waste
Disposal Method: Transfer Station
Tons: 0.005
Facility County: Los Angeles

Gepaid: CAL000113107
Contact: CORDIS CORPORATION
Telephone: 3058242000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5114 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917061450
Gen County: Los Angeles
TSD EPA ID: CAD050806850
TSD County: Los Angeles
Waste Category: Unspecified organic liquid mixture
Disposal Method: Transfer Station
Tons: 1.4843
Facility County: Los Angeles

Gepaid: CAL000113107
Contact: CORDIS CORPORATION
Telephone: 3058242000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5114 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917061450
Gen County: Los Angeles
TSD EPA ID: CAD050806850
TSD County: Los Angeles

CORDIS WEBSTER INC (Continued) **S103662984**

Waste Category: Other organic solids
Disposal Method: Transfer Station
Tons: 0.09
Facility County: Los Angeles

Gepaid: CAL000113107
Contact: CORDIS CORPORATION
Telephone: 3058242000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5114 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917061450
Gen County: Los Angeles
TSD EPA ID: CAD050806850
TSD County: Los Angeles
Waste Category: Laboratory waste chemicals
Disposal Method: Transfer Station
Tons: 0.2867
Facility County: Los Angeles

Gepaid: CAL000113107
Contact: CORDIS CORPORATION
Telephone: 3058242000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 5114 COMMERCE DR
Mailing City,St,Zip: BALDWIN PARK, CA 917061450
Gen County: Los Angeles
TSD EPA ID: UTD981552177
TSD County: 99
Waste Category: Laboratory waste chemicals
Disposal Method: Not reported
Tons: 0.1625
Facility County: Los Angeles

Click this hyperlink while viewing on your computer to access
4 additional CA_HAZNET: record(s) in the EDR Site Report.

WIP:
Region: 4
File Number: 108.1211
File Status: Historical
Staff: WLIU
Facility Suite: Not reported

M111 **ARROW FUEL SERVICE** **UST** **U004049170**
NW **1580 ARROW HWY** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.476 mi.
2513 ft. **Site 2 of 5 in cluster M**

Relative:
Higher

Actual:
436 ft.

UST:
Global ID: 1810
Latitude: 34.11384
Longitude: -117.97179

M112 **ARROW FIELD SERVICE** **LUST** **S102424661**
NW **1580 ARROW HWY** **WIP** **N/A**
1/4-1/2 **IRWINDALE, CA 91706** **HIST CORTESE**
0.476 mi.
2513 ft. **Site 3 of 5 in cluster M**

Relative:
Higher

Actual:
436 ft.

LUST:

Region:	STATE
Global Id:	T0603700055
Latitude:	34.1069823
Longitude:	-117.9341699
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	1990-09-06 00:00:00
Lead Agency:	LOS ANGELES COUNTY
Case Worker:	Not reported
Local Agency:	LOS ANGELES COUNTY
RB Case Number:	014225
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminats of Concern:	Gasoline
Site History:	Not reported

LUST REG 4:

Region:	4	
Regional Board:	04	
County:	Los Angeles	
facid:	014225	
Status:	Case Closed	
Substance:	Gasoline	
Substance Quantity:	Not reported	
Local Case No:	Not reported	
Case Type:	Soil	
Abatement Method Used at the Site:		Not reported
Global ID:	T0603700055	
W Global ID:	Not reported	
Staff:	UNK	
Local Agency:	19000	
Cross Street:	Not reported	
Enforcement Type:	Not reported	
Date Leak Discovered:	Not reported	
Date Leak First Reported:		1/19/1990
Date Leak Record Entered:	2/10/1990	
Date Confirmation Began:	1/9/1990	
Date Leak Stopped:	Not reported	
Date Case Last Changed on Database:		9/6/1990
Date the Case was Closed:		9/6/1990
How Leak Discovered:	Not reported	
How Leak Stopped:	Not reported	
Cause of Leak:	Not reported	
Leak Source:	Not reported	
Operator:	BARRON, RAY	
Water System:	Not reported	
Well Name:	Not reported	
Approx. Dist To Production Well (ft):		2557.3568935409785440373061121
Source of Cleanup Funding:		Not reported
Preliminary Site Assessment Workplan Submitted:		Not reported
Preliminary Site Assessment Began:		Not reported

ARROW FIELD SERVICE (Continued) **S102424661**

Pollution Characterization Began:	Not reported
Remediation Plan Submitted:	Not reported
Remedial Action Underway:	Not reported
Post Remedial Action Monitoring Began:	Not reported
Enforcement Action Date:	Not reported
Historical Max MTBE Date:	Not reported
Hist Max MTBE Conc in Groundwater:	Not reported
Hist Max MTBE Conc in Soil:	Not reported
Significant Interim Remedial Action Taken:	Not reported
GW Qualifier:	Not reported
Soil Qualifier:	Not reported
Organization:	Not reported
Owner Contact:	Not reported
Responsible Party:	ARROW FIELD SERVICE
RP Address:	1009 MUSCATEL AVENUE, N., ROSEMEAD, 91770
Program:	LUST
Lat/Long:	34.1069823 / -1
Local Agency Staff:	Not reported
Beneficial Use:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Suspended:	Not reported
Assigned Name:	Not reported
Summary:	Not reported

WIP:

Region:	4
File Number:	108.1615
File Status:	**Historical**
Staff:	UNIDENTIFIED
Facility Suite:	Not reported

CORTESE:

Region:	CORTESE
Facility County Code:	19
Reg By:	LTNKA
Reg Id:	014225

M113 **ARROW FIELD SREVICE** **LOS ANGELES CO. HMS** **S102057951**
NW **1580 E ARROW HWY** **EMI** **N/A**
1/4-1/2 **IRWINDALE, CA** **SWEEPS UST**
0.476 mi.
2513 ft. **Site 4 of 5 in cluster M**

Relative:
Higher

Actual:
436 ft.

LOS ANGELES CO. HMS:

Region:	LA
Facility Id:	013792-014225
Facility Status:	Permit
Area:	3S
Permit Number:	76259
Permit Status:	Permit
Facility Type:	T0

EMI:

Year:	1990
County Code:	19

ARROW FIELD SREVICE (Continued) **S102057951**

Air Basin:	SC
Facility ID:	63049
Air District Name:	SC
SIC Code:	3714
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	2
Reactive Organic Gases Tons/Yr:	1
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1993
County Code:	19
Air Basin:	SC
Facility ID:	63049
Air District Name:	SC
SIC Code:	3714
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	5
Reactive Organic Gases Tons/Yr:	3
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1995
County Code:	19
Air Basin:	SC
Facility ID:	63049
Air District Name:	SC
SIC Code:	3714
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	5
Reactive Organic Gases Tons/Yr:	3
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

SWEEPS UST:

Status:	A
Comp Number:	14225
Number:	9
Board Of Equalization:	Not reported
Ref Date:	06-30-89
Act Date:	Not reported
Created Date:	06-30-89

ARROW FIELD SREVICE (Continued) **S102057951**

Tank Status:	Not reported
Owner Tank Id:	Not reported
Swrcb Tank Id:	Not reported
Actv Date:	Not reported
Capacity:	Not reported
Tank Use:	Not reported
Stg:	Not reported
Content:	Not reported
Number Of Tanks:	Not reported

M114 **GOMEZ TRUCK SERVICE** **RCRA-SQG 1000686388**
NW **1580 E ARROW HWY** **FINDS CAD983636713**
1/4-1/2 **IRWINDALE, CA 91706**
0.476 mi.
2513 ft. **Site 5 of 5 in cluster M**

Relative:
Higher

Actual:
436 ft.

RCRA-SQG:

Date form received by agency:	08/19/1992
Facility name:	GOMEZ TRUCK SERVICE
Facility address:	1580 E ARROW HWY IRWINDALE, CA 91706
EPA ID:	CAD983636713
Contact:	PEDRO GOMEZ
Contact address:	14711 CRANBROOK AVE HAWTHORNE, CA 90250
Contact country:	US
Contact telephone:	(310) 679-8670
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	RAY BARRON
Owner/operator address:	1580 E ARROW HWY IRWINDALE, CA 91706
Owner/operator country:	Not reported
Owner/operator telephone:	(310) 679-8440
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	Unknown
Mixed waste (haz. and radioactive):	Unknown
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	Unknown
Furnace exemption:	Unknown
Used oil fuel burner:	No

GOMEZ TRUCK SERVICE (Continued) **1000686388**

Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002876610

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P115 **CORONET CERAMICS, INC.** **WIP** **S106767101**
ESE **14520 JOANBRIDGE ST** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.480 mi.
2537 ft. **Site 1 of 2 in cluster P**

Relative:
Higher

Actual:
431 ft.

WIP:
Region: 4
File Number: 108.1346
File Status: **Historical**
Staff: DKOO
Facility Suite: Not reported

Q116 **MB TRUCKING** **RCRA-NonGen** **1008402412**
NW **13537 LIVE OAK LANE** **CAR000164921**
1/4-1/2 **IRWINDALE, CA 91706**
0.482 mi.
2543 ft. **Site 1 of 4 in cluster Q**

Relative:
Higher

Actual:
420 ft.

RCRA-NonGen:
Date form received by agency: 08/12/2005
Facility name: MB TRUCKING
Facility address: 13537 LIVE OAK LANE
IRWINDALE, CA 91706
EPA ID: CAR000164921
Mailing address: 311 QUIET HILLS RD
PHILLIPS RANCH, CA 91766
Contact: MARVIN E MARROQUIN
Contact address: 311 QUIET HILLS RD
PHILLIPS RANCH, CA 91766
Contact country: US
Contact telephone: 951-545-9278
Contact email: Not reported
EPA Region: 09

MB TRUCKING (Continued) **1008402412**

Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: MB TRUCKING
Owner/operator address: 31 QUIET HILLS RD
PHILLIPS RANCH, CA 91766
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 09/09/2004
Owner/Op end date: Not reported

Owner/operator name: MARVIN MARROQUIN
Owner/operator address: Not reported
Not reported
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 08/08/2005
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: Yes
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Violation Status: No violations found

R117 **GOODWAY ELECTRICAL CO. (USA)** **WIP** **S106766904**
East **14506 ARROW HWY** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.484 mi.
2556 ft. **Site 1 of 2 in cluster R**

Relative:
Higher

Actual:
436 ft.

WIP:
Region: 4
File Number: 108.1051
File Status: Historical
Staff: DKOO
Facility Suite: Not reported

N118 **OTTING ENTERPRISES** **HAZNET** **S106767268**
SW **5104 COMMERCE DR** **WIP** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.491 mi.
2590 ft. **Site 3 of 3 in cluster N**

Relative:
Lower

Actual:
395 ft.

HAZNET:

Gepaid:	CAC002563193
Contact:	LARRY OTTING
Telephone:	6263382116
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	1534 COMMERCE DR
Mailing City,St,Zip:	BALDWIN PARK, CA 91706
Gen County:	Los Angeles
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Unspecified oil-containing waste
Disposal Method:	Recycler
Tons:	0.22
Facility County:	Los Angeles

WIP:

Region:	4
File Number:	108.1593
File Status:	**Historical**
Staff:	WLIU
Facility Suite:	Not reported

P119 **TENNER CAL CONSTRUCTION** **HAZNET** **S102062963**
ESE **14530 JOANBRIDGE ST** **WIP** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706** **SWEEPS UST**
0.493 mi.
2603 ft. **Site 2 of 2 in cluster P**

Relative:
Higher

Actual:
431 ft.

HAZNET:

Gepaid:	CAL000073771
Contact:	TERRA-CAL CONSTRUCTION INC
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	PO BOX 1549
Mailing City,St,Zip:	BALDWIN PARK, CA 917067549
Gen County:	Los Angeles
TSD EPA ID:	CAD981696420
TSD County:	Los Angeles
Waste Category:	Waste oil and mixed oil
Disposal Method:	Transfer Station
Tons:	5.4210
Facility County:	Los Angeles

Gepaid:	CAL000073771
Contact:	EMMANUEL MARANGAKIS
Telephone:	6264727878
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14530 JOANBRIDGE ST
Mailing City,St,Zip:	BALDWIN PARK, CA 917060000
Gen County:	Los Angeles

TENNER CAL CONSTRUCTION (Continued) **S102062963**

TSD EPA ID: Not reported
TSD County: 99
Waste Category: Unspecified solvent mixture Waste
Disposal Method: Recycler
Tons: 0.57
Facility County: Not reported

Gepaid: CAL000073771
Contact: EMMANUEL MARANGAKIS
Telephone: 6264727878
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14530 JOANBRIDGE ST
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: Not reported
TSD County: 99
Waste Category: Waste oil and mixed oil
Disposal Method: Recycler
Tons: 0.12
Facility County: Not reported

Gepaid: CAL000073771
Contact: EMMANUEL MARANGAKIS
Telephone: 6264727878
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14530 JOANBRIDGE ST
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: Not reported
TSD County: 99
Waste Category: Off-specification, aged, or surplus organics
Disposal Method: Disposal, Land Fill
Tons: 0.10
Facility County: Not reported

Gepaid: CAL000073771
Contact: EMMANUEL MARANGAKIS
Telephone: 6264727878
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14530 JOANBRIDGE ST
Mailing City,St,Zip: BALDWIN PARK, CA 917060000
Gen County: Los Angeles
TSD EPA ID: Not reported
TSD County: 99
Waste Category: Off-specification, aged, or surplus organics
Disposal Method: Treatment, Incineration
Tons: 0.20
Facility County: Not reported

Click this hyperlink while viewing on your computer to access
5 additional CA_HAZNET: record(s) in the EDR Site Report.

WIP:
Region: 4

TENNER CAL CONSTRUCTION (Continued) **S102062963**

File Number: 108.1347
File Status: Historical
Staff: DKOO
Facility Suite: Not reported

SWEEPS UST:
Status: Not reported
Comp Number: 14924
Number: Not reported
Board Of Equalization: Not reported
Ref Date: Not reported
Act Date: Not reported
Created Date: Not reported
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-014924-000001
Actv Date: Not reported
Capacity: 1000
Tank Use: M.V. FUEL
Stg: PRODUCT
Content: DIESEL
Number Of Tanks: 2

Status: Not reported
Comp Number: 14924
Number: Not reported
Board Of Equalization: Not reported
Ref Date: Not reported
Act Date: Not reported
Created Date: Not reported
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-014924-000002
Actv Date: Not reported
Capacity: 1000
Tank Use: M.V. FUEL
Stg: PRODUCT
Content: REG UNLEADED
Number Of Tanks: Not reported

R120 **ABC TEA HOUSE** **WIP** **S106766909**
East **14520 ARROW HWY** **N/A**
1/4-1/2 **BALDWIN PARK, CA 91706**
0.495 mi.
2613 ft. **Site 2 of 2 in cluster R**

Relative:
Higher

Actual:
436 ft.

WIP:
Region: 4
File Number: 108.1061
File Status: Historical
Staff: DKOO
Facility Suite: Not reported

Q121 **LIVINGSTON-GRAHAM INC** **SWF/LF** **S102360630**
NW **13550 LIVE OAK AV** **EMI** **N/A**
1/4-1/2 **IRWINDALE, CA 91706**
0.496 mi.
2618 ft. **Site 2 of 4 in cluster Q**

Relative:
Higher

Actual:
422 ft.

SWF/LF:

Region:	STATE
Facility ID:	19-AA-0044
Lat/Long:	34.1122 / -117.98308
Owner Name:	Hanson Aggregates West, Inc.
Owner Telephone:	6268566717
Owner Address:	Kevin Everly
Owner Address2:	13550 Live Oak Abenue
Owner City,St,Zip:	Irwindale, CA 91706-1318
Operator:	Hanson Aggregates West, Inc
Operator Phone:	6268566717
Operator Address:	Bryan Forgey, Manager
Operator Address2:	13550 Live Oak Avenue
Operator City,St,Zip:	Irwindale, CA 91706-1318
Operator's Status:	Active
Permit Date:	7/7/2006
Permit Status:	Notification
Permitted Acreage:	0
Activity:	Inert Debris ENG Fill Operation
Regulation Status:	Notification
Landuse Name:	Residential,Commercial
GIS Source:	Map
Category:	Disposal
Unit Number:	01
Inspection Frequency:	Quarterly
Accepted Waste:	Inert
Closure Date:	8/1/2019
Closure Type:	Estimated
Disposal Acreage:	40
Swisnumber:	19-AA-0044
Issue & Observations:	Irwindale, CA 91706-1318
Program Type:	Not reported
Permitted Throughput with Units:	1600
Actual Throughput with Units:	Tons/day
Permitted Capacity with Units:	205000
Remaining Capacity:	Not reported
Remaining Capacity with Units:	Tons/year

EMI:

Year:	1990
County Code:	19
Air Basin:	SC
Facility ID:	58815
Air District Name:	SC
SIC Code:	5082
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0

LIVINGSTON-GRAHAM INC (Continued) **S102360630**

Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0
Year:	1990
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	3273
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	9
Reactive Organic Gases Tons/Yr:	6
Carbon Monoxide Emissions Tons/Yr:	19
NOX - Oxides of Nitrogen Tons/Yr:	49
SOX - Oxides of Sulphur Tons/Yr:	3
Particulate Matter Tons/Yr:	10
Part. Matter 10 Micrometers & Smllr Tons/Yr:	10
Year:	1995
County Code:	19
Air Basin:	SC
Facility ID:	58815
Air District Name:	SC
SIC Code:	5082
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0
Year:	1995
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	1
Carbon Monoxide Emissions Tons/Yr:	10
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	6
Part. Matter 10 Micrometers & Smllr Tons/Yr:	5

Q122 **BLUE DIAMOND MATERIALS** **EMI** **S105938017**
NW **13550 LIVE OAK AVE** **SWEEPS UST** **N/A**
1/4-1/2 **IRWINDALE, CA**
0.496 mi.
2618 ft. **Site 3 of 4 in cluster Q**

Relative:
Higher

Actual:
422 ft.

EMI:

Year:	1996
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	14
Part. Matter 10 Micrometers & Smllr Tons/Yr:	13

Year:	1997
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	13
Part. Matter 10 Micrometers & Smllr Tons/Yr:	1

Year:	1998
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	13
Part. Matter 10 Micrometers & Smllr Tons/Yr:	1

Year:	1999

BLUE DIAMOND MATERIALS (Continued) **S105938017**

County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	13
Part. Matter 10 Micrometers & Smllr Tons/Yr:	1

Year:	2000
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	13
Part. Matter 10 Micrometers & Smllr Tons/Yr:	1

Year:	2002
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	3
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	15
Part. Matter 10 Micrometers & Smllr Tons/Yr:	2

Year:	2003
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD

BLUE DIAMOND MATERIALS (Continued) **S105938017**

Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	3
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	15
Part. Matter 10 Micrometers & Smllr Tons/Yr:	2

Year:	2004
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.2627874
Reactive Organic Gases Tons/Yr:	0.25
Carbon Monoxide Emissions Tons/Yr:	2.724804
NOX - Oxides of Nitrogen Tons/Yr:	0.18412
SOX - Oxides of Sulphur Tons/Yr:	0.005767
Particulate Matter Tons/Yr:	15.3649366
Part. Matter 10 Micrometers & Smllr Tons/Yr:	1.59

Year:	2005
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	.56294
Reactive Organic Gases Tons/Yr:	.51827733
Carbon Monoxide Emissions Tons/Yr:	8.058
NOX - Oxides of Nitrogen Tons/Yr:	1.025
SOX - Oxides of Sulphur Tons/Yr:	.023
Particulate Matter Tons/Yr:	15.5168
Part. Matter 10 Micrometers & Smllr Tons/Yr:	7.796131

SWEEPS UST:

Status:	A
Comp Number:	538
Number:	9
Board Of Equalization:	Not reported
Ref Date:	06-30-89
Act Date:	Not reported
Created Date:	06-30-89
Tank Status:	A
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-000538-000001
Actv Date:	06-30-89
Capacity:	Not reported

BLUE DIAMOND MATERIALS (Continued) **S105938017**

Tank Use: UNKNOWN
Stg: W
Content: Not reported
Number Of Tanks: 10

Status: A
Comp Number: 538
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-000538-000002
Actv Date: 06-30-89
Capacity: Not reported
Tank Use: UNKNOWN
Stg: W
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 538
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-000538-000003
Actv Date: 06-30-89
Capacity: Not reported
Tank Use: UNKNOWN
Stg: W
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 538
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-000538-000004
Actv Date: 06-30-89
Capacity: Not reported
Tank Use: UNKNOWN
Stg: W
Content: Not reported
Number Of Tanks: Not reported

Status: A

BLUE DIAMOND MATERIALS (Continued) **S105938017**

Comp Number: 538
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-000538-000005
Actv Date: 06-30-89
Capacity: Not reported
Tank Use: UNKNOWN
Stg: W
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 538
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-000538-000006
Actv Date: 06-30-89
Capacity: Not reported
Tank Use: UNKNOWN
Stg: W
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 538
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 19-000-000538-000007
Actv Date: 06-30-89
Capacity: Not reported
Tank Use: UNKNOWN
Stg: W
Content: Not reported
Number Of Tanks: Not reported

Status: A
Comp Number: 538
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89

BLUE DIAMOND MATERIALS (Continued) **S105938017**

Tank Status:	A
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-000538-000008
Actv Date:	06-30-89
Capacity:	Not reported
Tank Use:	UNKNOWN
Stg:	W
Content:	Not reported
Number Of Tanks:	Not reported

Status:	A
Comp Number:	538
Number:	9
Board Of Equalization:	Not reported
Ref Date:	06-30-89
Act Date:	Not reported
Created Date:	06-30-89
Tank Status:	A
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-000538-000009
Actv Date:	06-30-89
Capacity:	Not reported
Tank Use:	UNKNOWN
Stg:	W
Content:	Not reported
Number Of Tanks:	Not reported

Status:	A
Comp Number:	538
Number:	9
Board Of Equalization:	Not reported
Ref Date:	06-30-89
Act Date:	Not reported
Created Date:	06-30-89
Tank Status:	A
Owner Tank Id:	Not reported
Swrcb Tank Id:	19-000-000538-000010
Actv Date:	06-30-89
Capacity:	Not reported
Tank Use:	UNKNOWN
Stg:	W
Content:	Not reported
Number Of Tanks:	Not reported

Q123 **LIVINGSTON-GRAHAM** **HAZNET** **1001613380**
NW **13550 LIVE OAK AVE** **LUST** **N/A**
1/4-1/2 **IRWINDALE, CA 91706** **LOS ANGELES CO. HMS**
0.496 mi. **EMI**
2618 ft. **Site 4 of 4 in cluster Q** **WIP**
NPDES

Relative: Higher

Actual: 422 ft.

HAZNET:

Gepaid:	CAC002556388
Contact:	LAUREL BOEHM
Telephone:	6303052472
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	1 NALCO CTR

LIVINGSTON-GRAHAM (Continued) **1001613380**

Mailing City,St,Zip:	NAPERVILLE, IL 60563
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	Kern
Waste Category:	Off-specification, aged, or surplus inorganics
Disposal Method:	Disposal, Land Fill
Tons:	13.48
Facility County:	Not reported

Gepaid:	CAL000067430
Contact:	LIVINGSTON-GRAHAM
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	16080 ARROW HWY
Mailing City,St,Zip:	IRWINDALE, CA 917060000
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	0
Waste Category:	Waste oil and mixed oil
Disposal Method:	Recycler
Tons:	.6255
Facility County:	Los Angeles

Gepaid:	CAL000082657
Contact:	TOM FERRELL
Telephone:	8585772772
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	PO BOX 639069
Mailing City,St,Zip:	SAN DIEGO, CA 921639069
Gen County:	Los Angeles
TSD EPA ID:	CAT000613893
TSD County:	Los Angeles
Waste Category:	Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method:	Transfer Station
Tons:	0.18
Facility County:	Los Angeles

Gepaid:	CAL000082657
Contact:	TOM FERRELL
Telephone:	8585772772
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	PO BOX 639069
Mailing City,St,Zip:	SAN DIEGO, CA 921639069
Gen County:	Los Angeles
TSD EPA ID:	CAL000103864
TSD County:	Los Angeles
Waste Category:	Other organic solids
Disposal Method:	Transfer Station
Tons:	0.08
Facility County:	Los Angeles

Gepaid:	CAL000082657
Contact:	TOM FERRELL
Telephone:	8585772772

LIVINGSTON-GRAHAM (Continued) **1001613380**

Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: PO BOX 639069
Mailing City,St,Zip: SAN DIEGO, CA 921639069
Gen County: Los Angeles
TSD EPA ID: CAT000613893
TSD County: Los Angeles
Waste Category: Not reported
Disposal Method: Transfer Station
Tons: Not reported
Facility County: Los Angeles

Click this hyperlink while viewing on your computer to access
5 additional CA_HAZNET: record(s) in the EDR Site Report.

LUST:
Region: STATE
Global Id: T0603704534
Latitude: 34.108581
Longitude: -117.9796785
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 1996-05-22 00:00:00
Lead Agency: LOS ANGELES COUNTY
Case Worker: Not reported
Local Agency: LOS ANGELES COUNTY
RB Case Number: R-00538
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Soil
Potential Contaminats of Concern: Other Solvent or Non-Petroleum Hydrocarbon
Site History: Not reported

LUST REG 4:
Region: 4
Regional Board: 04
County: Los Angeles
facid: R-00538
Status: Case Closed
Substance: Hydrocarbons
Substance Quantity: Not reported
Local Case No: Not reported
Case Type: Soil
Abatement Method Used at the Site: Excavate and Dispose
Global ID: T0603704534
W Global ID: Not reported
Staff: UNK
Local Agency: 19000
Cross Street: Not reported
Enforcement Type: Not reported
Date Leak Discovered: 5/13/1996
Date Leak First Reported: 5/22/1996
Date Leak Record Entered: 6/14/1996
Date Confirmation Began: Not reported
Date Leak Stopped: 3/6/1996
Date Case Last Changed on Database: 12/17/1996

LIVINGSTON-GRAHAM (Continued) **1001613380**

Date the Case was Closed:		5/22/1996
How Leak Discovered:	Tank Closure	
How Leak Stopped:	Not reported	
Cause of Leak:	Not reported	
Leak Source:	Not reported	
Operator:	SJOBERG, CARL	
Water System:	Not reported	
Well Name:	Not reported	
Approx. Dist To Production Well (ft):		3324.377279076157359688113411 9
Source of Cleanup Funding:		Not reported
Preliminary Site Assessment Workplan Submitted:		Not reported
Preliminary Site Assessment Began:		Not reported
Pollution Characterization Began:		Not reported
Remediation Plan Submitted:		Not reported
Remedial Action Underway:		Not reported
Post Remedial Action Monitoring Began:		Not reported
Enforcement Action Date:		Not reported
Historical Max MTBE Date:		Not reported
Hist Max MTBE Conc in Groundwater:		Not reported
Hist Max MTBE Conc in Soil:		Not reported
Significant Interim Remedial Action Taken:		Not reported
GW Qualifier:	Not reported	
Soil Qualifier:	Not reported	
Organization:	Not reported	
Owner Contact:	Not reported	
Responsible Party:	LIVINGSTON-GRAHAM	
RP Address:	13550 E LIVE OAK AVE, IRWINDALE CA 91706	
Program:	LUST	
Lat/Long:	34.108581 / -1	
Local Agency Staff:	Not reported	
Beneficial Use:	Not reported	
Priority:	Not reported	
Cleanup Fund Id:	Not reported	
Suspended:	Not reported	
Assigned Name:	Not reported	
Summary:	Not reported	

LOS ANGELES CO. HMS:

Region:	LA
Facility Id:	000535-I00538
Facility Status:	Permit
Area:	3S
Permit Number:	75371
Permit Status:	Removed
Facility Type:	I09

Region:	LA
Facility Id:	000535-023921
Facility Status:	Permit
Area:	3S
Permit Number:	271805
Permit Status:	Permit
Facility Type:	I05

Region:	LA
Facility Id:	000535-000538
Facility Status:	Permit

LIVINGSTON-GRAHAM (Continued) **1001613380**

Area: 3S
Permit Number: 00004660T
Permit Status: Closed
Facility Type: T0

Region: LA
Facility Id: 000535-043591
Facility Status: OPEN
Area: 3S
Permit Number: Not reported
Permit Status: Not reported
Facility Type: Not reported

Region: LA
Facility Id: 000535-040839
Facility Status: Permit
Area: 3S
Permit Number: 456760
Permit Status: Permit
Facility Type: T0

Region: LA
Facility Id: 000535-048714
Facility Status: Permit
Area: 3S
Permit Number: CGI020379
Permit Status: Permit
Facility Type: SS6

EMI:

Year:	2006
County Code:	19
Air Basin:	SC
Facility ID:	20774
Air District Name:	SC
SIC Code:	1442
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	.9478581960244545540
Reactive Organic Gases Tons/Yr:	.634
Carbon Monoxide Emissions Tons/Yr:	8.629
NOX - Oxides of Nitrogen Tons/Yr:	.946
SOX - Oxides of Sulphur Tons/Yr:	.022
Particulate Matter Tons/Yr:	27.048
Part. Matter 10 Micrometers & Smllr Tons/Yr:	13.559228

WIP:
Region: 4
File Number: 106.2098
File Status: Historical
Staff: UNIDENTIFIED
Facility Suite: Not reported

Region: 4
File Number: 106.2100

LIVINGSTON-GRAHAM (Continued) **1001613380**

File Status: **Historical**
Staff: DRASMUSS
Facility Suite: Not reported

NPDES:

Npdes Number:	Not reported
Facility Status:	Active
Agency Id:	486758
Region:	4
Regulatory Measure Id:	306882
Order No:	Not reported
Order No Of General Order:	97-03-DWQ
Regulatory Measure Type:	Storm water industrial
Place Id:	637951
WDID:	4 19I020379
Program Type:	INDSTW
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	7/28/2006 9:57:13 AM
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Hanson Aggregates West
Discharge Address:	PO Box 7804
Discharge Address2:	Not reported
Discharge City:	Baldwin Park
Discharge State:	CA
Discharge Zip:	91706

124
ESE
1/2-1
0.554 mi.
2928 ft.

Relative:
Higher

Actual:
433 ft.

ALLAN COMPANY **LUST** **S106915989**
14620 EAST JOANBRIDGE STREET **N/A**
BALDWIN PARK, CA 91706

LUST:

Region:	STATE
Global Id:	T0603712387
Latitude:	34.105277
Longitude:	-117.957022
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	2007-07-30 00:00:00
Lead Agency:	LOS ANGELES COUNTY
Case Worker:	Not reported
Local Agency:	LOS ANGELES COUNTY
RB Case Number:	Not reported
LOC Case Number:	11623-11675
File Location:	Not reported
Potential Media Affect:	Under Investigation
Potential Contaminats of Concern:	Diesel
Site History:	Not reported

S125 **ALLAN COMPANY BALDWIN PARK** **SWF/LF** **S109167807**
East **14604-14618 ARROW HIGHWAY** **N/A**
1/2-1 **BALDWIN PARK, CA**
0.560 mi.
2955 ft. **Site 1 of 3 in cluster S**

Relative:
Higher

Actual:
437 ft.

SWF/LF:

Region:	STATE
Facility ID:	19-AA-1110
Lat/Long:	34.10648 / -117.9567
Owner Name:	Cedarwood-Young DBA Alan Company
Owner Telephone:	6269624047
Owner Address:	Rich Hubbard or Joe Person
Owner Address2:	14620 Joanbridge Street
Owner City,St,Zip:	Baldwin Park, CA 91706
Operator:	Cedarwood-Young DBA Alan Company
Operator Phone:	6269624047
Operator Address:	Rich Hubbard or Joe Person
Operator Address2:	14620 Joanbridge Street
Operator City,St,Zip:	Baldwin Park, CA 91706
Operator's Status:	Active
Permit Date:	8/11/2008
Permit Status:	Permitted
Permitted Acreage:	3.1
Activity:	Large Volume Transfer/Proc Facility
Regulation Status:	Permitted
Landuse Name:	Recreational - Irrigated,Industrial,Commercial
GIS Source:	Map
Category:	Transfer/Processing
Unit Number:	01
Inspection Frequency:	Monthly
Accepted Waste:	Mixed municipal
Closure Date:	Not reported
Closure Type:	Not reported
Disposal Acreage:	Not reported
Swisnumber:	19-AA-1110
Issue & Observations:	Baldwin Park, CA 91706
Program Type:	1473 Temp. Pmt.
Permitted Throughput with Units:	555
Actual Throughput with Units:	Tons/day
Permitted Capacity with Units:	960
Remaining Capacity:	Not reported
Remaining Capacity with Units:	Tons/day

S126 **ALLAN CO** **FINDS** **1000686145**
East **14618 ARROW HWY** **HAZNET** **CAD983633785**
1/2-1 **BALDWIN PARK, CA 91706** **SWRCY**
0.573 mi. **WIP**
3024 ft. **Site 2 of 3 in cluster S** **RCRA-NonGen**
CA WDS

Relative:
Higher

Actual:
438 ft.

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002874596

California - Hazardous Waste Tracking System - Datamart

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of

ALLAN CO (Continued) **1000686145**

events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZNET:

Gepaid:	CAD983633785
Contact:	CEDARWOOD YOUNG DBA ALLAN CO
Telephone:	6269624047
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14618 ARROW HWY
Mailing City,St,Zip:	BALDWIN PARK, CA 917061796
Gen County:	Los Angeles
TSD EPA ID:	CAT000613893
TSD County:	Los Angeles
Waste Category:	Unspecified organic liquid mixture
Disposal Method:	Transfer Station
Tons:	1.1628
Facility County:	Los Angeles

Gepaid:	CAD983633785
Contact:	--
Telephone:	6269624047
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14618 ARROW HWY
Mailing City,St,Zip:	BALDWIN PARK, CA 917061796
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	Los Angeles
Waste Category:	Aqueous solution with less than 10% total organic residues
Disposal Method:	Transfer Station
Tons:	0.16
Facility County:	Not reported

Gepaid:	CAD983633785
Contact:	--
Telephone:	6269624047
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	14618 ARROW HWY
Mailing City,St,Zip:	BALDWIN PARK, CA 917061796
Gen County:	Los Angeles
TSD EPA ID:	Not reported
TSD County:	Los Angeles
Waste Category:	Other organic solids
Disposal Method:	Disposal, Land Fill
Tons:	1
Facility County:	Not reported

Gepaid:	CAD983633785
Contact:	RICH HUBBARD MANAGER
Telephone:	6269624047
Facility Addr2:	Not reported
Mailing Name:	Not reported

ALLAN CO (Continued) **1000686145**

Mailing Address: 14618 ARROW HWY
Mailing City,St,Zip: BALDWIN PARK, CA 917061796
Gen County: Los Angeles
TSD EPA ID: AZR000501510
TSD County: Not reported
Waste Category: Other organic solids
Disposal Method: H141
Tons: 0.67
Facility County: Los Angeles

Gepaid: CAD983633785
Contact: RICH HUBBARD MANAGER
Telephone: 6269624047
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 14618 ARROW HWY
Mailing City,St,Zip: BALDWIN PARK, CA 917061796
Gen County: Los Angeles
TSD EPA ID: CAD097030993
TSD County: Los Angeles
Waste Category: Other organic solids
Disposal Method: H141
Tons: 1.2
Facility County: Los Angeles

Click this hyperlink while viewing on your computer to access
36 additional CA_HAZNET: record(s) in the EDR Site Report.

SWRCY:
Certification Status: O
Facility Phone Number: (626) 962-4047
Date facility became certified: 8/19/1987
Date facility began operating: 9/1/1965
Date facility ceased operating: Still operating
Whether The Facility Is Grandfathered: Not reported
Convenience Zone Where Faciltiy Located: Not Accepted
Convenience Zone Where Faciltiy Located 2: Not Accepted
Convenience Zone Where Faciltiy Located 3: Not Accepted
Convenience Zone Where Faciltiy Located 4: Not Accepted
Convenience Zone Where Faciltiy Located 5: Not Accepted
Convenience Zone Where Faciltiy Located 6: Not Accepted
Convenience Zone Where Faciltiy Located 7: Not Accepted
Aluminum Beverage Containers Redeemed: AL
Glass Beverage Containers Redeemed: GL
Plastic Beverage Containers Redeemed: PL
Other mat beverage containers redeemed: Not reported
Refillable Beverage Containers Redeemed: Not reported

WIP:
Region: 4
File Number: 108.1054
File Status: Historical
Staff: TB
Facility Suite: Not reported

ALLAN CO (Continued) **1000686145**

RCRA-NonGen:
Date form received by agency: 08/05/2005
Facility name: ALLAN CO
Facility address: 14618 E ARROW HWY
BALDWIN PARK, CA 91706
EPA ID: CAD983633785
Contact: RICH D HUBBARD
Contact address: 14618 E ARROW HWY
BALDWIN PARK, CA 91706
Contact country: US
Contact telephone: 626-255-1882
Contact email: Not reported
EPA Region: 09
Land type: Private
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: STEPHEN YOUNG AND DIANA GLASS
Owner/operator address: 14620 JOAN BRIDGE ST
BALDWIN PARK, CA 91706
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 04/10/1973
Owner/Op end date: Not reported

Owner/operator name: ALLAN CO
Owner/operator address: Not reported
Not reported
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 03/23/1963
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

ALLAN CO (Continued) **1000686145**

Historical Generators:
Date form received by agency: 04/24/1992
Facility name: ALLAN CO
Classification: Small Quantity Generator

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 05/30/2008
Date achieved compliance: 06/17/2008
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: 05/30/2008
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 01/23/2008
Date achieved compliance: 01/23/2008
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: 01/23/2008
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 05/30/2008
Evaluation: FOLLOW-UP INSPECTION
Area of violation: State Statute or Regulation
Date achieved compliance: 06/17/2008
Evaluation lead agency: State

Evaluation date: 01/23/2008
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: State Statute or Regulation
Date achieved compliance: 01/23/2008
Evaluation lead agency: State

Evaluation date: 06/21/2007
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

CA WDS:
Facility ID: 4 19I000752
Facility Type: Not reported

ALLAN CO (Continued) **1000686145**

Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board
Subregion:	4
Facility Telephone:	Not reported
Facility Contact:	Not reported
Agency Name:	ALLAN COMPANY
Agency Address:	Not reported
Agency City,St,Zip:	0
Agency Contact:	Not reported
Agency Telephone:	Not reported
Agency Type:	Not reported
SIC Code:	0
SIC Code 2:	Not reported
Primary Waste:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	Not reported
POTW:	Not reported
Treat To Water:	Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.
Complexity:	Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

S127 **CAL-MAT PROPERTIES** **LUST** **S102229654**
East **14626 ARROW HWY E** **LOS ANGELES CO. HMS** **N/A**
1/2-1 **IRWINDALE, CA 91706**
0.584 mi.
3086 ft. **Site 3 of 3 in cluster S**

Relative:
Higher

Actual:
438 ft.

LUST:

Region:	STATE
Global Id:	T0603792948
Latitude:	34.10663
Longitude:	-117.954524
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	2000-07-27 00:00:00
Lead Agency:	LOS ANGELES COUNTY
Case Worker:	Not reported
Local Agency:	LOS ANGELES COUNTY
RB Case Number:	R-15702
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminats of Concern:	Diesel

CAL-MAT PROPERTIES (Continued) **S102229654**

Site History: Not reported

LUST REG 4:

Region:	4	
Regional Board:	04	
County:	Los Angeles	
facid:	R-15702	
Status:	Case Closed	
Substance:	Diesel	
Substance Quantity:	Not reported	
Local Case No:	Not reported	
Case Type:	Soil	
Abatement Method Used at the Site:		Excavate and Dispose
Global ID:	T0603792948	
W Global ID:	Not reported	
Staff:	UNK	
Local Agency:	19000	
Cross Street:	Not reported	
Enforcement Type:	Not reported	
Date Leak Discovered:	9/26/1990	
Date Leak First Reported:		8/18/1999
Date Leak Record Entered:	Not reported	
Date Confirmation Began:	Not reported	
Date Leak Stopped:	Not reported	
Date Case Last Changed on Database:		7/27/2000
Date the Case was Closed:		7/27/2000
How Leak Discovered:	Repair Tank	
How Leak Stopped:	Not reported	
Cause of Leak:	Not reported	
Leak Source:	Tank	
Operator:	Not reported	
Water System:	Not reported	
Well Name:	Not reported	
Approx. Dist To Production Well (ft):		1952.8635446409383422261396567
Source of Cleanup Funding:		Tank
Preliminary Site Assessment Workplan Submitted:		Not reported
Preliminary Site Assessment Began:		Not reported
Pollution Characterization Began:		Not reported
Remediation Plan Submitted:		Not reported
Remedial Action Underway:		Not reported
Post Remedial Action Monitoring Began:		Not reported
Enforcement Action Date:		Not reported
Historical Max MTBE Date:		Not reported
Hist Max MTBE Conc in Groundwater:		Not reported
Hist Max MTBE Conc in Soil:		Not reported
Significant Interim Remedial Action Taken:		Not reported
GW Qualifier:	Not reported	
Soil Qualifier:	Not reported	
Organization:	Not reported	
Owner Contact:	Not reported	
Responsible Party:	CAL-MAT PROPERTIES	
RP Address:	12901 RAMONA BLVD., STE. E, IRWINDALE CA 91706	
Program:	LUST	
Lat/Long:	34.10663 / -1	
Local Agency Staff:	Not reported	
Beneficial Use:	Not reported	
Priority:	Not reported	

CAL-MAT PROPERTIES (Continued) **S102229654**

Cleanup Fund Id: Not reported
Suspended: Not reported
Assigned Name: Not reported
Summary: Not reported

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 014898-015702
Facility Status: Removed
Area: 3S
Permit Number: 266078
Permit Status: Removed
Facility Type: T1

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128 **CHEM ARROW** **Notify 65** **S100178137**
West **13643 LIVE OAK** **N/A**
1/2-1 **IRWINDALE, CA 91706**
0.607 mi.
3207 ft.

Relative:
Lower

Actual:
403 ft.

Notify 65:
Date Reported: Not reported
Staff Initials: Not reported
Board File Number: Not reported
Facility Type: Not reported
Discharge Date: Not reported
Incident Description: 91706

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129 **LONGDEN AVE DISPOSAL SITE** **SWF/LF** **S102360686**
East **201-545 LONGDEN AVENUE** **N/A**
1/2-1 **IRWINDALE, CA**
0.622 mi.
3284 ft.

Relative:
Higher

Actual:
442 ft.

SWF/LF:
Region: STATE
Facility ID: 19-AA-0587
Lat/Long: 34.1 / -118.09444
Owner Name: Five Long Oak Corp
Owner Telephone: 2133834222
Owner Address: Not reported
Owner Address2: 3500 Wilshire Blvd
Owner City,St,Zip: Los Angeles, CA 90010
Operator: Owl Park Corporation
Operator Phone: Not reported
Operator Address: Not reported
Operator Address2: 106 South Myrtle Ave
Operator City,St,Zip: Monrovia, CA
Operator's Status: Closed
Permit Date: Not reported
Permit Status: Not reported
Permitted Acreage: 0
Activity: Solid Waste Disposal Site
Regulation Status: Unpermitted
Landuse Name: Residential,Commercial
GIS Source: Map

LONGDEN AVE DISPOSAL SITE (Continued) **S102360686**

Category: Disposal
Unit Number: 01
Inspection Frequency: Quarterly
Accepted Waste: Not reported
Closure Date: 12/31/1978
Closure Type: Estimated
Disposal Acreage: 0
Swisnumber: 19-AA-0587
Issue & Observations: Monrovia, CA
Program Type: Not reported
Permitted Throughput with Units: 0
Actual Throughput with Units: Not reported
Permitted Capacity with Units: 0
Remaining Capacity: 0
Remaining Capacity with Units: Not reported

130
WNW
1/2-1
0.652 mi.
3444 ft.

NU-WAY LIVE OAK LANDFILL/WASTE MANAGEMENT, INC. **SWF/LF** **S105620403**
13620 LIVE OAK LANE **N/A**
IRWINDALE, CA 91706

Relative:
Lower

Actual:
405 ft.

SWF/LF:
Area: San Gabriel Valley
Public Notice: Yes
Restrictions: Accepts only inert waste

T131
NW
1/2-1
0.662 mi.
3495 ft.

CF MOTORFREIGHT **RCRA-SQG** **1001085558**
13645 LIVE OAK LN **FINDS** **CAR000008813**
IRWINDALE, CA 91706 **LUST**
LOS ANGELES CO. HMS
Site 1 of 2 in cluster T **HIST CORTESE**

Relative:
Lower

Actual:
403 ft.

RCRA-SQG:
Date form received by agency: 01/31/1996
Facility name: CF MOTORFREIGHT
Facility address: 13645 LIVE OAK LN
IRWINDALE, CA 91706
EPA ID: CAR000008813
Contact: JIM METZA
Contact address: 13645 LIVE OAK LN
IRWINDALE, CA 91706
Contact country: US
Contact telephone: (818) 303-2571
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: CF MOTORFREIGHT
Owner/operator address: 175 LINFIELD DR

CF MOTORFREIGHT (Continued) **1001085558**

MENLO PARK, CA 94025
Owner/operator country: Not reported
Owner/operator telephone: (415) 326-1700
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: Unknown
Mixed waste (haz. and radioactive): Unknown
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: Unknown
Furnace exemption: Unknown
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002909853

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

LUST:
Region: STATE
Global Id: T0603704015
Latitude: 34.1138529
Longitude: -117.9749893
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 2003-05-14 00:00:00
Lead Agency: LOS ANGELES COUNTY
Case Worker: Not reported
Local Agency: LOS ANGELES COUNTY
RB Case Number: I-12933
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Soil
Potential Contaminats of Concern: Diesel

CF MOTORFREIGHT (Continued) **1001085558**

Site History: Not reported

LUST REG 4:

Region:	4	
Regional Board:	04	
County:	Los Angeles	
facid:	I-12933	
Status:	Leak being confirmed	
Substance:	Diesel	
Substance Quantity:	Not reported	
Local Case No:	Not reported	
Case Type:	Soil	
Abatement Method Used at the Site:		Not reported
Global ID:	T0603704015	
W Global ID:	Not reported	
Staff:	UNK	
Local Agency:	19000	
Cross Street:	LIVE OAK AVE.	
Enforcement Type:	Not reported	
Date Leak Discovered:	8/29/1995	
Date Leak First Reported:		8/31/1995
Date Leak Record Entered:	11/27/1995	
Date Confirmation Began:	8/30/1995	
Date Leak Stopped:	8/30/1995	
Date Case Last Changed on Database:		11/27/1995
Date the Case was Closed:		Not reported
How Leak Discovered:	Inventory Control	
How Leak Stopped:	Not reported	
Cause of Leak:	UNK	
Leak Source:	Piping	
Operator:	CF MOTORFREIGHT	
Water System:	Not reported	
Well Name:	Not reported	
Approx. Dist To Production Well (ft):		4210.69427059641809505630398 17
Source of Cleanup Funding:		Piping
Preliminary Site Assessment Workplan Submitted:		Not reported
Preliminary Site Assessment Began:		Not reported
Pollution Characterization Began:		Not reported
Remediation Plan Submitted:		Not reported
Remedial Action Underway:		Not reported
Post Remedial Action Monitoring Began:		Not reported
Enforcement Action Date:		Not reported
Historical Max MTBE Date:		Not reported
Hist Max MTBE Conc in Groundwater:		Not reported
Hist Max MTBE Conc in Soil:		1.4
Significant Interim Remedial Action Taken:		Not reported
GW Qualifier:	Not reported	
Soil Qualifier:	<	
Organization:	Not reported	
Owner Contact:	Not reported	
Responsible Party:	CF MOTORFREIGHT	
RP Address:	175 LINFIELD DR., MENLO PARK, CA 94025	
Program:	LUST	
Lat/Long:	34.1138529 / -1	
Local Agency Staff:	Not reported	
Beneficial Use:	Not reported	
Priority:	Not reported	

CF MOTORFREIGHT (Continued) **1001085558**

Cleanup Fund Id: Not reported
Suspended: Not reported
Assigned Name: Not reported
Summary: Not reported

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 012741-041282
Facility Status: Permit
Area: 3S
Permit Number: 428587
Permit Status: Permit
Facility Type: IS4

Region: LA
Facility Id: 012741-012933
Facility Status: Removed
Area: 3S
Permit Number: 00004696T
Permit Status: Removed
Facility Type: T0

CORTESE:
Region: CORTESE
Facility County Code: 19
Reg By: LTNKA
Reg Id: I-12933

T132 **JONELL OIL CORP** **CERCLIS 1000204976**
NW **13649 LIVE OAK LANE** **RCRA-SQG CAD981393077**
1/2-1 **IRWINDALE, CA 91706** **FINDS**
0.668 mi. **HAZNET**
3529 ft. **Site 2 of 2 in cluster T**

Relative:
Lower

Actual:
404 ft.

CERCLIS:
Site ID: 0902311
Federal Facility: Not a Federal Facility
NPL Status: Site is Part of NPL Site
Non NPL Status: Not reported

CERCLIS Site Contact Name(s):
Contact Name: Karen Jurist
Contact Tel: (415) 972-3219
Contact Title: Site Assessment Manager (SAM)

Contact Name: Jeff Inglis
Contact Tel: (415) 972-3095
Contact Title: Site Assessment Manager (SAM)

Contact Name: Carl Brickner
Contact Tel: (415) 972-3814
Contact Title: Site Assessment Manager (SAM)

Site Description: Not reported

CERCLIS Assessment History:
Action: DISCOVERY

JONELL OIL CORP (Continued) **1000204976**

Date Started: Not reported
Date Completed: 10/26/1990
Priority Level: Not reported

RCRA-SQG:
Date form received by agency: 02/25/1986
Facility name: JONELL OIL CORP
Facility address: 13649 LIVE OAK LANE
IRWINDALE, CA 91706
EPA ID: CAD981393077
Contact: ENVIRONMENTAL MANAGER
Contact address: 13649 LIVE OAK LANE
IRWINDALE, CA 91706
Contact country: US
Contact telephone: (818) 999-9999
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: J & H TARAZI
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: Unknown
Mixed waste (haz. and radioactive): Unknown
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: Unknown
Furnace exemption: Unknown
Used oil fuel burner: No

JONELL OIL CORP (Continued) **1000204976**

Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No
Off-site waste receiver: Commercial status unknown

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

Registry ID: 110002692042

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System) is the Superfund database that is used to support management in all phases of the Superfund program. The system contains information on all aspects of hazardous waste sites, including an inventory of sites, planned and actual site activities, and financial information.

HAZNET:
Gepaid: CAD981393077
Contact: JOHN TARAZI
Telephone: 6263034691
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 13649 LIVE OAK LN
Mailing City,St,Zip: IRWINDALE, CA 917061317
Gen County: Los Angeles
TSD EPA ID: Not reported
TSD County: Los Angeles
Waste Category: Other organic solids
Disposal Method: Disposal, Land Fill
Tons: 0.50
Facility County: Not reported

Gepaid: CAD981393077
Contact: JONELL OIL CORP
Telephone: 6263034691
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 13649 LIVE OAK LN
Mailing City,St,Zip: IRWINDALE, CA 917061317
Gen County: Los Angeles
TSD EPA ID: CAD099452708
TSD County: Los Angeles
Waste Category: Oil/water separation sludge

JONELL OIL CORP (Continued) **1000204976**

Disposal Method: Recycler
Tons: 1.6680
Facility County: Los Angeles

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133 **GRIFFITH COMPANY** **LUST** **S102430984**
NW **1380 ARROW HWY** **HIST CORTESE** **N/A**
1/2-1 **IRWINDALE, CA 91706**
0.700 mi.
3696 ft.

Relative:
Lower

Actual:
412 ft.

LUST:

Region:	STATE
Global Id:	T0603704025
Latitude:	34.1144959
Longitude:	-117.9737403
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	1991-08-28 00:00:00
Lead Agency:	LOS ANGELES COUNTY
Case Worker:	Not reported
Local Agency:	LOS ANGELES COUNTY
RB Case Number:	I-13024
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminats of Concern:	Gasoline
Site History:	Not reported

LUST REG 4:

Region:	4	
Regional Board:	04	
County:	Los Angeles	
facid:	I-13024	
Status:	Case Closed	
Substance:	Gasoline	
Substance Quantity:	Not reported	
Local Case No:	Not reported	
Case Type:	Soil	
Abatement Method Used at the Site:		Not reported
Global ID:	T0603704025	
W Global ID:	Not reported	
Staff:	UNK	
Local Agency:	19000	
Cross Street:	LIVE OAK	
Enforcement Type:	Not reported	
Date Leak Discovered:	1/9/1991	
Date Leak First Reported:		2/14/1991
Date Leak Record Entered:	4/5/1991	
Date Confirmation Began:	Not reported	
Date Leak Stopped:	1/9/1991	
Date Case Last Changed on Database:		4/18/1991
Date the Case was Closed:		8/28/1991
How Leak Discovered:	Tank Closure	
How Leak Stopped:	Not reported	
Cause of Leak:	UNK	
Leak Source:	UNK	
Operator:	DIAZ, VINCE	

GRIFFITH COMPANY (Continued) **S102430984**

Water System:	Not reported
Well Name:	Not reported
Approx. Dist To Production Well (ft):	4105.2546766631749022536493909
Source of Cleanup Funding:	UNK
Preliminary Site Assessment Workplan Submitted:	Not reported
Preliminary Site Assessment Began:	Not reported
Pollution Characterization Began:	Not reported
Remediation Plan Submitted:	Not reported
Remedial Action Underway:	Not reported
Post Remedial Action Monitoring Began:	Not reported
Enforcement Action Date:	Not reported
Historical Max MTBE Date:	Not reported
Hist Max MTBE Conc in Groundwater:	Not reported
Hist Max MTBE Conc in Soil:	Not reported
Significant Interim Remedial Action Taken:	Not reported
GW Qualifier:	Not reported
Soil Qualifier:	Not reported
Organization:	Not reported
Owner Contact:	Not reported
Responsible Party:	GRIFFITH CO.
RP Address:	12200 BLOOMFIELD AVE., SANTA FE SPRINGS, 90670
Program:	LUST
Lat/Long:	34.1144959 / -1
Local Agency Staff:	Not reported
Beneficial Use:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Suspended:	Not reported
Assigned Name:	Not reported
Summary:	Not reported

CORTESE:

Region:	CORTESE
Facility County Code:	19
Reg By:	LTNKA
Reg Id:	I-13024

134
ESE
1/2-1
0.736 mi.
3885 ft.

M. F. BOLSTER FLOORING CO.
5020 BLEECKER ST.
BALDWIN PARK, CA 91706

HAZNET **S106448213**
LUST **N/A**
SLIC
WIP
SWEEPS UST

Relative:
Higher

Actual:
431 ft.

HAZNET:

Gepaid:	CAC002573131
Contact:	ROB BOLSTER
Telephone:	6269600661
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	5020 BLEECKER ST
Mailing City,St,Zip:	BALDWIN PARK, CA 91706
Gen County:	Los Angeles
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Aqueous solution with less than 10% total organic residues
Disposal Method:	Treatment, Tank
Tons:	0.62

M. F. BOLSTER FLOORING CO. (Continued) **S106448213**

Facility County: Los Angeles

LUST REG 4:

Region:	4	
Regional Board:	04	
County:	Los Angeles	
facid:	R-14122	
Status:	Leak being confirmed	
Substance:	Gasoline	
Substance Quantity:	Not reported	
Local Case No:	13701-014122	
Case Type:	Soil	
Abatement Method Used at the Site:		Not reported
Global ID:	T0603760797	
W Global ID:	Not reported	
Staff:	UNK	
Local Agency:	19000	
Cross Street:	Not reported	
Enforcement Type:	Not reported	
Date Leak Discovered:	1/5/2004	
Date Leak First Reported:		2/4/2004
Date Leak Record Entered:	Not reported	
Date Confirmation Began:	2/4/2004	
Date Leak Stopped:	12/30/2003	
Date Case Last Changed on Database:		Not reported
Date the Case was Closed:		Not reported
How Leak Discovered:	OM	
How Leak Stopped:	Close Tank	
Cause of Leak:	UNK	
Leak Source:	UNK	
Operator:	Not reported	
Water System:	Not reported	
Well Name:	Not reported	
Approx. Dist To Production Well (ft):		Not reported
Source of Cleanup Funding:		UNK
Preliminary Site Assessment Workplan Submitted:		Not reported
Preliminary Site Assessment Began:		Not reported
Pollution Characterization Began:		Not reported
Remediation Plan Submitted:		Not reported
Remedial Action Underway:		Not reported
Post Remedial Action Monitoring Began:		Not reported
Enforcement Action Date:		Not reported
Historical Max MTBE Date:		Not reported
Hist Max MTBE Conc in Groundwater:		Not reported
Hist Max MTBE Conc in Soil:		0
Significant Interim Remedial Action Taken:		Not reported
GW Qualifier:	Not reported	
Soil Qualifier:	ND	
Organization:	Not reported	
Owner Contact:	Not reported	
Responsible Party:	ROBERT BOLSTER	
RP Address:	5020 BLEECKER ST.	
Program:	Not reported	
Lat/Long:	0 / 0	
Local Agency Staff:	Not reported	
Beneficial Use:	Not reported	
Priority:	Not reported	

M. F. BOLSTER FLOORING CO. (Continued) **S106448213**

Cleanup Fund Id: Not reported
Suspended: Not reported
Assigned Name: Not reported
Summary: Not reported

SLIC:
Region: STATE
Facility Status: Completed - Case Closed
Status Date: 2004-05-25 00:00:00
Global Id: T0603760797
Lead Agency: LOS ANGELES COUNTY
Lead Agency Case Number: 13701-014122
Latitude: 34.103854
Longitude: -117.955054
Case Type: Cleanup Program Site
Case Worker: Not reported
Local Agency: LOS ANGELES COUNTY
RB Case Number: R-14122
File Location: Not reported
Potential Media Affected: Soil
Potential Contaminants of Concern: Gasoline
Site History: Not reported

WIP:
Region: 4
File Number: 108.1160
File Status: Historical
Staff: TB
Facility Suite: Not reported

SWEEPS UST:
Status: A
Comp Number: 14122
Number: 9
Board Of Equalization: Not reported
Ref Date: 06-30-89
Act Date: Not reported
Created Date: 06-30-89
Tank Status: Not reported
Owner Tank Id: Not reported
Swrcb Tank Id: Not reported
Actv Date: Not reported
Capacity: Not reported
Tank Use: Not reported
Stg: Not reported
Content: Not reported
Number Of Tanks: Not reported

135
West
> 1
1.219 mi.
6434 ft.

WESTERN EMULSION CO.
284 LIVE OAK
IRWINDALE, CA 91706

Notify 65 **S100178032**
N/A

Relative:
Lower

Actual:
343 ft.

Notify 65:

Date Reported:	Not reported
Staff Initials:	Not reported
Board File Number:	Not reported
Facility Type:	Not reported
Discharge Date:	Not reported
Incident Description:	91706-1311

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BALDWIN HILLS	S107141219	CALTRANS DIST 7	CONNECTOR HWY 10/605 PM 19.9-3	91706	HAZNET
BALDWIN PARK	S107526521		(ALLEY) 5029 MAINE ST	91706	CDL
BALDWIN PARK	S108743957	CALTRANS DIST 7/CONSTR/EA07-232604	RTE 10 WB BETW BALDWIN PK BLVD	91706	HAZNET
BALDWIN PARK	S106825694	ALPINE MILLWORKS MFG	14930 E ARROW HWY UNIT B	91706	EMI
BALDWIN PARK	S108207166	FRANCISCO AUTO REPAIR	14439 JOANBRIDGE ST UNIT B	91706	HAZNET
BALDWIN PARK	S109277343	ARCO PRODUCTS #09671	4258 N MAINE AVE	91706	LOS ANGELES CO. HMS
IRIWNDALE	S107529353		16223 ARROW HWY BLDG C	91706	CDL
IRVINE	S108225273	WESTERN MECHANICAL INC	16025 E ARROW HWY STE A	91706	HAZNET
IRWINDALE	S102057568	UNITED ROCK PRODUCTS CORP	1245 E ARROW HWY	91706	LOS ANGELES CO. HMS, EMI, SWEE UST
IRWINDALE	S103441517	MGRDICIAN, JOHN	280 EAST ARROW HIGHWAY	91706	WMUDS/SWAT
IRWINDALE	S103633027	LOS ANGELES COUNTY FIRE DEPT	15546 E ARROW HWY- STATION 48	91706	HAZNET
IRWINDALE	S103963696	EXPRESS DISPOSAL/ALL WASTE	ARROW HWY / VISTA PLACE	91706	HAZNET
IRWINDALE	S106026652	EL POLLO BRAVO	16028 E ARROW HWY A3	91706	LOS ANGELES CO. HMS
IRWINDALE	S106093226	INFINITE PHOTO LAB	16300 ARROW HWY STE M	91706	HAZNET, WIP
IRWINDALE	S106766359	BOCK MACHINE INC.	16300 R ARROW HWY	91706	WIP
IRWINDALE	S106766360	VAN ASCH INC.	16300 R ARROW HWY	91706	WIP
IRWINDALE	S106800562	PIT NO. 2 MINE RECLAMATION	1245 E ARROW HWY	91706	CA WDS
IRWINDALE	S106825522	AL'S FINISHING, ALFREDO CORRAL	15556 ARROW HWY A	91706	EMI
IRWINDALE	S106841730	UNITED ROCK PRODUCTS CORP.	1245 E. ARROW HIGHWAY	91706	EMI
IRWINDALE	S106843034	TBD	1245 E ARROW HWY	91706	LA Co. Site Mitigation
IRWINDALE	S107148036	AM-MARK LABEL INC	16029 E ARROW HWY UNIT A	91706	HAZNET
IRWINDALE	S108147419	JUAN'S SUPER POLLO	16028 E ARROW HWY A3	91706	LOS ANGELES CO. HMS
IRWINDALE	S108198565	B P AIR INC	16027 ARROW HWY STE E	91706	HAZNET
IRWINDALE	S108212558	LOS ANGELES COUNTY FIRE DEPARTMENT	15546 E ARROW HWY-STATION 48	91706	HAZNET
IRWINDALE	S109431074	RTM MACHINING	16300 ARROW HWY UNIT E	91706	HAZNET
IRWINDALE	S109277861	THE PRINT SOURCE	16031 E ARROW HWY G,H / I		LOS ANGELES CO. HMS
IRWINDALE	S106671104	WATSON HOG RANCH (DEST)	13900 E ARROW HWY		LOS ANGELES CO. HMS
IRWINDALE	S106927368	HOME SAVINGS OF AMERICA	1001 COMMERCE DR		SWEEPS UST
IRWINDALE	S104156345	HAROLD SIMPSON GRADING CO DISP	200 EAST LIVE OAK AVE	91706	WMUDS/SWAT
IRWINDALE	S106840252	SUNBURST DECORATIVE ROCK INC	282 E LIVE OAK AVE.	91706	EMI
IRWINDALE	S106840253	SUNBURST DECORATIVE ROCK INC	282 E. LIVE OAK AVE.	91706	EMI
IRWINDALE	S106923016	B & B READY MIX	390 E LIVE OAK AVE	91706	SWEEPS UST
IRWINDALE	S108196721	ACE HARDWARE	404 E LIVE OAK AVE	91706	HAZNET
IRWINDALE	S103441649	VANTHERINE, THEO. L.-IRWINDALE	PECK RD / ARROW HWY	91706	WMUDS/SWAT
IRWINDALE	S109277420	CIRCLE K	5200 N RIVERGRADE RD A		LOS ANGELES CO. HMS
IRWINDALE	S109277772	RIVERGRADE SERV. STA. SHELL	5200 N RIVERGRADE RD B		LOS ANGELES CO. HMS
IRWINDALE	S105696505	WASHINGTON MUTUAL (SEE 033124)	4900 N RIVERGRADE RD	91706	LUST, LOS ANGELES CO. HMS
IRWINDALE	S101049307	IRWINDALE QUARRY LANDFILL	13550 E LIVE OAK AVE	91706	WMUDS/SWAT, EMI, CA WDS
IRWINDALE	S102004179	IRWINDALE SITE	13300 E LIVE OAK AVE	91706	WMUDS/SWAT
IRWINDALE	S102360726	NU-WAY LIVE OAK LANDFILL	13623 LIVE OAK AVE	91706	HAZNET, SWF/LF, WMUDS/SWAT, W CA WDS
IRWINDALE	S104156403	IRWINDALE	384 EAST LIVE OAK AVENUE	91706	WMUDS/SWAT

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 02/02/2009
Date Data Arrived at EDR: 02/12/2009
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 46

Source: EPA
Telephone: N/A
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/27/2009
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/23/2009
Date Data Arrived at EDR: 04/28/2009
Date Made Active in Reports: 05/19/2009
Number of Days to Update: 21

Source: EPA
Telephone: N/A
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/27/2009
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 02/02/2009
Date Data Arrived at EDR: 02/12/2009
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 46

Source: EPA
Telephone: N/A
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/27/2009
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 01/09/2009
Date Data Arrived at EDR: 01/30/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 101

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 05/29/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 12/03/2007
Date Data Arrived at EDR: 12/06/2007
Date Made Active in Reports: 02/20/2008
Number of Days to Update: 76

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 03/16/2009
Next Scheduled EDR Contact: 06/15/2009
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/25/2009
Date Data Arrived at EDR: 04/02/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 39

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/01/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Transporters, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 11/12/2008
Date Data Arrived at EDR: 11/18/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 118

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/23/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 11/12/2008
Date Data Arrived at EDR: 11/18/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 118

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/23/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 11/12/2008
Date Data Arrived at EDR: 11/18/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 118

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/23/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 11/12/2008
Date Data Arrived at EDR: 11/18/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 118

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/23/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/31/2009
Date Data Arrived at EDR: 04/22/2009
Date Made Active in Reports: 05/05/2009
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/31/2009
Date Data Arrived at EDR: 04/22/2009
Date Made Active in Reports: 05/05/2009
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 01/30/2009
Date Made Active in Reports: 05/19/2009
Number of Days to Update: 109

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 05/12/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 02/23/2009
Date Data Arrived at EDR: 02/24/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 43

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/27/2009
Next Scheduled EDR Contact: 08/24/2009
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 02/23/2009
Date Data Arrived at EDR: 02/24/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 43

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/27/2009
Next Scheduled EDR Contact: 08/24/2009
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 03/09/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Integrated Waste Management Board
Telephone: 916-341-6320
Last EDR Contact: 03/10/2009
Next Scheduled EDR Contact: 06/08/2009
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 04/13/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 05/04/2009
Next Scheduled EDR Contact: 08/03/2009
Data Release Frequency: Varies

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 06/01/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 05/18/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 04/08/2009
Date Data Arrived at EDR: 04/08/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 33

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 04/08/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 05/18/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 04/07/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Quarterly

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 05/11/2009
Next Scheduled EDR Contact: 08/10/2009
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Quarterly

SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/08/2009
Date Data Arrived at EDR: 04/08/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 33

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 04/08/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 05/18/2009
Next Scheduled EDR Contact: 08/17/2008
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 04/07/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 05/11/2009
Next Scheduled EDR Contact: 08/10/2009
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 06/01/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 05/26/2009
Next Scheduled EDR Contact: 08/24/2009
Data Release Frequency: Annually

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 12/15/2008
Date Data Arrived at EDR: 12/16/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 90

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 05/20/2009
Date Data Arrived at EDR: 05/20/2009
Date Made Active in Reports: 05/29/2009
Number of Days to Update: 9

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 03/03/2009
Date Data Arrived at EDR: 03/04/2009
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 26
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/01/2008
Date Data Arrived at EDR: 12/03/2008
Date Made Active in Reports: 12/23/2008
Number of Days to Update: 20
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 05/20/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 03/13/2009
Date Data Arrived at EDR: 03/17/2009
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 13
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/19/2009
Date Data Arrived at EDR: 02/19/2009
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 25
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 02/24/2009
Date Data Arrived at EDR: 03/03/2009
Date Made Active in Reports: 05/05/2009
Number of Days to Update: 63
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Semi-Annually

State and tribal registered storage tank lists

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 04/08/2009
Date Data Arrived at EDR: 04/08/2009
Date Made Active in Reports: 05/14/2009
Number of Days to Update: 36
Source: SWRCB
Telephone: 916-480-1028
Last EDR Contact: 04/08/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
Registered Aboveground Storage Tanks.

Date of Government Version: 11/01/2007
Date Data Arrived at EDR: 02/10/2009
Date Made Active in Reports: 04/14/2009
Number of Days to Update: 63
Source: State Water Resources Control Board
Telephone: 916-341-5712
Last EDR Contact: 05/29/2009
Next Scheduled EDR Contact: 07/27/2009
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/19/2009
Date Data Arrived at EDR: 02/19/2009
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 25

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 02/24/2009
Date Data Arrived at EDR: 03/03/2009
Date Made Active in Reports: 05/05/2009
Number of Days to Update: 63

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 09/08/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 10/16/2008
Number of Days to Update: 27

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/20/2009
Date Data Arrived at EDR: 05/20/2009
Date Made Active in Reports: 05/29/2009
Number of Days to Update: 9

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/01/2008
Date Data Arrived at EDR: 12/30/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 76

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 05/22/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 03/13/2009
Date Data Arrived at EDR: 03/17/2009
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 13

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 03/03/2009
Date Data Arrived at EDR: 03/04/2009
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 26

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 12/15/2008
Date Data Arrived at EDR: 12/16/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 90

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 04/02/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 02/23/2009
Date Data Arrived at EDR: 02/24/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 43

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/27/2009
Next Scheduled EDR Contact: 08/24/2009
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 10/01/2008
Date Data Arrived at EDR: 11/14/2008
Date Made Active in Reports: 12/23/2008
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 05/20/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 03/25/2008
Date Data Arrived at EDR: 04/17/2008
Date Made Active in Reports: 05/15/2008
Number of Days to Update: 28

Source: EPA, Region 9
Telephone: 415-972-3336
Last EDR Contact: 04/07/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 06/01/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Quarterly

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 04/07/2009
Date Data Arrived at EDR: 04/08/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 33

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 04/08/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 04/07/2009
Date Data Arrived at EDR: 04/07/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 34
Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 06/08/2009
Next Scheduled EDR Contact: 09/07/2009
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 05/26/2009
Next Scheduled EDR Contact: 08/24/2009
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 10/31/2008
Date Made Active in Reports: 12/23/2008
Number of Days to Update: 53
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/26/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: Quarterly

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 02/23/2009
Date Data Arrived at EDR: 02/24/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 43
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/27/2009
Next Scheduled EDR Contact: 08/24/2009
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites
Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 09/30/2008
Date Data Arrived at EDR: 10/06/2008
Date Made Active in Reports: 10/13/2008
Number of Days to Update: 7

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 05/22/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

Local Lists of Registered Storage Tanks

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 04/07/2009
Date Data Arrived at EDR: 04/07/2009
Date Made Active in Reports: 05/14/2009
Number of Days to Update: 37

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 04/07/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: Varies

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/06/2009
Date Data Arrived at EDR: 03/20/2009
Date Made Active in Reports: 05/05/2009
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 05/18/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 06/08/2009
Next Scheduled EDR Contact: 09/07/2009
Data Release Frequency: Varies

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 02/13/2009
Date Data Arrived at EDR: 02/17/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 50

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/04/2009
Next Scheduled EDR Contact: 08/03/2009
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 8

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/31/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/29/2009
Number of Days to Update: 43

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/16/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 05/09/2008
Date Made Active in Reports: 06/20/2008
Number of Days to Update: 42

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 05/18/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 04/08/2009
Date Data Arrived at EDR: 04/08/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 33

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 04/08/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 04/08/2009
Date Data Arrived at EDR: 04/08/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 33

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 04/08/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Quarterly

Other Ascertainable Records

RCRA-NonGen: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 11/12/2008
Date Data Arrived at EDR: 11/18/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 118

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/23/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 05/14/2008
Date Data Arrived at EDR: 05/28/2008
Date Made Active in Reports: 08/08/2008
Number of Days to Update: 72

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 05/27/2009
Next Scheduled EDR Contact: 08/24/2009
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 703-692-8801
Last EDR Contact: 05/08/2009
Next Scheduled EDR Contact: 08/03/2009
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 09/05/2008
Date Made Active in Reports: 09/23/2008
Number of Days to Update: 18

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 01/27/2009
Date Data Arrived at EDR: 04/23/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 18

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/21/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/23/2009
Date Data Arrived at EDR: 04/28/2009
Date Made Active in Reports: 05/19/2009
Number of Days to Update: 21

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 01/05/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 05/08/2009
Number of Days to Update: 1

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 03/16/2009
Next Scheduled EDR Contact: 06/15/2009
Data Release Frequency: Varies

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/19/2009
Date Data Arrived at EDR: 03/24/2009
Date Made Active in Reports: 05/05/2009
Number of Days to Update: 42

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/24/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 04/09/2009
Next Scheduled EDR Contact: 06/15/2009
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 04/14/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 03/16/2009
Next Scheduled EDR Contact: 06/15/2009
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 03/16/2009
Next Scheduled EDR Contact: 06/15/2009
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 03/14/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 05/18/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 03/20/2009
Date Data Arrived at EDR: 03/20/2009
Date Made Active in Reports: 05/05/2009
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 04/13/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 02/26/2009
Date Data Arrived at EDR: 05/20/2009
Date Made Active in Reports: 05/29/2009
Number of Days to Update: 9

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 05/04/2009
Next Scheduled EDR Contact: 08/03/2009
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/02/2009
Date Data Arrived at EDR: 04/24/2009
Date Made Active in Reports: 05/19/2009
Number of Days to Update: 25

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 04/28/2009
Date Data Arrived at EDR: 04/29/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/29/2009
Next Scheduled EDR Contact: 07/27/2009
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/28/2009
Date Data Arrived at EDR: 05/01/2009
Date Made Active in Reports: 05/19/2009
Number of Days to Update: 18

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 02/19/2009
Date Made Active in Reports: 05/22/2009
Number of Days to Update: 92

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 06/08/2009
Next Scheduled EDR Contact: 09/07/2009
Data Release Frequency: Biennially

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 03/09/2009
Date Data Arrived at EDR: 03/13/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 26

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 03/13/2009
Next Scheduled EDR Contact: 06/08/2009
Data Release Frequency: Quarterly

CA WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 03/16/2009
Next Scheduled EDR Contact: 06/15/2009
Data Release Frequency: Quarterly

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites). This listing is no longer updated by the state agency.

Date of Government Version: 04/20/2009
Date Data Arrived at EDR: 04/22/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 19

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 04/22/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES].

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NOTIFY 65: Proposition 65 Records

Proposition 65 Notification Records. NOTIFY 65 contains facility notifications about any release which could impact drinking water and thereby expose the public to a potential health risk.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 04/13/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: No Update Planned

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 05/06/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 4

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 04/17/2009
Next Scheduled EDR Contact: 03/30/2009
Data Release Frequency: Annually

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 03/31/2009
Date Data Arrived at EDR: 04/24/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 17

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 04/24/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 02/17/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 50

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 05/08/2009
Next Scheduled EDR Contact: 08/03/2009
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 10/16/2008
Date Made Active in Reports: 11/26/2008
Number of Days to Update: 41

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 04/17/2009
Next Scheduled EDR Contact: 04/13/2009
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 05/08/2009
Next Scheduled EDR Contact: 08/03/2009
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 12/08/2008
Date Data Arrived at EDR: 12/09/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 97

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 06/08/2009
Next Scheduled EDR Contact: 08/10/2009
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 05/08/2009
Next Scheduled EDR Contact: 08/03/2009
Data Release Frequency: N/A

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Historical Auto Stations: EDR Proprietary Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Historical Cleaners: EDR Proprietary Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 04/24/2009
Date Data Arrived at EDR: 04/28/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 13

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/24/2009
Date Data Arrived at EDR: 04/28/2009
Date Made Active in Reports: 05/14/2009
Number of Days to Update: 16

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Site List

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 02/24/2009
Date Data Arrived at EDR: 02/25/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 42

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 05/26/2009
Next Scheduled EDR Contact: 08/24/2009
Data Release Frequency: Semi-Annually

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 04/17/2009
Date Data Arrived at EDR: 04/17/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 24

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 05/04/2009
Next Scheduled EDR Contact: 08/03/2009
Data Release Frequency: Semi-Annually

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Kern County Sites and Tanks Listing.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 04/09/2009
Number of Days to Update: 9

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 06/01/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Quarterly

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 07/07/1999
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 04/13/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: No Update Planned

HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 11/26/2008
Date Data Arrived at EDR: 01/27/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 71

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 05/11/2009
Next Scheduled EDR Contact: 08/10/2009
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/21/2009
Date Data Arrived at EDR: 04/21/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 20

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 05/12/2009
Next Scheduled EDR Contact: 08/10/2009
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 06/08/2009
Next Scheduled EDR Contact: 09/07/2009
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 02/11/2009
Date Data Arrived at EDR: 04/23/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 18

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 05/11/2009
Next Scheduled EDR Contact: 08/10/2009
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 02/09/2009
Date Data Arrived at EDR: 02/17/2009
Date Made Active in Reports: 04/09/2009
Number of Days to Update: 51

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 05/11/2009
Next Scheduled EDR Contact: 08/10/2009
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/28/2003
Date Data Arrived at EDR: 10/23/2003
Date Made Active in Reports: 11/26/2003
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 06/03/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 02/23/2009
Date Data Arrived at EDR: 02/24/2009
Date Made Active in Reports: 04/09/2009
Number of Days to Update: 44

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 05/26/2009
Next Scheduled EDR Contact: 08/10/2009
Data Release Frequency: Semi-Annually

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 02/05/2009
Date Data Arrived at EDR: 02/17/2009
Date Made Active in Reports: 04/09/2009
Number of Days to Update: 51

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 04/27/2009
Next Scheduled EDR Contact: 07/27/2009
Data Release Frequency: Semi-Annually

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 07/09/2008
Date Data Arrived at EDR: 07/09/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 22

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: Semi-Annually

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: Annually

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 03/02/2009
Date Data Arrived at EDR: 03/18/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 21

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 06/03/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 03/02/2009
Date Data Arrived at EDR: 03/27/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 12

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 06/03/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 03/02/2009
Date Data Arrived at EDR: 03/18/2009
Date Made Active in Reports: 04/09/2009
Number of Days to Update: 22

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 04/27/2009
Date Data Arrived at EDR: 04/28/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 13

Source: Placer County Health and Human Services
Telephone: 530-889-7312
Last EDR Contact: 04/03/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites

Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 04/14/2009
Date Data Arrived at EDR: 04/15/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 26

Source: Department of Public Health
Telephone: 951-358-5055
Last EDR Contact: 04/13/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Quarterly

Underground Storage Tank Tank List

Underground storage tank sites located in Riverside county.

Date of Government Version: 05/06/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 05/14/2009
Number of Days to Update: 7

Source: Health Services Agency
Telephone: 951-358-5055
Last EDR Contact: 04/13/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Contaminated Sites

List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 02/04/2009
Date Data Arrived at EDR: 04/29/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 12

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/29/2009
Next Scheduled EDR Contact: 07/27/2009
Data Release Frequency: Quarterly

ML - Regulatory Compliance Master List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/04/2009
Date Data Arrived at EDR: 04/29/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 12

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/29/2009
Next Scheduled EDR Contact: 07/27/2009
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 04/08/2009
Date Data Arrived at EDR: 04/08/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 33

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 06/01/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 07/16/2008
Date Data Arrived at EDR: 10/29/2008
Date Made Active in Reports: 11/26/2008
Number of Days to Update: 28

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 04/03/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Quarterly

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 11/01/2008
Date Data Arrived at EDR: 12/23/2008
Date Made Active in Reports: 01/27/2009
Number of Days to Update: 35

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 05/18/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 01/22/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 8

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 03/31/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Varies

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 06/01/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 10/01/2008
Number of Days to Update: 12

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 06/01/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 02/10/2009
Date Data Arrived at EDR: 02/25/2009
Date Made Active in Reports: 04/09/2009
Number of Days to Update: 43

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 04/13/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Semi-Annually

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 04/29/2009
Date Data Arrived at EDR: 05/01/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 10
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 04/07/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 04/07/2009
Date Data Arrived at EDR: 04/07/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 34
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 04/07/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Semi-Annually

SANTA CLARA COUNTY:

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22
Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 12/29/2008
Date Data Arrived at EDR: 12/29/2008
Date Made Active in Reports: 01/27/2009
Number of Days to Update: 29
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 05/18/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: Varies

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 03/03/2009
Date Data Arrived at EDR: 03/03/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 36
Source: City of San Jose Fire Department
Telephone: 408-277-4659
Last EDR Contact: 06/01/2009
Next Scheduled EDR Contact: 08/31/2009
Data Release Frequency: Annually

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 03/23/2009
Date Data Arrived at EDR: 04/07/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 34
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 03/23/2009
Date Data Arrived at EDR: 04/10/2009
Date Made Active in Reports: 05/14/2009
Number of Days to Update: 34

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: Quarterly

SONOMA COUNTY:

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 04/20/2009
Date Data Arrived at EDR: 04/21/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 20

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 04/01/2009
Date Data Arrived at EDR: 04/02/2009
Date Made Active in Reports: 04/09/2009
Number of Days to Update: 7

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 03/30/2009
Next Scheduled EDR Contact: 06/29/2009
Data Release Frequency: Semi-Annually

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 02/26/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 8

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/10/2009
Next Scheduled EDR Contact: 06/08/2009
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 08/01/2008
Date Data Arrived at EDR: 09/04/2008
Date Made Active in Reports: 09/18/2008
Number of Days to Update: 14

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/17/2009
Next Scheduled EDR Contact: 08/17/2009
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/09/2009
Next Scheduled EDR Contact: 09/07/2009
Data Release Frequency: Quarterly

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 03/31/2009
Date Data Arrived at EDR: 04/08/2009
Date Made Active in Reports: 05/14/2009
Number of Days to Update: 36

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 04/08/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 04/21/2009
Date Data Arrived at EDR: 05/06/2009
Date Made Active in Reports: 05/14/2009
Number of Days to Update: 8

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 04/13/2009
Next Scheduled EDR Contact: 07/13/2009
Data Release Frequency: Annually

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 12/11/2008
Date Made Active in Reports: 03/19/2009
Number of Days to Update: 98

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 03/13/2009
Next Scheduled EDR Contact: 06/08/2009
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 05/05/2009
Date Made Active in Reports: 05/22/2009
Number of Days to Update: 17

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 05/05/2009
Next Scheduled EDR Contact: 08/03/2009
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/27/2009
Date Data Arrived at EDR: 02/25/2009
Date Made Active in Reports: 03/12/2009
Number of Days to Update: 15

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/27/2009
Next Scheduled EDR Contact: 08/24/2009
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 09/11/2008
Date Made Active in Reports: 10/02/2008
Number of Days to Update: 21

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/08/2009
Next Scheduled EDR Contact: 09/07/2009
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 02/12/2009
Date Made Active in Reports: 03/11/2009
Number of Days to Update: 27

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 03/16/2009
Next Scheduled EDR Contact: 06/15/2009
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 08/22/2008
Date Made Active in Reports: 09/08/2008
Number of Days to Update: 17

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 04/07/2009
Next Scheduled EDR Contact: 07/06/2009
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

17.5-ACRE VACANT LOT
LIVE OAK AVENUE
IRWINDALE, CA 91706

TARGET PROPERTY COORDINATES

Latitude (North):	34.10820 - 34° 6' 29.5''
Longitude (West):	117.9667 - 117° 58' 0.1''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	410837.1
UTM Y (Meters):	3774380.0
Elevation:	418 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	34117-A8 BALDWIN PARK, CA
Most Recent Revision:	1981
North Map:	34117-B8 AZUSA, CA
Most Recent Revision:	1972

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

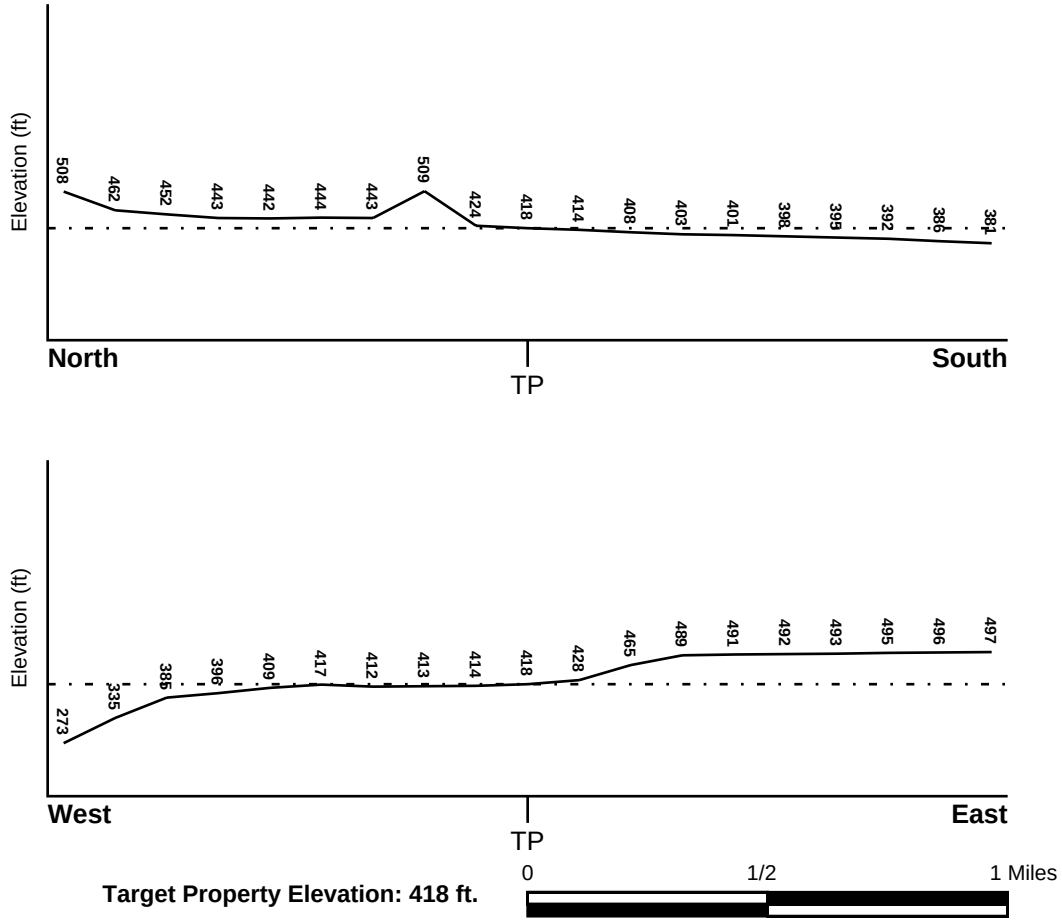
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 418 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
LOS ANGELES, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 0601000000A

Additional Panels in search area: 0601290000A

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	Not Available

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name: URBAN LAND

Soil Surface Texture: variable

Hydrologic Group: Not reported

Soil Drainage Class: Not reported

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 10 inches

Depth to Bedrock Max: > 10 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	6 inches	variable	Not reported	Not reported	Max: 0.00 Min: 0.00	Max: 0.00 Min: 0.00

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures:
sandy loam
gravelly - sandy loam
silt loam
clay
fine sand
gravelly - sand
sand
fine sandy loam

Surficial Soil Types:
sandy loam
gravelly - sandy loam
silt loam
clay
fine sand
gravelly - sand
sand
fine sandy loam

Shallow Soil Types:
fine sandy loam
gravelly - loam
sandy clay
sandy clay loam
clay
silty clay
sand

Deeper Soil Types:
gravelly - sandy loam
sandy loam
very gravelly - sandy loam
stratified
very fine sandy loam
weathered bedrock
sand
gravelly - fine sandy loam
silty clay loam
clay loam

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A2	USGS3134921	1/4 - 1/2 Mile SE
A3	USGS3134929	1/4 - 1/2 Mile ESE
C8	USGS3135064	1/2 - 1 Mile SW
C9	USGS3135062	1/2 - 1 Mile SW
C10	USGS3135063	1/2 - 1 Mile SW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

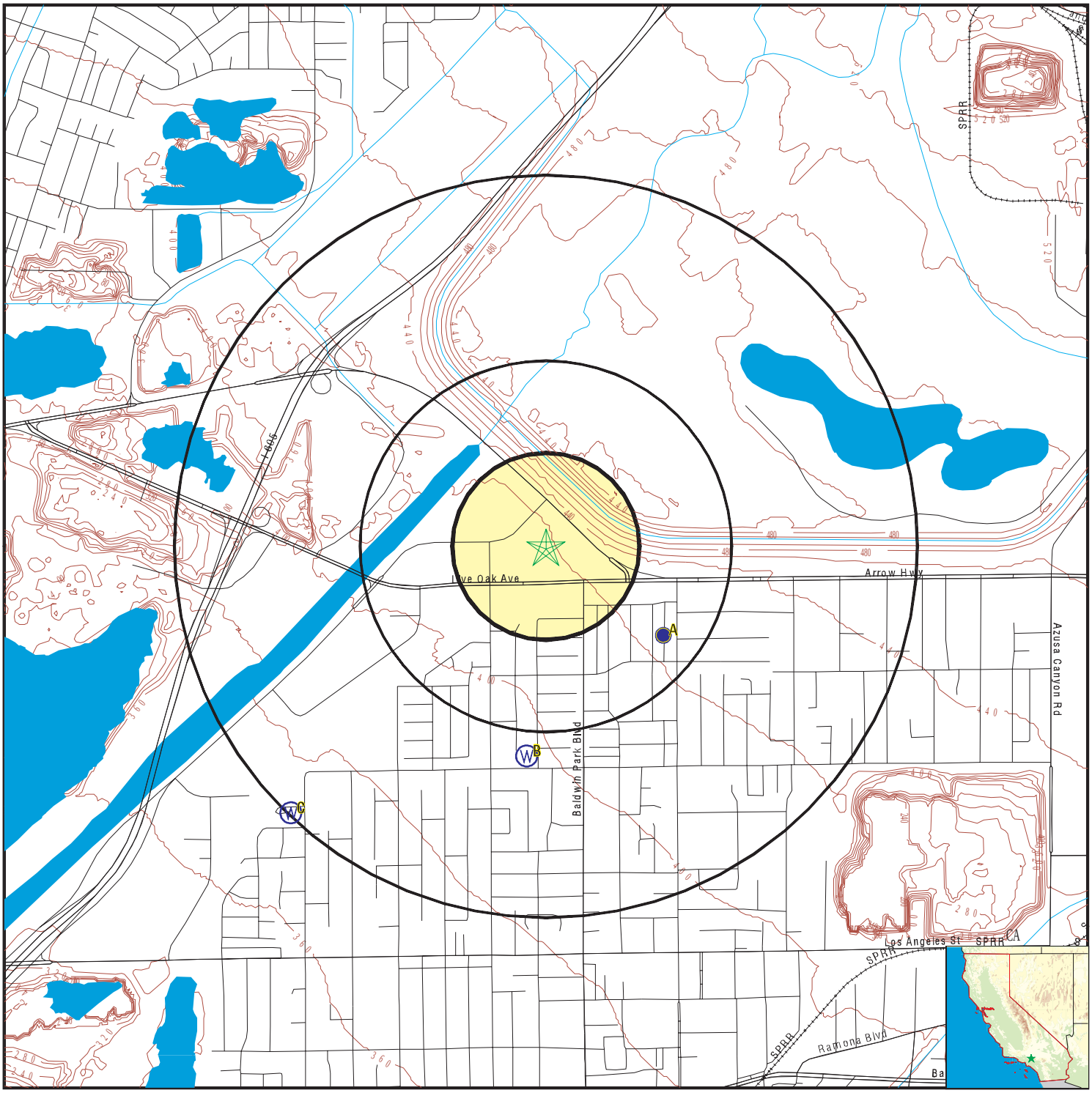
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A1	CADW20000006776	1/4 - 1/2 Mile SE
B4	1250	1/2 - 1 Mile South
B5	1247	1/2 - 1 Mile South
B6	1248	1/2 - 1 Mile South
B7	1249	1/2 - 1 Mile South

PHYSICAL SETTING SOURCE MAP - 2516447.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	17.5-Acre Vacant Lot	CLIENT:	Converse Consultants
ADDRESS:	Live Oak Avenue Irwindale CA 91706	CONTACT:	Heidi Yavornicky
LAT/LONG:	34.1082 / 117.9667	INQUIRY #:	2516447.2s
		DATE:	June 11, 2009 9:23 am

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

A1
SE
1/4 - 1/2 Mile
Higher | **CA WELLS** | **CADW20000006776**

Longitude:	117.9603
Latitude:	34.105
Stwellno:	01S10W07A006S
Districtco:	3
Welluseco:	P
Countycode:	19
Gwcode:	401300
Site id:	CADW20000006776

A2
SE
1/4 - 1/2 Mile
Higher | **FED USGS** | **USGS3134921**

Agency cd:	USGS	Site no:	340615117574001
Site name:	001S011W06J001S		
Latitude:	340615		
Longitude:	1175740	Dec lat:	34.10417495
Dec lon:	-117.96200895	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	037
Country:	US	Land net:	Not Reported
Location map:	BALDWIN PARK	Map scale:	24000
Altitude:	Not Reported		
Altitude method:	Not Reported		
Altitude accuracy:	Not Reported		
Altitude datum:	Not Reported		
Hydrologic:	Los Angeles. California. Area = 819 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	9479335800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

A3
ESE
1/4 - 1/2 Mile
Higher

FED USGS **USGS3134929**

Agency cd:	USGS	Site no:	340618117573401
Site name:	001S010W07A006S		
Latitude:	340618		
Longitude:	1175734	Dec lat:	34.10500827
Dec lon:	-117.96034223	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	037
Country:	US	Land net:	Not Reported
Location map:	BALDWIN PARK	Map scale:	24000
Altitude:	422.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	10		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Gabriel. California. Area = 713 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	19610924
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	580	Hole depth:	600
Source of depth data:	Not Reported		
Project number:	9479335800		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1975-08-11
Water quality data end date:	1977-08-23	Water quality data count:	3
Ground water data begin date:	1961-09-24	Ground water data end date:	1961-09-24
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1961-09-24	215.00	

B4
South
1/2 - 1 Mile
Lower

CA WELLS **1250**

Water System Information:

Prime Station Code:	01S/10W-07A07 S	User ID:	4TH
FRDS Number:	1910009002	County:	Los Angeles
District Number:	07	Station Type:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Water Type:	Well/Groundwater	Well Status:	Active Treated
Source Lat/Long:	340600.0 1175800.0	Precision:	Undefined
Source Name:	WELL 02 MAIN ST. WEST - TREATED		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

System Number: 1910009
System Name: VALLEY COUNTY WATER DIST.
Organization That Operates System:
14521 E RAMONA BLD
BALDWIN PARK, CA 91706
Pop Served: 45000 Connections: 11664
Area Served: BALDWIN PARK

Sample Collected:	12/17/2007 00:00:00	Findings:	7.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/17/2007 00:00:00	Findings:	2.2 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	12/17/2007 00:00:00	Findings:	.63 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/28/2007 00:00:00	Findings:	.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/28/2007 00:00:00	Findings:	7.25 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/28/2007 00:00:00	Findings:	1.9 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/19/2007 00:00:00	Findings:	2.1 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/19/2007 00:00:00	Findings:	.61 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/19/2007 00:00:00	Findings:	7.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/23/2007 00:00:00	Findings:	1.9 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	10/23/2007 00:00:00	Findings:	.53 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	10/23/2007 00:00:00	Findings:	7.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/26/2007 00:00:00	Findings:	.54 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	09/26/2007 00:00:00	Findings:	6.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/26/2007 00:00:00	Findings:	1.9 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/22/2007 00:00:00	Findings:	1.4 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/22/2007 00:00:00	Findings:	6.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/13/2007 00:00:00	Findings:	7.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/13/2007 00:00:00	Findings:	1.6 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	07/17/2007 00:00:00	Findings:	1.2 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	07/17/2007 00:00:00	Findings:	7.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/12/2007 00:00:00	Findings:	1.1 UG/L
Chemical:	TETRACHLOROETHYLENE		

Sample Collected:	06/12/2007 00:00:00	Findings:	7.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/30/2007 00:00:00	Findings:	6.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/30/2007 00:00:00	Findings:	1.1 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	05/15/2007 00:00:00	Findings:	1.1 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/17/2007 00:00:00	Findings:	1 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	03/19/2007 00:00:00	Findings:	.82 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	02/20/2007 00:00:00	Findings:	5.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/20/2007 00:00:00	Findings:	.63 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	01/23/2007 00:00:00	Findings:	.7 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/27/2006 00:00:00	Findings:	4.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/16/2006 00:00:00	Findings:	5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/04/2006 00:00:00	Findings:	5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/04/2006 00:00:00	Findings:	5.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/19/2006 00:00:00	Findings:	5.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/07/2006 00:00:00	Findings:	4.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/08/2006 00:00:00	Findings:	4.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/26/2006 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/23/2006 00:00:00	Findings:	41 MG/L
Chemical:	CALCIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	8.4 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	9.4 MG/L
Chemical:	SODIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	2.9 MG/L
Chemical:	POTASSIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	8 MG/L
Chemical:	CHLORIDE		
Sample Collected:	01/23/2006 00:00:00	Findings:	.3 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	01/23/2006 00:00:00	Findings:	200 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	01/23/2006 00:00:00	Findings:	- .169
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		

Sample Collected:	01/23/2006 00:00:00	Findings:	4.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/23/2006 00:00:00	Findings:	140 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	01/23/2006 00:00:00	Findings:	160 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	01/23/2006 00:00:00	Findings:	130 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	01/23/2006 00:00:00	Findings:	7.56
Chemical:	PH, LABORATORY		
Sample Collected:	01/23/2006 00:00:00	Findings:	320 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	01/23/2006 00:00:00	Findings:	16 C
Chemical:	SOURCE TEMPERATURE C		
Sample Collected:	01/04/2006 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/13/2005 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/30/2005 00:00:00	Findings:	.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	11/30/2005 00:00:00	Findings:	2.2 PCI/L
Chemical:	RADIUM 226		
Sample Collected:	11/30/2005 00:00:00	Findings:	.7 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	11/30/2005 00:00:00	Findings:	2.2 PCI/L
Chemical:	COMBINED RA 226 + RA 228		
Sample Collected:	11/30/2005 00:00:00	Findings:	.7 PCI/L
Chemical:	COMBINED RA 226 + RA 228 COUNTING ERROR		
Sample Collected:	11/30/2005 00:00:00	Findings:	4.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/02/2005 00:00:00	Findings:	4.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/05/2005 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/07/2005 00:00:00	Findings:	3.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2005 00:00:00	Findings:	.26 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08/25/2005 00:00:00	Findings:	3.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2005 00:00:00	Findings:	.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	08/25/2005 00:00:00	Findings:	2.2 PCI/L
Chemical:	RADIUM 226		
Sample Collected:	08/25/2005 00:00:00	Findings:	.7 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	08/25/2005 00:00:00	Findings:	2.2 PCI/L
Chemical:	COMBINED RA 226 + RA 228		
Sample Collected:	08/25/2005 00:00:00	Findings:	.7 PCI/L
Chemical:	COMBINED RA 226 + RA 228 COUNTING ERROR		

Sample Collected:	08/02/2005 00:00:00	Findings:	4.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/08/2005 00:00:00	Findings:	4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/26/2005 00:00:00	Findings:	4.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/26/2005 00:00:00	Findings:	.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	05/26/2005 00:00:00	Findings:	2.2 PCI/L
Chemical:	RADIUM 226		
Sample Collected:	05/26/2005 00:00:00	Findings:	.7 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	05/26/2005 00:00:00	Findings:	2.2 PCI/L
Chemical:	COMBINED RA 226 + RA 228		
Sample Collected:	05/26/2005 00:00:00	Findings:	.7 PCI/L
Chemical:	COMBINED RA 226 + RA 228 COUNTING ERROR		
Sample Collected:	05/25/2005 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/24/2005 00:00:00	Findings:	2.2 PCI/L
Chemical:	RADIUM 226		
Sample Collected:	03/24/2005 00:00:00	Findings:	.7 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	03/24/2005 00:00:00	Findings:	2.2 PCI/L
Chemical:	COMBINED RA 226 + RA 228		
Sample Collected:	03/24/2005 00:00:00	Findings:	.7 PCI/L
Chemical:	COMBINED RA 226 + RA 228 COUNTING ERROR		
Sample Collected:	03/24/2005 00:00:00	Findings:	6.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/24/2005 00:00:00	Findings:	.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	10/26/2004 00:00:00	Findings:	42 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	17 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/26/2004 00:00:00	Findings:	14 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	6.3 UG/L
Chemical:	PERCHLORATE		
Sample Collected:	10/26/2004 00:00:00	Findings:	1.2 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	10/26/2004 00:00:00	Findings:	94 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	4.4 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	2.3 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	10/26/2004 00:00:00	Findings:	1.2 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	10/26/2004 00:00:00	Findings:	.75 UG/L
Chemical:	TRANS-1,2-DICHLOROETHYLENE		

Sample Collected:	09/22/2004 00:00:00	Findings:	36 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	16 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/22/2004 00:00:00	Findings:	12 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	4.6 UG/L
Chemical:	PERCHLORATE		
Sample Collected:	09/22/2004 00:00:00	Findings:	84 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	10 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	1.9 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	09/22/2004 00:00:00	Findings:	.95 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	08/25/2004 00:00:00	Findings:	56 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	6.1 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	8.3 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	.8 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	08/25/2004 00:00:00	Findings:	21 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	15 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2004 00:00:00	Findings:	1.3 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	08/19/2004 00:00:00	Findings:	8.7 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	66 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	6 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	1.4 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	08/19/2004 00:00:00	Findings:	.81 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	08/19/2004 00:00:00	Findings:	24 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	15 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/14/2004 00:00:00	Findings:	48 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	07/14/2004 00:00:00	Findings:	3.3 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	07/14/2004 00:00:00	Findings:	1.1 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		

Sample Collected:	07/14/2004 00:00:00	Findings:	.58 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	07/14/2004 00:00:00	Findings:	18 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	07/14/2004 00:00:00	Findings:	7.5 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	29 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	2 UG/L
Chemical:	1,1-DICHLOROETHANE		
Sample Collected:	06/02/2004 00:00:00	Findings:	.6 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	06/02/2004 00:00:00	Findings:	7.7 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	15.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/02/2004 00:00:00	Findings:	3.2 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	05/13/2004 00:00:00	Findings:	3.1 UG/L
Chemical:	DICHLOROMETHANE		
Sample Collected:	05/13/2004 00:00:00	Findings:	14 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	05/13/2004 00:00:00	Findings:	1.2 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	05/13/2004 00:00:00	Findings:	5.4 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	05/13/2004 00:00:00	Findings:	16.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/13/2004 00:00:00	Findings:	2.2 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	05/05/2004 00:00:00	Findings:	14 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	05/05/2004 00:00:00	Findings:	1 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	05/05/2004 00:00:00	Findings:	3.8 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	05/05/2004 00:00:00	Findings:	15.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/05/2004 00:00:00	Findings:	1.5 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	04/06/2004 00:00:00	Findings:	11 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/06/2004 00:00:00	Findings:	10 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/06/2004 00:00:00	Findings:	3.4 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	04/06/2004 00:00:00	Findings:	1.5 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	06/02/2003 00:00:00	Findings:	68 UG/L
Chemical:	TETRACHLOROETHYLENE		

Sample Collected:	06/02/2003 00:00:00	Findings:	4.8 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	06/02/2003 00:00:00	Findings:	1.5 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	06/02/2003 00:00:00	Findings:	19 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	06/02/2003 00:00:00	Findings:	11 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/02/2003 00:00:00	Findings:	8 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	06/02/2003 00:00:00	Findings:	.73 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	04/01/2003 00:00:00	Findings:	1.3 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	04/01/2003 00:00:00	Findings:	56 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/01/2003 00:00:00	Findings:	6.6 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	04/01/2003 00:00:00	Findings:	1.7 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	04/01/2003 00:00:00	Findings:	.83 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	04/01/2003 00:00:00	Findings:	25 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	04/01/2003 00:00:00	Findings:	8.8 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	12/03/2002 00:00:00	Findings:	53 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	12/03/2002 00:00:00	Findings:	4 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	12/03/2002 00:00:00	Findings:	1.8 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	12/03/2002 00:00:00	Findings:	.81 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	12/03/2002 00:00:00	Findings:	23 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	12/03/2002 00:00:00	Findings:	1.4 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	12/03/2002 00:00:00	Findings:	1.4 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	11/04/2002 00:00:00	Findings:	1.3 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	11/04/2002 00:00:00	Findings:	45 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	4.6 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	1.3 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	11/04/2002 00:00:00	Findings:	.65 UG/L
Chemical:	1,2-DICHLOROETHANE		

Sample Collected:	11/04/2002 00:00:00	Findings:	16 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	6.1 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	1.3 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	11/04/2002 00:00:00	Findings:	42 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	5 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	1.3 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	11/04/2002 00:00:00	Findings:	16 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	13 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/04/2002 00:00:00	Findings:	6.1 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	10/02/2002 00:00:00	Findings:	16 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	10/02/2002 00:00:00	Findings:	5.2 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	10/02/2002 00:00:00	Findings:	1.1 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	10/02/2002 00:00:00	Findings:	1.1 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	10/02/2002 00:00:00	Findings:	49 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	10/02/2002 00:00:00	Findings:	3.2 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	10/02/2002 00:00:00	Findings:	1.2 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	10/02/2002 00:00:00	Findings:	.57 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	09/03/2002 00:00:00	Findings:	13 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	09/03/2002 00:00:00	Findings:	4.3 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	09/03/2002 00:00:00	Findings:	.92 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	09/03/2002 00:00:00	Findings:	42 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/03/2002 00:00:00	Findings:	.6 UG/L
Chemical:	1,1-DICHLOROETHANE		
Sample Collected:	09/03/2002 00:00:00	Findings:	2.2 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	09/03/2002 00:00:00	Findings:	1 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	09/03/2002 00:00:00	Findings:	.55 UG/L
Chemical:	1,2-DICHLOROETHANE		

Sample Collected:	08/08/2002 00:00:00	Findings:	29 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	3 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	.81 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	08/08/2002 00:00:00	Findings:	11 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	13 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/08/2002 00:00:00	Findings:	4 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	.83 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	08/08/2002 00:00:00	Findings:	.3 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08/08/2002 00:00:00	Findings:	150 UG/L
Chemical:	BARIUM		
Sample Collected:	08/07/2002 00:00:00	Findings:	11 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/07/2002 00:00:00	Findings:	29 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	07/09/2002 00:00:00	Findings:	22 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	07/09/2002 00:00:00	Findings:	2.3 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	07/09/2002 00:00:00	Findings:	.76 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	07/09/2002 00:00:00	Findings:	8.7 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	07/09/2002 00:00:00	Findings:	3 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	07/09/2002 00:00:00	Findings:	.77 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	06/04/2002 00:00:00	Findings:	17 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	06/04/2002 00:00:00	Findings:	1.7 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	06/04/2002 00:00:00	Findings:	.56 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	06/04/2002 00:00:00	Findings:	7.3 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	06/04/2002 00:00:00	Findings:	2.3 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	06/04/2002 00:00:00	Findings:	.58 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	05/14/2002 00:00:00	Findings:	14 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	05/14/2002 00:00:00	Findings:	1.2 UG/L
Chemical:	1,1-DICHLOROETHYLENE		

Sample Collected:	05/14/2002 00:00:00	Findings:	4.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	05/14/2002 00:00:00	Findings:	1.7 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	05/10/2002 00:00:00	Findings:	5.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	05/10/2002 00:00:00	Findings:	17 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/02/2002 00:00:00	Findings:	6.8 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/02/2002 00:00:00	Findings:	.61 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	04/02/2002 00:00:00	Findings:	3 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	04/02/2002 00:00:00	Findings:	12 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/02/2002 00:00:00	Findings:	.88 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	03/25/2002 00:00:00	Findings:	5.9 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	03/25/2002 00:00:00	Findings:	2.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	03/19/2002 00:00:00	Findings:	12 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/12/2002 00:00:00	Findings:	2.1 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	03/12/2002 00:00:00	Findings:	5.2 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	02/26/2002 00:00:00	Findings:	1.1 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	02/26/2002 00:00:00	Findings:	2.5 UG/L
Chemical:	TETRACHLOROETHYLENE		

B5
South **CA WELLS** **1247**
1/2 - 1 Mile
Lower

Water System Information:

Prime Station Code:	01S/10W-07A01 S	User ID:	4TH
FRDS Number:	1910009006	County:	Los Angeles
District Number:	07	Station Type:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	340600.0 1175800.0	Precision:	Undefined
Source Name:	WELL 06W JOAN BRIDGE WEST		
System Number:	1910009		
System Name:	VALLEY COUNTY WATER DIST.		
Organization That Operates System:			
	14521 E RAMONA BLD		
	BALDWIN PARK, CA 91706		
Pop Served:	45000	Connections:	11664
Area Served:	BALDWIN PARK		

Sample Collected:	12/11/2007 00:00:00	Findings:	4.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/19/2007 00:00:00	Findings:	3.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/23/2007 00:00:00	Findings:	.028 UG/L
Chemical:	N-NITROSODIMETHYLAMINE (NDMA)		
Sample Collected:	10/23/2007 00:00:00	Findings:	4.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/26/2007 00:00:00	Findings:	4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/22/2007 00:00:00	Findings:	4.27 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/22/2007 00:00:00	Findings:	4.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/22/2007 00:00:00	Findings:	.26 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08/22/2007 00:00:00	Findings:	105 UG/L
Chemical:	BARIUM		
Sample Collected:	07/17/2007 00:00:00	Findings:	4.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/19/2007 00:00:00	Findings:	3.7 UG/L
Chemical:	N-NITROSODIMETHYLAMINE (NDMA)		
Sample Collected:	06/19/2007 00:00:00	Findings:	4.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/30/2007 00:00:00	Findings:	2.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/20/2007 00:00:00	Findings:	4.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/27/2006 00:00:00	Findings:	3.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/16/2006 00:00:00	Findings:	3.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/04/2006 00:00:00	Findings:	4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/04/2006 00:00:00	Findings:	4.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/19/2006 00:00:00	Findings:	4.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/07/2006 00:00:00	Findings:	3.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/08/2006 00:00:00	Findings:	3.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/26/2006 00:00:00	Findings:	3.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/23/2006 00:00:00	Findings:	3.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/23/2006 00:00:00	Findings:	17 C
Chemical:	SOURCE TEMPERATURE C		
Sample Collected:	01/23/2006 00:00:00	Findings:	380 US
Chemical:	SPECIFIC CONDUCTANCE		

Sample Collected:	01/23/2006 00:00:00	Findings:	7.51
Chemical:	PH, LABORATORY		
Sample Collected:	01/23/2006 00:00:00	Findings:	130 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	01/23/2006 00:00:00	Findings:	160 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	01/23/2006 00:00:00	Findings:	140 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	01/23/2006 00:00:00	Findings:	42 MG/L
Chemical:	CALCIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	8.5 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	10 MG/L
Chemical:	SODIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	9 MG/L
Chemical:	CHLORIDE		
Sample Collected:	01/23/2006 00:00:00	Findings:	.26 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	01/23/2006 00:00:00	Findings:	210 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	01/23/2006 00:00:00	Findings:	- .197
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	01/04/2006 00:00:00	Findings:	3.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/13/2005 00:00:00	Findings:	3.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/30/2005 00:00:00	Findings:	3.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/02/2005 00:00:00	Findings:	4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/05/2005 00:00:00	Findings:	4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/07/2005 00:00:00	Findings:	3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2005 00:00:00	Findings:	4.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/02/2005 00:00:00	Findings:	3.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/08/2005 00:00:00	Findings:	3.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/25/2005 00:00:00	Findings:	3.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/18/2005 00:00:00	Findings:	3.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/26/2005 00:00:00	Findings:	3.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/16/2005 00:00:00	Findings:	8.5 MG/L
Chemical:	NITRATE (AS NO3)		

Sample Collected:	02/01/2005 00:00:00	Findings:	7.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/25/2005 00:00:00	Findings:	3.6 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	01/25/2005 00:00:00	Findings:	1.3 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	01/25/2005 00:00:00	Findings:	7.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/28/2004 00:00:00	Findings:	4.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	12/28/2004 00:00:00	Findings:	1.4 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	12/28/2004 00:00:00	Findings:	7.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/28/2004 00:00:00	Findings:	16 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	12/28/2004 00:00:00	Findings:	1.2 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	11/24/2004 00:00:00	Findings:	4 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/24/2004 00:00:00	Findings:	1.9 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	11/24/2004 00:00:00	Findings:	8 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/24/2004 00:00:00	Findings:	2 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	11/22/2004 00:00:00	Findings:	11 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/22/2004 00:00:00	Findings:	1.1 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	11/22/2004 00:00:00	Findings:	3.4 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/22/2004 00:00:00	Findings:	1.3 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	2.6 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	1 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	5.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/22/2004 00:00:00	Findings:	2.3 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	1.1 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	5.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2004 00:00:00	Findings:	2 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	08/25/2004 00:00:00	Findings:	1.9 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		

Sample Collected:	08/25/2004 00:00:00	Findings:	.25 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08/25/2004 00:00:00	Findings:	1 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	4.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/19/2004 00:00:00	Findings:	1.8 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	.83 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	5.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/14/2004 00:00:00	Findings:	1.7 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	07/14/2004 00:00:00	Findings:	.66 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	4.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/13/2004 00:00:00	Findings:	2 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	05/13/2004 00:00:00	Findings:	1.9 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	05/13/2004 00:00:00	Findings:	1.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	05/04/2004 00:00:00	Findings:	5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/06/2004 00:00:00	Findings:	5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/16/2004 00:00:00	Findings:	2 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	03/16/2004 00:00:00	Findings:	1.9 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	03/16/2004 00:00:00	Findings:	1.8 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	03/03/2004 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/05/2004 00:00:00	Findings:	4.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/04/2004 00:00:00	Findings:	3.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/27/2004 00:00:00	Findings:	5.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/29/2003 00:00:00	Findings:	4 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	09/29/2003 00:00:00	Findings:	3.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/29/2003 00:00:00	Findings:	2.1 UG/L
Chemical:	TRICHLOROETHYLENE		

Sample Collected:	05/29/2003 00:00:00	Findings:	4 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/26/2002 00:00:00	Findings:	2.4 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/26/2002 00:00:00	Findings:	1.1 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	4 MG/L
Chemical:	NITRATE (AS NO3)		

B6
South **CA WELLS** **1248**
1/2 - 1 Mile
Lower

Water System Information:

Prime Station Code:	01S/10W-07A02 S	User ID:	4TH
FRDS Number:	1910009005	County:	Los Angeles
District Number:	07	Station Type:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Water Type:	Well/Groundwater	Well Status:	Active Treated
Source Lat/Long:	340600.0 1175800.0	Precision:	Undefined
Source Name:	WELL 06E JOAN BRIDGE EAST - TREATED		
System Number:	1910009		
System Name:	VALLEY COUNTY WATER DIST.		
Organization That Operates System:			
	14521 E RAMONA BLD		
	BALDWIN PARK, CA 91706		
Pop Served:	45000	Connections:	11664
Area Served:	BALDWIN PARK		
Sample Collected:	12/11/2007 00:00:00	Findings:	.96 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	12/11/2007 00:00:00	Findings:	5.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/28/2007 00:00:00	Findings:	.7 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/19/2007 00:00:00	Findings:	4.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/19/2007 00:00:00	Findings:	.85 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	10/23/2007 00:00:00	Findings:	5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/23/2007 00:00:00	Findings:	.78 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/28/2007 00:00:00	Findings:	.62 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/26/2007 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/26/2007 00:00:00	Findings:	.64 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/13/2007 00:00:00	Findings:	4.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/17/2007 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		

Sample Collected:	06/12/2007 00:00:00	Findings:	5.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/30/2007 00:00:00	Findings:	.5 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	05/30/2007 00:00:00	Findings:	.2 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	05/30/2007 00:00:00	Findings:	.9 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	05/30/2007 00:00:00	Findings:	4.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/20/2007 00:00:00	Findings:	.5 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	02/20/2007 00:00:00	Findings:	.2 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	02/20/2007 00:00:00	Findings:	.9 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	02/20/2007 00:00:00	Findings:	4.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/27/2006 00:00:00	Findings:	.5 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	11/27/2006 00:00:00	Findings:	.2 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	11/27/2006 00:00:00	Findings:	.9 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	11/27/2006 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/16/2006 00:00:00	Findings:	4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/16/2006 00:00:00	Findings:	.5 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	08/16/2006 00:00:00	Findings:	.2 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	08/16/2006 00:00:00	Findings:	.9 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	08/16/2006 00:00:00	Findings:	.29 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08/16/2006 00:00:00	Findings:	3 UG/L
Chemical:	ARSENIC		
Sample Collected:	08/16/2006 00:00:00	Findings:	105 UG/L
Chemical:	BARIUM		
Sample Collected:	05/04/2006 00:00:00	Findings:	5.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/04/2006 00:00:00	Findings:	4.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/26/2006 00:00:00	Findings:	3.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/23/2006 00:00:00	Findings:	160 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	01/23/2006 00:00:00	Findings:	140 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		

Sample Collected:	01/23/2006 00:00:00	Findings:	41 MG/L
Chemical:	CALCIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	8.3 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	12 MG/L
Chemical:	SODIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	15 MG/L
Chemical:	CHLORIDE		
Sample Collected:	01/23/2006 00:00:00	Findings:	.29 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	01/23/2006 00:00:00	Findings:	210 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	01/23/2006 00:00:00	Findings:	- .163
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	01/23/2006 00:00:00	Findings:	3.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/23/2006 00:00:00	Findings:	130 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	01/23/2006 00:00:00	Findings:	7.57
Chemical:	PH, LABORATORY		
Sample Collected:	01/23/2006 00:00:00	Findings:	340 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	01/23/2006 00:00:00	Findings:	16 C
Chemical:	SOURCE TEMPERATURE C		
Sample Collected:	01/04/2006 00:00:00	Findings:	4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/13/2005 00:00:00	Findings:	4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/30/2005 00:00:00	Findings:	3.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/02/2005 00:00:00	Findings:	4.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/05/2005 00:00:00	Findings:	3.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/07/2005 00:00:00	Findings:	3.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2005 00:00:00	Findings:	4.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/02/2005 00:00:00	Findings:	3.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/08/2005 00:00:00	Findings:	3.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/25/2005 00:00:00	Findings:	3.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/18/2005 00:00:00	Findings:	3.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/26/2005 00:00:00	Findings:	3.9 MG/L
Chemical:	NITRATE (AS NO3)		

Sample Collected:	02/16/2005 00:00:00	Findings:	13.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/01/2005 00:00:00	Findings:	6.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/25/2005 00:00:00	Findings:	5 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	01/25/2005 00:00:00	Findings:	1.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	01/25/2005 00:00:00	Findings:	8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/25/2005 00:00:00	Findings:	.51 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	12/28/2004 00:00:00	Findings:	3.7 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	12/28/2004 00:00:00	Findings:	1.2 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	12/28/2004 00:00:00	Findings:	9.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/28/2004 00:00:00	Findings:	14 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	12/28/2004 00:00:00	Findings:	.89 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	12/02/2004 00:00:00	Findings:	6 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	12/02/2004 00:00:00	Findings:	.8 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	12/02/2004 00:00:00	Findings:	2.5 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	12/02/2004 00:00:00	Findings:	.6 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	11/29/2004 00:00:00	Findings:	14 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/29/2004 00:00:00	Findings:	1 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	11/29/2004 00:00:00	Findings:	4.8 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/29/2004 00:00:00	Findings:	9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/29/2004 00:00:00	Findings:	1.7 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	11 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	1.3 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	4 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	7.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/26/2004 00:00:00	Findings:	1.7 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		

Sample Collected:	09/22/2004 00:00:00	Findings:	8.1 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	.77 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	3 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	7.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/22/2004 00:00:00	Findings:	.9 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	09/17/2004 00:00:00	Findings:	.83 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	09/16/2004 00:00:00	Findings:	.8 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	3.8 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	2.2 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	6.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2004 00:00:00	Findings:	.6 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	4.5 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	1.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	6.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/14/2004 00:00:00	Findings:	2.1 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	07/14/2004 00:00:00	Findings:	.82 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	.96 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	5.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/04/2004 00:00:00	Findings:	5.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/06/2004 00:00:00	Findings:	5.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/03/2004 00:00:00	Findings:	5.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/29/2003 00:00:00	Findings:	.22 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	09/29/2003 00:00:00	Findings:	109 UG/L
Chemical:	BARIUM		
Sample Collected:	09/29/2003 00:00:00	Findings:	3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/29/2003 00:00:00	Findings:	1.8 UG/L
Chemical:	TETRACHLOROETHYLENE		

Sample Collected:	05/29/2003 00:00:00	Findings:	.97 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	.66 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	.92 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	08/08/2002 00:00:00	Findings:	2.9 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	1.2 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	7.1 MG/L
Chemical:	NITRATE (AS NO3)		

B7
South **CA WELLS** **1249**
1/2 - 1 Mile
Lower

Water System Information:

Prime Station Code:	01S/10W-07A06 S	User ID:	4TH
FRDS Number:	1910009001	County:	Los Angeles
District Number:	07	Station Type:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Water Type:	Well/Groundwater	Well Status:	Active Treated
Source Lat/Long:	340600.0 1175800.0	Precision:	Undefined
Source Name:	WELL 01 MAIN ST. EAST - TREATED		
System Number:	1910009		
System Name:	VALLEY COUNTY WATER DIST.		
Organization That Operates System:			
	14521 E RAMONA BLD BALDWIN PARK, CA 91706		
Pop Served:	45000	Connections:	11664
Area Served:	BALDWIN PARK		
Sample Collected:	12/11/2007 00:00:00	Findings:	1.2 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	12/11/2007 00:00:00	Findings:	8.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/28/2007 00:00:00	Findings:	.95 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/28/2007 00:00:00	Findings:	8.43 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/19/2007 00:00:00	Findings:	8.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/19/2007 00:00:00	Findings:	1.3 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	10/23/2007 00:00:00	Findings:	8.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/23/2007 00:00:00	Findings:	1.1 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/26/2007 00:00:00	Findings:	1.2 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/22/2007 00:00:00	Findings:	.6 UG/L
Chemical:	TETRACHLOROETHYLENE		

Sample Collected:	08/22/2007 00:00:00	Findings:	8.15 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/13/2007 00:00:00	Findings:	.93 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/13/2007 00:00:00	Findings:	8.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/17/2007 00:00:00	Findings:	8.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/17/2007 00:00:00	Findings:	.71 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	06/12/2007 00:00:00	Findings:	.73 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	06/12/2007 00:00:00	Findings:	9.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/30/2007 00:00:00	Findings:	.7 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	05/30/2007 00:00:00	Findings:	7.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/15/2007 00:00:00	Findings:	.68 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/17/2007 00:00:00	Findings:	.69 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	03/19/2007 00:00:00	Findings:	.56 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	02/20/2007 00:00:00	Findings:	6.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/23/2007 00:00:00	Findings:	.53 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/27/2006 00:00:00	Findings:	6.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/16/2006 00:00:00	Findings:	6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/04/2006 00:00:00	Findings:	5.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/04/2006 00:00:00	Findings:	5.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/19/2006 00:00:00	Findings:	5.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/07/2006 00:00:00	Findings:	4.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/08/2006 00:00:00	Findings:	4.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/26/2006 00:00:00	Findings:	5.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/23/2006 00:00:00	Findings:	43 MG/L
Chemical:	CALCIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	8.8 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	9.8 MG/L
Chemical:	SODIUM		

Sample Collected:	01/23/2006 00:00:00	Findings:	2.9 MG/L
Chemical:	POTASSIUM		
Sample Collected:	01/23/2006 00:00:00	Findings:	8.8 MG/L
Chemical:	CHLORIDE		
Sample Collected:	01/23/2006 00:00:00	Findings:	.28 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	01/23/2006 00:00:00	Findings:	.12 MG/L
Chemical:	FOAMING AGENTS (MBAS)		
Sample Collected:	01/23/2006 00:00:00	Findings:	210 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	01/23/2006 00:00:00	Findings:	- .162
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	01/23/2006 00:00:00	Findings:	4.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	01/23/2006 00:00:00	Findings:	140 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	01/23/2006 00:00:00	Findings:	160 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	01/23/2006 00:00:00	Findings:	130 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	01/23/2006 00:00:00	Findings:	7.55
Chemical:	PH, LABORATORY		
Sample Collected:	01/23/2006 00:00:00	Findings:	320 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	01/23/2006 00:00:00	Findings:	16 C
Chemical:	SOURCE TEMPERATURE C		
Sample Collected:	01/04/2006 00:00:00	Findings:	4.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/13/2005 00:00:00	Findings:	4.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/30/2005 00:00:00	Findings:	2 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	11/30/2005 00:00:00	Findings:	4.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/30/2005 00:00:00	Findings:	.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	11/02/2005 00:00:00	Findings:	5.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/05/2005 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/07/2005 00:00:00	Findings:	3.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2005 00:00:00	Findings:	2 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	08/25/2005 00:00:00	Findings:	.31 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08/25/2005 00:00:00	Findings:	3.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2005 00:00:00	Findings:	.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		

Sample Collected:	08/02/2005 00:00:00	Findings:	4.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/08/2005 00:00:00	Findings:	4.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/26/2005 00:00:00	Findings:	.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	05/26/2005 00:00:00	Findings:	2 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	05/26/2005 00:00:00	Findings:	4.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/25/2005 00:00:00	Findings:	4.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/13/2005 00:00:00	Findings:	.54 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	03/24/2005 00:00:00	Findings:	.91 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	03/24/2005 00:00:00	Findings:	.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	03/24/2005 00:00:00	Findings:	2 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	03/24/2005 00:00:00	Findings:	.6 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	03/24/2005 00:00:00	Findings:	6.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/26/2004 00:00:00	Findings:	36 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	20 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/26/2004 00:00:00	Findings:	16 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	7.8 UG/L
Chemical:	PERCHLORATE		
Sample Collected:	10/26/2004 00:00:00	Findings:	1.1 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	10/26/2004 00:00:00	Findings:	110 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	6.9 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	10/26/2004 00:00:00	Findings:	2 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	10/26/2004 00:00:00	Findings:	1.4 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	09/22/2004 00:00:00	Findings:	30 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	21 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/22/2004 00:00:00	Findings:	11 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	5.6 UG/L
Chemical:	PERCHLORATE		

Sample Collected:	09/22/2004 00:00:00	Findings:	78 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	7.8 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	09/22/2004 00:00:00	Findings:	1.7 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	09/22/2004 00:00:00	Findings:	.92 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	08/25/2004 00:00:00	Findings:	55 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	6.2 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	8.7 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	.9 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	08/25/2004 00:00:00	Findings:	21 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/25/2004 00:00:00	Findings:	19.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/25/2004 00:00:00	Findings:	1.3 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	08/19/2004 00:00:00	Findings:	8.9 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	62 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	5 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	1.3 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	08/19/2004 00:00:00	Findings:	.78 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	08/19/2004 00:00:00	Findings:	22 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/19/2004 00:00:00	Findings:	20 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/14/2004 00:00:00	Findings:	46 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	07/14/2004 00:00:00	Findings:	2.6 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	07/14/2004 00:00:00	Findings:	1 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	07/14/2004 00:00:00	Findings:	.61 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	07/14/2004 00:00:00	Findings:	16 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	07/14/2004 00:00:00	Findings:	6.4 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	.6 UG/L
Chemical:	TOTAL TRIHALOMETHANES		

Sample Collected:	06/02/2004 00:00:00	Findings:	38 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	2.5 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	.7 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	06/02/2004 00:00:00	Findings:	9.9 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	06/02/2004 00:00:00	Findings:	19.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/02/2004 00:00:00	Findings:	4.2 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	05/13/2004 00:00:00	Findings:	3.2 UG/L
Chemical:	DICHLOROMETHANE		
Sample Collected:	05/13/2004 00:00:00	Findings:	22 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	05/13/2004 00:00:00	Findings:	2.1 UG/L
Chemical:	1,1-DICHLOROETHANE		
Sample Collected:	05/13/2004 00:00:00	Findings:	8.4 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	05/13/2004 00:00:00	Findings:	20.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/13/2004 00:00:00	Findings:	3.7 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	05/05/2004 00:00:00	Findings:	26 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	05/05/2004 00:00:00	Findings:	1.8 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	05/05/2004 00:00:00	Findings:	7.2 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	05/05/2004 00:00:00	Findings:	19.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	05/05/2004 00:00:00	Findings:	3 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	04/06/2004 00:00:00	Findings:	15 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/06/2004 00:00:00	Findings:	.98 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	04/06/2004 00:00:00	Findings:	5.2 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	04/06/2004 00:00:00	Findings:	17 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/06/2004 00:00:00	Findings:	2.2 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	06/02/2003 00:00:00	Findings:	100 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	06/02/2003 00:00:00	Findings:	8 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	06/02/2003 00:00:00	Findings:	2.5 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		

Sample Collected:	06/02/2003 00:00:00	Findings:	31 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	06/02/2003 00:00:00	Findings:	17 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/02/2003 00:00:00	Findings:	13 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	06/02/2003 00:00:00	Findings:	1.2 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	04/01/2003 00:00:00	Findings:	1.4 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	04/01/2003 00:00:00	Findings:	61 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/01/2003 00:00:00	Findings:	8.7 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	04/01/2003 00:00:00	Findings:	1.9 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	04/01/2003 00:00:00	Findings:	.84 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	04/01/2003 00:00:00	Findings:	25 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	04/01/2003 00:00:00	Findings:	10 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	12/23/2002 00:00:00	Findings:	1.2 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	12/23/2002 00:00:00	Findings:	1.2 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	12/23/2002 00:00:00	Findings:	54 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	12/23/2002 00:00:00	Findings:	6.1 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	12/23/2002 00:00:00	Findings:	1.6 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	12/23/2002 00:00:00	Findings:	.72 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	12/23/2002 00:00:00	Findings:	20 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	12/23/2002 00:00:00	Findings:	7.8 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	12/03/2002 00:00:00	Findings:	1.5 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	12/03/2002 00:00:00	Findings:	1.5 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	12/03/2002 00:00:00	Findings:	58 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	12/03/2002 00:00:00	Findings:	7 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	12/03/2002 00:00:00	Findings:	1.8 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	12/03/2002 00:00:00	Findings:	.82 UG/L
Chemical:	1,2-DICHLOROETHANE		

Sample Collected:	12/03/2002 00:00:00	Findings:	23 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	12/03/2002 00:00:00	Findings:	8 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	49 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	5.1 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	1.5 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	11/04/2002 00:00:00	Findings:	17 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	16 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	11/04/2002 00:00:00	Findings:	6.9 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	1.4 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	11/04/2002 00:00:00	Findings:	46 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	4.6 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	1.3 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	11/04/2002 00:00:00	Findings:	.65 UG/L
Chemical:	1,2-DICHLOROETHANE		
Sample Collected:	11/04/2002 00:00:00	Findings:	16 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	6.5 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	11/04/2002 00:00:00	Findings:	1.4 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	10/02/2002 00:00:00	Findings:	2.3 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	10/02/2002 00:00:00	Findings:	1 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	10/02/2002 00:00:00	Findings:	14 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	10/02/2002 00:00:00	Findings:	4.7 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	10/02/2002 00:00:00	Findings:	1.2 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	10/02/2002 00:00:00	Findings:	1.2 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	10/02/2002 00:00:00	Findings:	47 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/03/2002 00:00:00	Findings:	9.4 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	09/03/2002 00:00:00	Findings:	3.4 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		

Sample Collected:	09/03/2002 00:00:00	Findings:	.97 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	09/03/2002 00:00:00	Findings:	31 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	09/03/2002 00:00:00	Findings:	.61 UG/L
Chemical:	1,1-DICHLOROETHANE		
Sample Collected:	09/03/2002 00:00:00	Findings:	3.1 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	09/03/2002 00:00:00	Findings:	.75 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	08/08/2002 00:00:00	Findings:	24 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	2.3 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	.64 UG/L
Chemical:	1,1,1-TRICHLOROETHANE		
Sample Collected:	08/08/2002 00:00:00	Findings:	8.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	13 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/08/2002 00:00:00	Findings:	3 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	08/08/2002 00:00:00	Findings:	.73 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	08/08/2002 00:00:00	Findings:	.28 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08/08/2002 00:00:00	Findings:	2.1 UG/L
Chemical:	ARSENIC		
Sample Collected:	08/08/2002 00:00:00	Findings:	150 UG/L
Chemical:	BARIUM		
Sample Collected:	08/07/2002 00:00:00	Findings:	21 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	08/07/2002 00:00:00	Findings:	7.8 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	07/09/2002 00:00:00	Findings:	12 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	07/09/2002 00:00:00	Findings:	1.2 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	07/09/2002 00:00:00	Findings:	4.8 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	07/09/2002 00:00:00	Findings:	1.6 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	06/04/2002 00:00:00	Findings:	.66 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	06/04/2002 00:00:00	Findings:	9.2 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	06/04/2002 00:00:00	Findings:	.89 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	06/04/2002 00:00:00	Findings:	3.9 UG/L
Chemical:	TRICHLOROETHYLENE		

Sample Collected:	06/04/2002 00:00:00	Findings:	1.1 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	05/14/2002 00:00:00	Findings:	6.8 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	05/14/2002 00:00:00	Findings:	.52 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	05/14/2002 00:00:00	Findings:	2.4 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	05/14/2002 00:00:00	Findings:	.71 UG/L
Chemical:	CIS-1,2-DICHLOROETHYLENE		
Sample Collected:	05/10/2002 00:00:00	Findings:	2.1 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	05/10/2002 00:00:00	Findings:	.51 UG/L
Chemical:	1,1-DICHLOROETHYLENE		
Sample Collected:	05/10/2002 00:00:00	Findings:	5 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/02/2002 00:00:00	Findings:	3.4 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	04/02/2002 00:00:00	Findings:	1.6 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	04/02/2002 00:00:00	Findings:	14 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/19/2002 00:00:00	Findings:	14 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/12/2002 00:00:00	Findings:	2.8 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	03/12/2002 00:00:00	Findings:	1.3 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	02/26/2002 00:00:00	Findings:	1.2 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	02/26/2002 00:00:00	Findings:	.65 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	02/15/2002 00:00:00	Findings:	1.6 UG/L
Chemical:	TETRACHLOROETHYLENE		
Sample Collected:	02/15/2002 00:00:00	Findings:	.81 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	01/08/2002 00:00:00	Findings:	.56 UG/L
Chemical:	TETRACHLOROETHYLENE		

C8
SW
1/2 - 1 Mile
Lower

FED USGS **USGS3135064**

Agency cd:	USGS	Site no:	340552117584003
Site name:	001S011W12J005S		
Latitude:	340552		
Longitude:	1175840	Dec lat:	34.09778622
Dec lon:	-117.97867618	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	037
Country:	US	Land net:	Not Reported
Location map:	BALDWIN PARK	Map scale:	24000
Altitude:	Not Reported		
Altitude method:	Not Reported		
Altitude accuracy:	Not Reported		
Altitude datum:	Not Reported		
Hydrologic:	San Gabriel. California. Area = 713 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	600	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	9479335800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

C9
SW
1/2 - 1 Mile
Lower

FED USGS **USGS3135062**

Agency cd:	USGS	Site no:	340552117584001
Site name:	001S011W12J003S		
Latitude:	340552		
Longitude:	1175840	Dec lat:	34.09778622
Dec lon:	-117.97867618	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	037
Country:	US	Land net:	Not Reported
Location map:	BALDWIN PARK	Map scale:	24000
Altitude:	Not Reported		
Altitude method:	Not Reported		
Altitude accuracy:	Not Reported		
Altitude datum:	Not Reported		
Hydrologic:	San Gabriel. California. Area = 713 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	PST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	200	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	9479335800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

C10
SW
1/2 - 1 Mile
Lower

FED USGS **USGS3135063**

Agency cd:	USGS	Site no:	340552117584002
Site name:	001S001W12J001S		
Latitude:	340552		
Longitude:	1175840	Dec lat:	34.09778622
Dec lon:	-117.97867618	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	037
Country:	US	Land net:	Not Reported
Location map:	BALDWIN PARK	Map scale:	24000
Altitude:	Not Reported		
Altitude method:	Not Reported		
Altitude accuracy:	Not Reported		
Altitude datum:	Not Reported		
Hydrologic:	San Gabriel. California. Area = 713 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	600	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	9479335800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zip	Total Sites	> 4 Pci/L	Pct. > 4 Pci/L
91706	4	0	0.00

Federal EPA Radon Zone for LOS ANGELES County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for LOS ANGELES COUNTY, CA

Number of sites tested: 63

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.711 pCi/L	98%	2%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	0.933 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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DTSC
Records

Appendix F

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY
GEORGE DEUKMEJIAN, GOVERNOR

DEPARTMENT OF HEALTH SERVICES
TOXIC SUBSTANCES CONTROL PROGRAM (REGION 3)
1405 N. SAN FERNANDO BOULEVARD, SUITE 300
BURBANK, CA 91504
(818) 567-3000

JUN 22 1990

Mr. Alistaire Callender
Woodward-Clyde Consultants
445 South Figueroa Street
Suite 2600
Los Angeles, California 90071

Dear Mr. Callender:

UNITED CONCRETE PIPE: REVIEW OF PRELIMINARY ENDANGERMENT ASSESSMENT

This Department has reviewed your June 14, 1990 Preliminary Endangerment Assessment report. The Department found that the site was properly characterized and appropriately sampled. Samples were analyzed for flammability (EPA Method 1010), pH (EPA Method 9045), Volatile organics (EPA Method 8240), semi-volatile organics ((EPA Method 8270), and acute aquatic toxicity. The analysis revealed that there were no significant concentrations of hazardous substances. Analytical results indicated that the mineral oil contamination along the pour line is non-hazardous with respect to acute aquatic toxicity. Since mineral oil is not listed as a hazardous substance in Title 22, Article 9, of the State of California Administrative Code, mineral oil contaminated soil along the pour line is not considered a threat to public health or the environment.

According to your information, the forthcoming demolition and development of the property will adequately mitigate hazards associated with the settling pond, cesspool, and underground storage tank. The Department has no objection to construction of the proposed development. However, all wastes should be properly characterized to determine whether they are hazardous, and should be handled according to all state and local disposal regulations. For oversight of the site demolition and excavation contact your local county health officials. The Department, based on data supplied in your report, concurs that the site does not appear to pose a significant threat to public health or the environment.

However, this does not preclude the state from requiring additional investigation for remediation measures for contaminants found to exist at this site and surrounding properties to protect public health or the environment.

PRELIMINARY ENDANGERMENT ASSESSMENT FOR THE UNITED CONCRETE PIPE MANUFACTURING FACILITY AT 14041 EAST LIVE OAK AVENUE IRWINDALE, CALIFORNIA

Prepared for:

California Department of Health Services
1405 San Fernando Boulevard, Suite 300
Burbank, California 91504

Submitted by:

The Koll Company
818 West Seventh Street, Suite 700
Los Angeles, California 90017

Prepared by:

Woodward-Clyde Consultants
203 North Golden Circle Drive
Santa Ana, California 92705

Project No. 904W217A
14 June 1990

PRELIMINARY ENDANGERMENT ASSESSMENT FOR THE UNITED CONCRETE PIPE MANUFACTURING FACILITY AT 14041 EAST LIVE OAK AVENUE IRWINDALE, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of a preliminary endangerment assessment (PEA) for the United Concrete Pipe (UCP) manufacturing facility in Irwindale, California. The PEA has been prepared using the draft guidance document of the Toxic Substances Control Program, California Department of Health Services (DHS) (State of California, 1989).

The objective of the PEA was to evaluate whether current or past operations at the site have resulted in the release of hazardous substances, posing a threat to public health and the environment. Upon review of the PEA report, DHS would recommend either "no further action" or site characterization and remediation.

Woodward-Clyde Consultants (Woodward-Clyde) has conducted site assessments, including sampling and analysis of soil and water, at areas of concern at the site (Woodward-Clyde Consultants, 1988 and 1989). The data obtained in these assessments were used in the preparation of this PEA for the UCP facility.

The facility is in the closure process. The Koll Company plans to develop approximately 55 acres of the property as a commercial park, with office and light industrial buildings. The City of Irwindale is purchasing 17 acres for a retail development.

2.0 SITE HISTORY AND DESCRIPTION

2.1 Site Location

The 74-acre UCP facility is located at 14041 East Live Oak Avenue in Irwindale, California (Figure 1). The telephone number is: 818/337-1211. The legal description of the UCP facility is recorded in Book 6, pages 80 through 82, and Parcels 639 and 642 (see Figure 2), within Township 1 South, Range 10 West, Section 6, in the subdivision of the Rancho Azusa De Duarte, in the City of Irwindale, Los Angeles County.

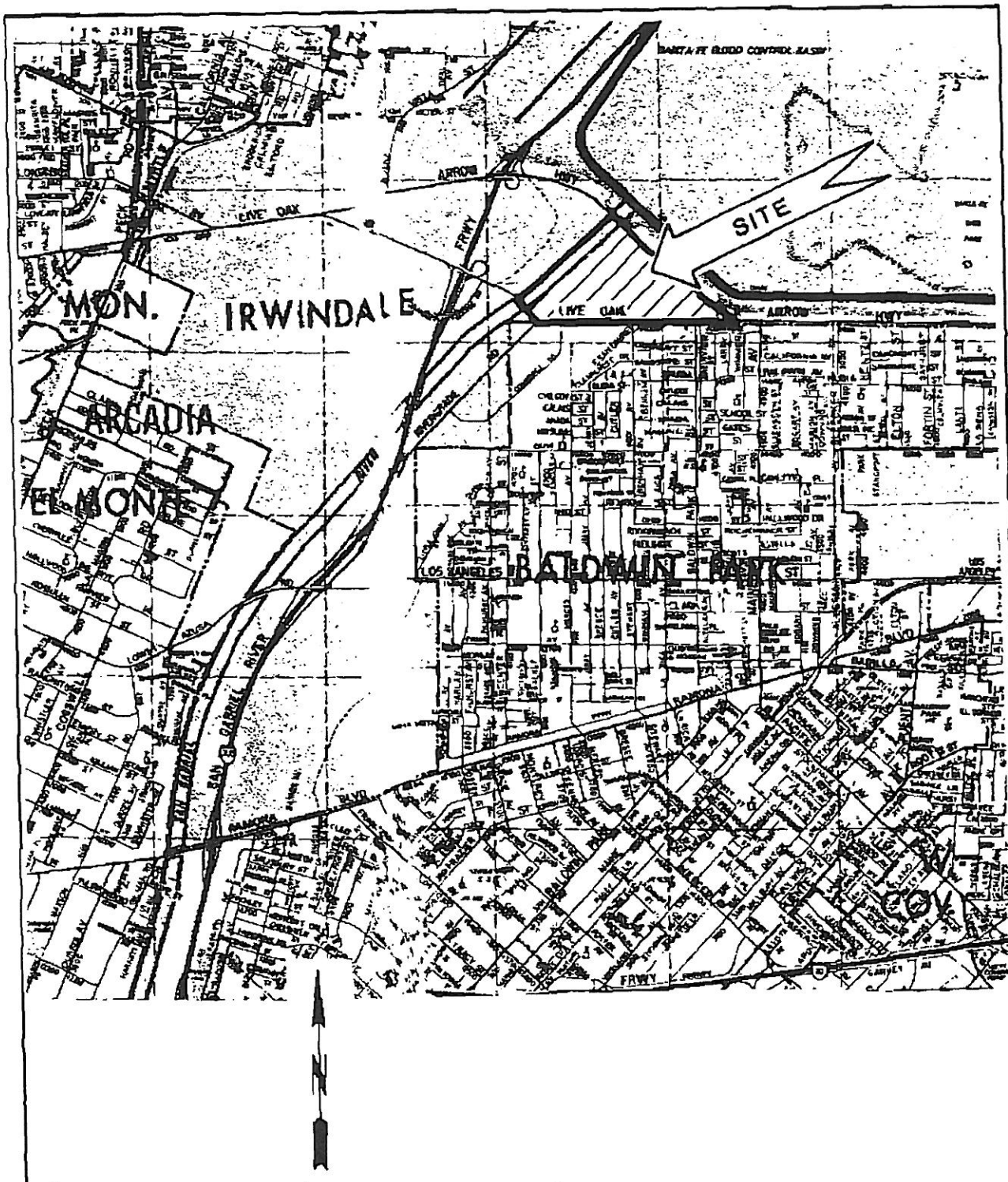
The facility has an EPA identification number for generation of waste oil; it is not listed on the Abandoned Site Program Information System (ASPIS) database.

2.2 Past and Current Site Activities

UCP has occupied this facility since it was constructed in 1936, and has manufactured a variety of types of concrete pipe at the facility since its inception. Figure 3 is a facility map showing site features.

The property is owned by UCP and was formerly operated as a concrete pipe manufacturing facility. No other businesses have been conducted on the premises by UCP or other corporations.

Two process activities at the facility produce effluent streams. In the centrifugal plant, paraffin (wax) is used in the concrete pipe form molds. Once the concrete pipe is set up, the paraffin is removed by steam. The bulk of the paraffin is contained immediately, but some residual amount remains within the steam cleaning effluent, which flows into one of two clarifiers. The clarifiers are composed of sections of concrete pipe buried vertically in the ground and connected near the bottom by horizontal pipe. The system



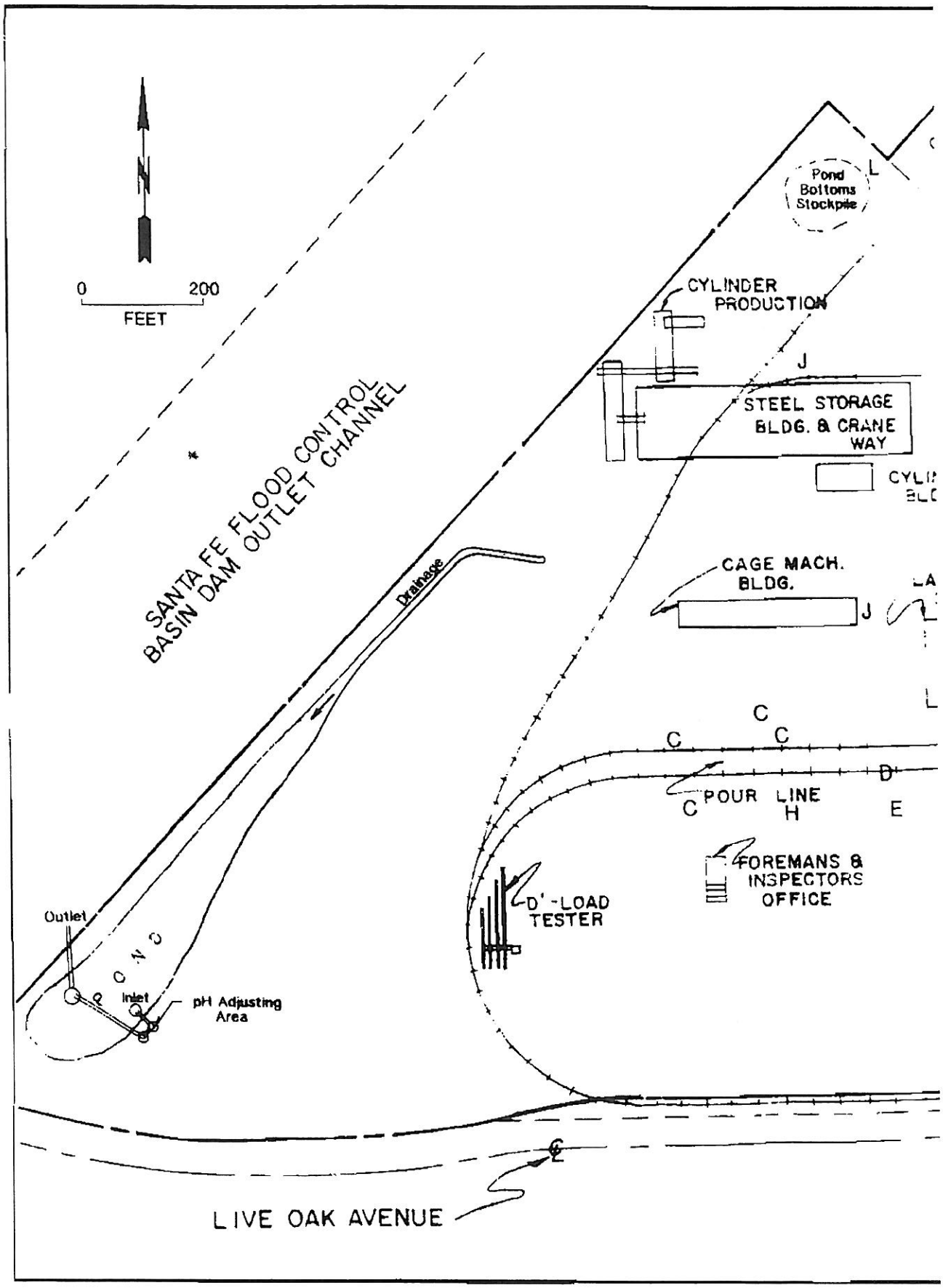
SCALE OF MAP PAGES: 1 INCH TO 2000 FEET
UNLESS OTHERWISE SHOWN

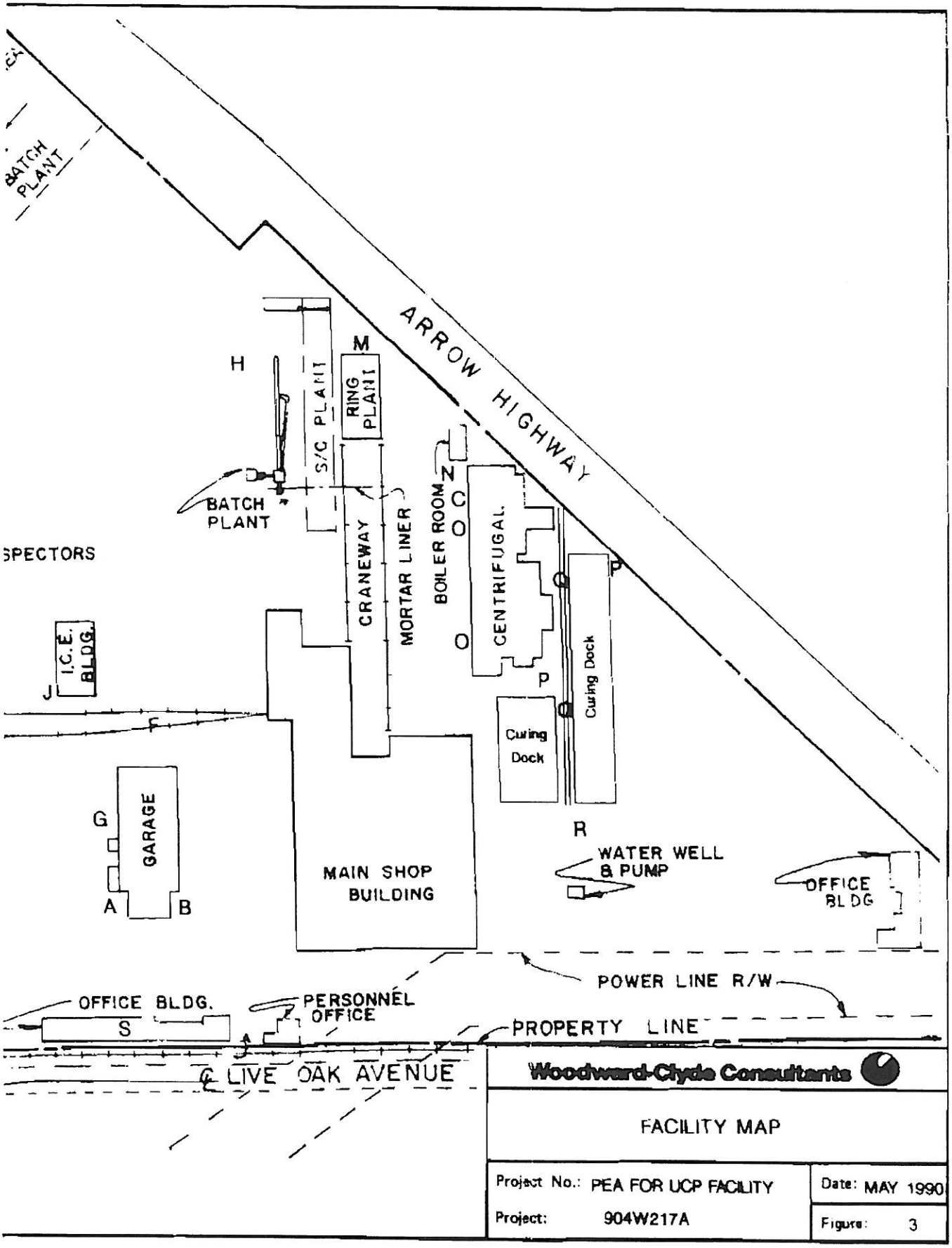
"Reproduced with permission granted by THOMAS BROS. MAPS. This map is copyrighted by THOMAS BROS. MAPS. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission."

SITE LOCATION MAP

Project No.: 904W217A	Date: MAY 1990	Project: PEA FOR UCP FACILITY	Fig. 1

Woodward-Clyde Consultants


0
200
FEET
SANTA FE FLOOD CONTROL
BASIN DAM OUTLET CHANNEL
Pond
Bottoms
Stockpile
CYLINDER
PRODUCTION
STEEL STORAGE
BLDG. & CRANE
WAY
CAGE MACH.
BLDG.
Drainage
POUR
H
FOREMANS &
INSPECTORS
OFFICE
D'-LOAD
TESTER
Outlet
Inlet
pH Adjusting
Area
LIVE OAK AVENUE



Woodward-Clyde Consultants

FACILITY MAP

Project No.: PEA FOR UCP FACILITY	Date: MAY 1990
Project: 904W217A	Figure: 3

allows the paraffin to float to the surface of the first pipe(s) and be skimmed off manually. The clarified effluent then flows out the top of the last pipe section and travels via a gutter to an underground drain, which empties into the onsite settling pond located on the west side of the facility.

The water that drains to the settling pond is recycled for use in curing the manufactured concrete pipe, which is the second process with an effluent stream. Rainbird sprinklers keep the surface of the concrete pipe moist during the curing period. Runoff water from this process either evaporates or flows into a surface drain or channel and is directed back to the settling ponds for recycling. Appendix A contains flow diagrams of the manufacturing processes that were used at the facility.

On the average, UCP has manufactured approximately 84,000 tons of concrete pipes annually in the last 3 years. In the manufacturing of concrete pipes, various raw materials and chemicals were used. These included aggregate(s) (gravel and rock), sand, cement (Types 2 and 5), steel (rods, bands, and mains), and small quantities of form oil (predominantly mineral oil), Amercoat (coal tar epoxy), concrete plasticizer (WRDA-19), and admixture for concrete. Material safety data sheets (MSDS) are provided in Appendix B for those chemicals which have MSDSs.

2.3 Hazardous Waste Management

According to information supplied by UCP in response to an inquiry by the Environmental Protection Agency concerning the San Gabriel Valley groundwater investigation, the facility does not generate, store, treat, or dispose of hazardous

waste and has never used chlorinated solvents on site. A review of files available at regulatory agencies' offices supported this claim. These agencies included the following:

- U.S. Environmental Protection Agency (EPA), Region IX
- Los Angeles County Department of Public Works (LACDPW)
- California Department of Health Services
- California Regional Water Quality Control Board (RWQCB) - Los Angeles Region
- Los Angeles County Department of Health Services
- Los Angeles County Fire Department
- South Coast Air Quality Management District (SCAQMD).

There are no hazardous waste permits currently or previously held by the facility. However, UCP has an NPDES permit from the California Regional Water Quality Control Board (RWQCB) for the discharge of process water, and several permits from the South Coast Air Quality Management District (SCAQMD) for dust control. A listing of permits is provided in Table 1. The EPA identification number was for the generation of waste oil.

There have been no inspections or citations given by regulatory agencies concerning waste management at the site. Woodward-Clyde personnel visited the UCP facility on 9 December 1988 during the initial preliminary site assessment. The observations made during this site visit are summarized in Table 2.

TABLE 1

PERTINENT ENVIRONMENTAL PERMITS FOR UCP FACILITY

Agency	Permit No.	Where Applied
SCAQMD	042863	Conveyor
SCAQMD	M33778	Boiler
SCAQMD	M48046	Illegal equipment category
SCAQMD	M49788	Illegal equipment category
SCAQMD	M49789	Concrete batch plant
SCAQMD	A13049	Dust filter
SCAQMD	A12030	Conveyor
SCAQMD	A12031	Open-air abrasive blasting
SCAQMD	P08460	Concrete batch plant
SCAQMD	P08461	Dust filter
SCAQMD	P06446	Concrete batch plant
SCAQMD	P06447	Concrete batch plant
SCAQMD	P07440	Annual billing
SCAQMD	P08464	Open-air abrasive blasting
SCAQMD	P29263	Concrete batch plant
SCAQMD	P29264	Spraying device
SCAQMD	P55816	Boiler
SCAQMD	P55817	Boiler
SCAQMD	P55815	Boiler
SCAQMD	M08168	Open-air abrasive blasting
SCAQMD	M08169	Plasma arc cutting torch
SCAQMD	M08170	Conveyor
RWQCB	CA0001597	NPDES
US ARMY COE	DACW09-3-85-21	Pond discharge
LACDPW	HMUSP157	Underground storage tanks
EPA	CAD003986718	Hazardous materials

TABLE 2

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN IDENTIFIED IN THE DECEMBER 1988 SITE VISIT

Area(1)	Environmental Concern
A	Underground fuel storage tanks: (1) One 10,000-gallon unleaded, steel, single-wall, with two vadose-zone monitoring wells (2) One 10,000-gallon diesel, fiberglass, double-wall, with annular liquid sensor. Both tanks were installed under the direction of LACDPW, and permits have been applied for. Also, two 10,000-gallon and one 1,000-gallon fuel tanks have been removed from this area. LACDPW has signed off the excavation as clean.
B	Waste oil sump with known soil contamination.
C	Significant surface staining in form oil area.
D	Large stained area under rail equipment, next to vertical casting area.
E	55-gallon drum set up for dispensing; unknown content; surface staining around drum and soil.
F	Rail crane maintenance; surface staining.
G	Engine steam-cleaning area with asphalt dike and soil bottom. Several 55-gallon drums next to it labeled as hydraulic oil and thinner. Possible solvent use in this area.
H	Several drums labeled as WRDA-19 superplasticizer, ASTM C-494.
I	Pallet of 1- to 5-gallon containers of paints and solvents sitting in the open.
J	Electrical transformers containing PCBs; labeled, diked, and fenced.
K	55-gallon drums labeled McGean-Rohco, Inc., form finish oil (Product # 15607).
L	55-gallon drum set up for dispensing thinner. No surface staining on gravel soil.
M	Water draining out the back wall of the ring plant, possibly from metal cutting processes.
N	One 8,000-gallon and two 10,000-gallon diesel tanks excavated and removed from this area. LACDPW has signed off the excavations as clean.
O	Settling pond.
P	Paraffin collecting areas.
Q	Hydraulic fluid all around stripper tracks.
R	20-gallon drum of weed killer on pallet, in open.
S	Electrical transformer in basement crawlspace; unlabeled and possibly PCB-containing.

(1) See Figure 3, Facility Map.

2.4 Management of Underground Storage Tanks

There were seven underground storage tanks (USTs) at the UCP facility which had been removed as of March 1989. These USTs, ranging in capacity from 1,000 gallons to 10,000 gallons, were used to store gasoline, diesel fuel, and waste oil. The removal of these USTs and affected soil was performed with closure permits from the Los Angles County Department of Public Works (LACDPW) during the period of October 1987 to March 1989.

Currently, there are two 10,000-gallon, active USTs: one stores unleaded gasoline, and the other stores diesel. These two tanks are operating with a permit (No. HMUSP157) from the LACDPW. According to the proposed site development plan, the tanks will be removed prior to site grading. Tank removal records are included in Appendix C.

3.0 APPARENT PROBLEM

Woodward-Clyde conducted a field investigation during the period of December 1988 to January 1989 to evaluate potential areas of concern identified in the preliminary site assessment. Trenches were excavated and samples collected from the surface and at varying depths from Areas B, C, D, E, F, M, P, and Q (see Figure 4). In addition, samples of water and sludge were collected from the ponds (Area O), and samples of solids were collected from onsite waste piles. Details of the field investigation and findings are summarized in Section 4, Sampling Activities.

4.0 SAMPLING ACTIVITIES

Woodward-Clyde conducted a field investigation to assess the potential presence and concentrations of petroleum

hydrocarbons and chemicals of concern at eight areas. Water and sludge samples from the settling ponds and solid samples from onsite waste piles were also collected for laboratory analysis. Details of the field investigation program are provided in Appendix D. Figure 4 shows sampling locations. Analytical results are included in Appendix E and are summarized in Tables 3 and 4.

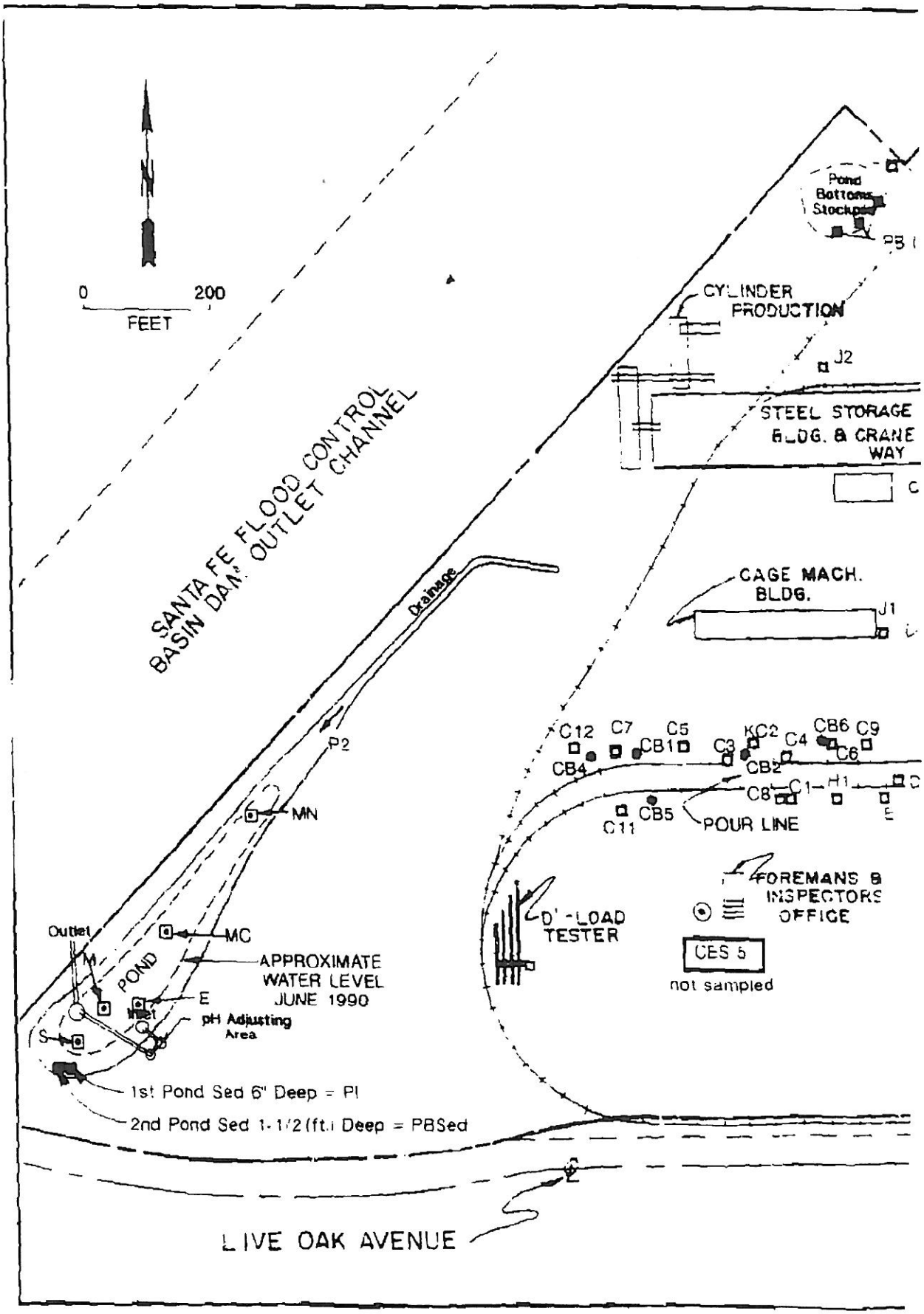
4.1 Pour Line - Area C

Soil samples were collected from trenches and borings along the pour line (Area C) at the locations shown on Figure 4. The analytical data presented in Table 3 show that total petroleum hydrocarbons (TPH) at concentrations exceeding 100 ppm were present at depths of up to approximately 24 feet at locations along the pour line. At depths greater than 24 feet, TPH concentrations declined to levels below 100 ppm.

4.2 Centrifugal Line - Areas N, O, Q

This area is the oldest part of the facility, and visible soil staining was present. Trenches were excavated and borings advanced in the area outside of the building, because equipment access to the interior of the building was limited. The area was generally covered with layers of asphalt and/or concrete of varying thicknesses.

Generally, in the areas where it was present, the visible staining appeared to be confined to the top 8 to 10 inches of soil. The material in and on the soil appeared to be hydrocarbons (such as wax or form oil) associated with the manufacturing operation. No evidence of volatile organic compounds was uncovered during field work. Screening of soil for volatiles was performed with an organic vapor analyzer (OVA), using a headspace analysis technique.


0
200
FEET
SANTA FE FLOOD CONTROL BASIN DAM OUTLET CHANNEL
Drainage
Pond Bottoms Stockpile
PB 1
CYLINDER PRODUCTION
J2
STEEL STORAGE BLDG. & CRANE WAY
C
CAGE MACH. BLDG.
J1
C12
C7
C5
CB1
C3
KC2
C4
CB6
C9
C6
CB4
CB2
C8
C1
H1
D
E
C11
CB5
POUR LINE
FOREMANS & INSPECTORS OFFICE
D' -LOAD TESTER
CES 5
not sampled
P2
MN
Outlet
MC
M
POND
APPROXIMATE WATER LEVEL JUNE 1990
E
Inlet
pH Adjusting Area
S
1st Pond Sed 6" Deep = PI
2nd Pond Sed 1-1/2 (ft.) Deep = PBSed
LIVE OAK AVENUE

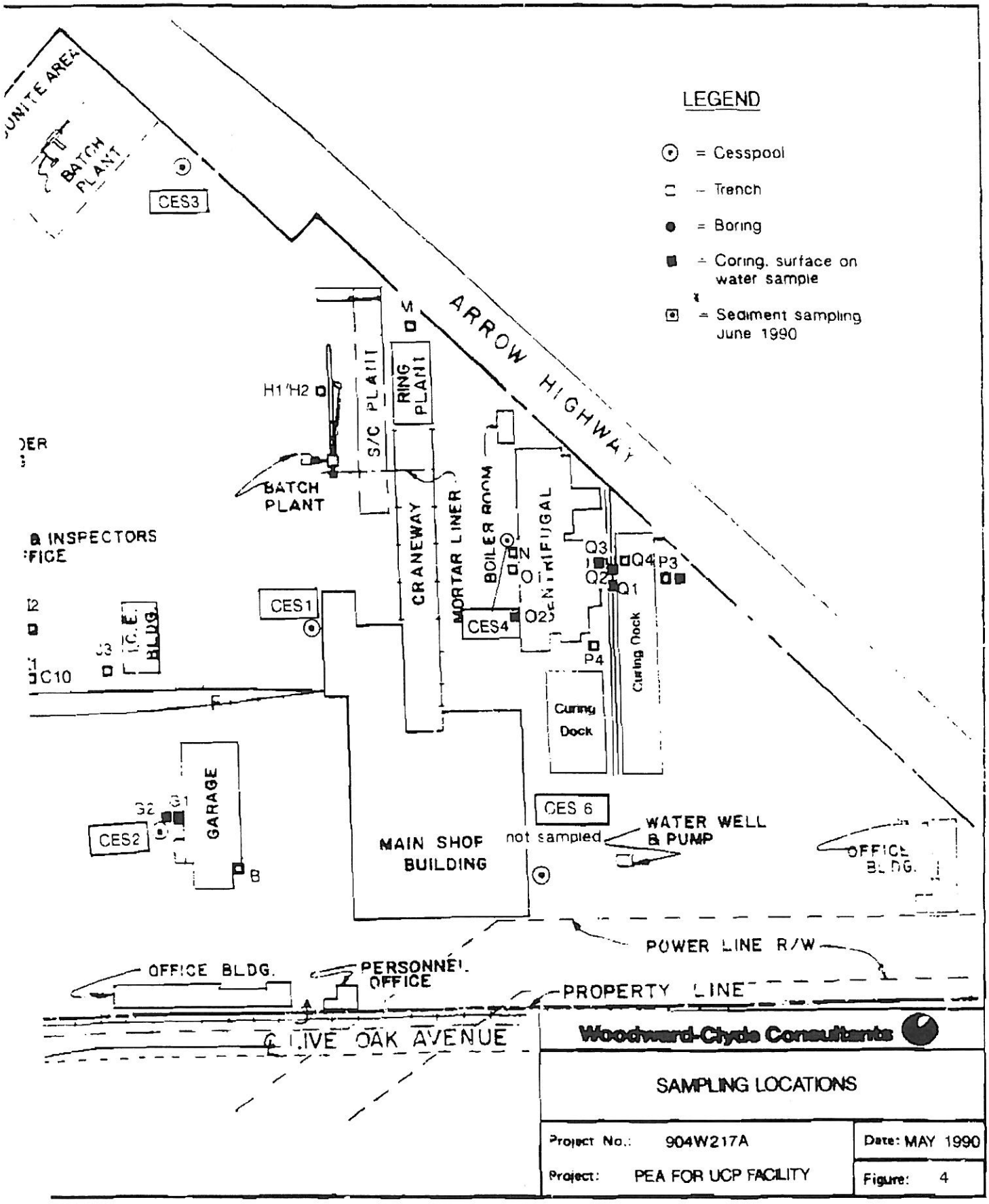

LEGEND
= Cesspool
= Trench
= Boring
= Coring, surface on water sample
= Sediment sampling June 1990
ARROW HIGHWAY
BATCH PLANT
CES3
S/C PLANT
RING PLANT
H1
H2
BATCH PLANT
CRANEWAY
MORTAR LINER
BOILER ROOM
CENTRIFUGAL
Q3
Q4
P3
Q2
Q1
O1
O2
CES4
P4
CES1
Curing Dock
Curing Dock
INSPECTORS OFFICE
C10
GARAGE
CES2
MAIN SHOP BUILDING
CES 6
not sampled
WATER WELL & PUMP
OFFICE BLDG.
POWER LINE R/W
OFFICE BLDG.
PERSONNEL OFFICE
PROPERTY LINE
OLIVE OAK AVENUE
Woodward-Clyde Consultants
SAMPLING LOCATIONS
Project No.: 904W217A
Date: MAY 1990
Project: PEA FOR UCP FACILITY
Figure: 4

TABLE 3

ANALYTICAL RESULTS OF SOIL ANALYSES
(concentrations in mg/kg, or ppm, unless otherwise noted)

AREA	SAMPLE NO.	DEPTH (feet)	TPH[A]	GASOLINE	DIESEL FUEL	KEROSENE	MINERAL SPIRITS	C_8-C_{30} HYDROCARBONS	VOLATILE ORGANICS (ug/kg)	VOLATILES (C_8-C_{11})
B	B5	5	*	<10	610	<10	<10	10,000		
	B5	5		<10	310	<10	<10	6,400		
	B-Surf	Tank Contents	1,000,000	<10	83,600	<10	<10	<10		
	B (North)	10	38							
	B (South)	10	607							
C	C1-Surf	Surface	150,000						ND	
	C1-5	5	300						ND	
	C1-15	15	ND[B]						ND	
	C3	Surface		<10	49,000	<10	<10	9,900		
	C3	7							Toluene 9, all other ND	20
	C3	12	7,400	<10	<10	<10	<10	8,500		
	C4-Surf	Surface	ND					2,300		
	C4	5							<1 ppm	
	C4	15							<1 ppm	
	CK2	Surface		<10	<10	<10	<10	33,000	<1 ppm	
	CK2	15							<1 ppm	
	C5B	1	915							
	C5B	5	1,710							
	C5B	8	15,100							
	C5B	16	16,800							
	C6	1	82							
	C6	7	17							
	C7(18)[C]	3	2,500							
	C7(35)	10	3							
	C7(18)	11	4,450							
	C7(28)	12	6,380							
	C7(12)	15	11,500							
	C7(23)	17	10,800							
	C7(37)	17	ND							
	C8	2	9,680							
	C8(DUP)[D]	2	6,660							
	C8	16	ND							

A - TPH = total petroleum hydrocarbons (by EPA Method 418.1).
B - ND = not detected, see Appendix E for detection limits.
C - Numbers in parentheses represent distances relative to area of interest; see description of Sampling Program, Appendix D.
D - DUP = duplicate sample
* Blank spaces indicate that no samples were analyzed for that parameter.

TABLE 3 (continued)
ANALYTICAL RESULTS OF SOIL ANALYSES
(concentrations in mg/kg, or ppm, unless otherwise noted)

AREA	SAMPLE NO.	DEPTH (feet)	TPH[A]	GASOLINE	DIESEL FUEL	KEROSENE	MINERAL SPIRITS	C_8-C_{30} HYDROCARBONS	VOLATILE ORGANICS (ug/kg)	VOLATILES (C_8-C_{11})
C (contd)	C9(20)	2	11,700							
	C9(15)	6	1,540							
	C9(15)	10	503							
	C9(20)	15	ND							
	C10(12)	5	2,030							
	C10(20)	10	1,990							
	C10(DUP)	10	1,510							
	C10(12)	15	4							
	C10(22)	15	2,360							
	C11	2	8,260							
	CB1-1	10	159							
	CB1-2	19	153							
	CB1-3	31	58							
	CB1-4	46	28							
	CB1-5	50	13							
	CB1-6	54	6							
	CB2-1	5	5,260							
	CB2-2	7	4,800							
	CB2-3	13	2,940							
	CB2-4	24	662							
	CB2-5	45	18							
	CB2-6	50	18							
	CB3-1	12	149							
	CB3-2	20	106					*		
	CB3-3	35	11							
	CB4-1	5	570							
	CB4-2	9	4,200							
	CB4-3	19	582							
	CB4-4	28	87							
	CB5-2	14	140							
	CB5-3	33	31							
	CB6-1	5	18							
	CB6-4	28	ND							
	CB6-5	37	8							

A - TPH = total petroleum hydrocarbons (by EPA Method 418.1)
B - ND = not detected; see Appendix E for detection limits.
C - Numbers in parentheses represent distances relative to area of interest; see description of Sampling Program, Appendix D.
D - DUP = duplicate sample
* Blank spaces indicate that no samples were analyzed for that parameter.

TABLE 3 (continued)
ANALYTICAL RESULTS OF SOIL ANALYSES
(concentrations in mg/kg, or ppm, unless otherwise noted)

AREA	SAMPLE NO.	DEPTH (feet)	TPH[A]	GASOLINE	DIESEL FUEL	KEROSENE	MINERAL SPIRITS	C_8-C_{30} HYDROCARBONS	VOLATILE ORGANICS (µg/kg)	VOLATILES (C_8-C_{11})
E	E-Surf	Surface							ND	
	E-5	5							ND	4
G	G	1							ND	ND
L	L	Surface							ND	100 alkyl-benzenes; 2,000 aliphatic/ alicyclic hydrocarbons
	L	2							ND	ND
M	M	Surface							ND	3.0
	M	5							ND	ND
O	O1									
	O2								ND	ND
POND	P1(sediments)	0.5							ND	ND
	P2(sediments)	0.5							ND	ND
	P2(sediments)	0 5							ND	ND
POND (South)	PBSED2	1.5	4,430		2,540				ND	ND
POND BOTTOM	PB	Surface								
Q	Q	Surface							ND	ND
	Q1	1		ND	ND	ND	ND	ND	ND	ND
	Q2	1		ND	ND	ND	ND	1,100		
	Q3-4	4	13						ND	
	Q3-6	5	21							
	Q5-1	1	4							

A - TPH = total petroleum hydrocarbons (by EPA Method 418.1).
B - ND = Not Detected; see Appendix E for detection limits.
C - Numbers in parentheses represent distances relative to area of interest; see description of Sampling Program, Appendix D.
D - DUP = duplicate sample
* Blank spaces indicate that no samples were analyzed for that parameter.

TABLE 4

AQUEOUS ANALYTICAL RESULTS

Area and Sample No.	Volatile Organics (in ppb) (EPA Method 8240 or 601/602)	
Westerly Pond(1):		
P1 South	ND(2)	
P2 North	ND	
Ponds by Centrifigal Line:		
O1	methylene chloride toluene	57 2
O2	ND	
Cesspools:		
CES-1B	benzene total xylenes toluene	2 80 30
CES-2B	ethylbenzene	3
CES-3B	ND	
CES-4B	ND	

(1) Samples collected from north and south ends of pond; see Figure 4.
(2) ND = not detected; specific detection limits presented in Appendix E.

4.3 Batch Plant - Area H

WRDA-19, a concrete plasticizer and water-reducing compound was stored at the batch plant (Area H). Volatile organic compounds were not detected using headspace analysis by an OVA. Soil under the asphalt paving was stained, but no staining was noted at the 8- or 16-inch depths.

4.4 Thinner Storage Area/Ring Plant - Area L

A surface soil sample collected from the thinner storage area (Area L) and analyzed for volatile organic compounds by EPA Method 8240 contained 2,100 ppm of C_9-C_{11} hydrocarbons. A soil sample collected at a 5-foot depth did not contain measurable amounts of hydrocarbons or volatile organic compounds.

Soil samples were taken at the ring plant (Area M) and evaluated using EPA Method 8240. These samples showed no detectable concentrations of volatile organic compounds. Soil samples were also collected from an area where water drains out the back wall of the ring plant. UCP personnel reported that this water is non-contact cooling water used in the ring plant. The analytical results showed no detectable concentrations of volatile organic compounds in this area, except for 3 ppm of a C_8-C_{11} hydrocarbon fraction in a surface sample.

4.5 Solvent Usage Areas - Areas I and G

According to UCP personnel, there has been no significant solvent use at the facility. The area of suspected solvent storage/use identified, Area I, was investigated by installing trenches (I1 and I2). No visible evidence of solvents, such as a loss of integrity, was present on the

asphalt overlying this area, and excavation of the two trenches did not uncover evidence of volatile organic chemicals when the soil was screened with an OVA.

One other area of suspected solvent use was west of the garage area, where steam-cleaning of vehicles occurred. Again, trenches were excavated (G1 and G2), but no evidence of the presence of solvents, such as odor or elevated OVA readings, was observed in soil samples taken from the trenches. It should be noted that this area was covered by a concrete slab and asphalt.

4.6 Transformer Area - Area Q

According to information furnished by UCP, the polychlorinated biphenyls (PCBs) transformer dikes were installed in 1981. Concrete slabs existed at that time and presumably were poured prior to initial transformer installation. Probable dates of transformer installation are: poured pipe cage, Mach transformer, 1963; I.C.E. Building transformers, 1963; vertical cylinder plant transformers, 1968.

A soil sample from the transformer area (Area Q) was analyzed for PCBs; the concentration was not detectable at 1 µg/kg (ppb). Soil samples from the surface and from an approximately 5-foot depth were also collected and analyzed from Area J3, where a transformer is located. PCBs were not detected in the soil samples, and there was no visible discoloration of the soil. Trenches were also excavated adjacent to the transformers at the steel storage building (J2) and the cage machine building (J1). Again, no visible evidence of soil contamination was present.

4.7 Ponds

There are a number of settling ponds at the site. The major pond is located on the western portion of the facility, and received both runoff from the site and the effluent from the pipe curing operations (see Section 2.2). This water was recycled during normal plant operations. Other settling ponds are located east of the centrifugal line (P3 on Figure 4) and west of the centrifugal line (01 and 02 on Figure 4).

Samples of water and sediment were collected from these ponds. Analytical results of the sediment samples are summarized in Table 3; Table 4 presents the aqueous analytical results. The aqueous samples from the pond on the west side of the facility did not contain detectable amounts of volatile organic compounds (EPA Method 8240). The ponds adjacent to the centrifugal line also did not contain detectable amounts of volatile organic compounds, except for 2 ppb of toluene and 57 ppb of methylene chloride in one sample. However, sediment samples collected from the southern end of the pond on the west side of the facility contained elevated (greater than 1,000 ppm) concentrations of TPH (see Table 3, sample number PBSED2). More comprehensive sampling conducted in June 1990 included the collection of ten additional sediment samples, at depths of 6, 24, 36, and/or 42 inches at five locations. Concentrations of TPH for these samples were less than 500 ppm as measured by EPA Method 418.1. Moreover, the TPH concentration decreased with depth at four of the five sampling locations, and all of the samples collected below the 24-inch depth showed TPH concentrations less than 200 ppm.

4.8 Septic Tanks

Aqueous samples were collected from the septic tanks (cesspools) and analyzed for solvents and metals. The results indicated that the septic tanks probably received primarily domestic flows and not solvents or waste streams from the manufacturing process (see Table 4). One possible exception is the septic tank at the northwest corner of the main shop building, which contained low concentrations of benzene (2 ppb), toluene (30 ppb), and xylenes (80 ppb). Due to the age of the cesspools, little information is available on their design and construction. However, according to UCP personnel, it is likely that a leach field is associated with each cesspool. The tested cesspools are located within the manufacturing facility north of Live Oak Avenue and are in the City of Irwindale.

Underlying stratigraphy has been reported to consist primarily of sands and cobbles to depths explored. Under normal conditions, this would probably allow for the biological activity necessary for the leach field treatment concept to be viable. Groundwater is reported to occur at a depth of approximately 170 feet below the site. Therefore, it is unlikely that the groundwater quality is impacted by the effluent leaving the cesspools.

4.9 Waste Oil Sump - Area B

The waste oil sump area (Area B) consisted of a 500-gallon concrete sump piped to a 3,000-gallon steel storage tank. Part of this area was excavated and two samples were collected, at about 1 foot up from the bottom of the tank at both ends. The samples in the south and north ends at a depth of 10 feet showed 607 and 38 ppm of total petroleum hydrocarbons, respectively.

The waste oil sump area was excavated in March 1989, and the sump and tank, along with about 150 tons of affected soil, were removed and disposed of off site.

4.10 Evaluation of Hazardous Characteristics

Two soil samples from the pour line area (Area C) were evaluated to assess whether they were hazardous under the California Administrative Code, Title 22. These samples were collected from depths of 16 and 23 feet, respectively. These depths were chosen so that the characteristics of the petroleum hydrocarbons used as form oil in the past could be evaluated. The samples were analyzed for flammability (EPA Method 1010), pH (EPA Method 9045), volatile organics (EPA Method 8240) and semi-volatile organics (EPA Method 8270), and acute aquatic toxicity. Results are included in Appendix E. The material was found to have no detectable flash point. The material was not corrosive because pH of the material was between 8.74 and 9.13. Volatile organics quantified in the samples were toluene (0.05 ppm), ethylbenzene (0.03 ppm), and 1,1,1-tri- chloroethane (0.03 ppm). Acetone at 0.60 ppm was detected in one sample; the State-certified laboratory (CRL) stated that this was most likely attributable to laboratory contamination. No semi-volatile organic compounds were detected in the two soil samples analyzed. Furthermore, results indicated that the material is non-hazardous with respect to acute aquatic toxicity.

4.11 Summary of Site Investigation

The investigative program conducted by Woodward-Clyde evaluated the areas of potential environmental concern at the UCP manufacturing facility. Soil, sediment, or water samples from the pour line, waste oil sump, centrifugal line, and ponds contained elevated concentrations of organic compounds,

primarily petroleum hydrocarbons. A surface sample collected from the thinner storage area also contained elevated concentrations of petroleum hydrocarbons.

Soil at the pour line contained elevated concentrations (greater than 100 ppm) of C_8-C_{35} hydrocarbons at depths of up to 24 feet below the ground surface, along a length of approximately 400 feet and width of about 25 feet. Samples with elevated concentrations of hydrocarbons from the pour line area were non-hazardous waste per Title 22 of the California Administrative Code criteria.

In general, although the soil from specific areas of the site, most notably the pour line, contains elevated concentrations of hydrocarbons, it appears that the release of hydrocarbons in soil is limited to past site activities. No evidence of significant releases of solvents was uncovered by this investigation, although low concentrations of volatile organic hydrocarbons were found in the soil at some locations. The hydrocarbons present in the soil do not appear to pose a threat to public health and the environment.

5.0 ENVIRONMENTAL SETTING

The UCP pipe manufacturing facility is located on approximately 74 acres of land situated immediately southwest of the Santa Fe Dam and east of the San Gabriel River Channel. It is bounded on the south by Live Oak Avenue, and on the northeast by Arrow Highway. Ground surface elevations at the site range from approximately 410 to 425 feet mean sea level (MSL).

The facility is situated in the north-central area of the San Gabriel Valley Groundwater Basin, and overlies fresh-water-bearing deposits of that basin. The basin is an

elongated, alluvium-filled valley extending from the central part of Los Angeles County almost to its eastern boundary. The valley, which is approximately 14 miles wide, is bordered on the north by the San Gabriel Mountains and on the south by the Repetto, Puente, and San Jose hills. A topographic divide marks the eastern boundary of the basin, and the Raymond Fault serves as the northwestern boundary. The surface area of the valley floor is approximately 100,000 acres.

Average annual precipitation in the site vicinity is approximately 14 inches, although rainfall in the San Gabriel Mountains, to the north, exceeds 35 inches annually at the higher elevations. Because these mountains are composed primarily of non-water-bearing rock, local precipitation in the mountains runs off through San Gabriel Canyon, providing sources of recharge to the water-bearing deposits underlying the valley floor in the vicinity of the site. The region's groundwater gradient from the mouth of San Gabriel Canyon is to the south and west.

The principal drainage in the area is the San Gabriel River, located immediately west of the site. The river banks are lined with concrete; the river bottom consists of native alluvial sand and gravel deposits.

The surface deposits in the site area are recent alluvium deposited by the San Gabriel River. These deposits overlie older alluvium. The central portion of the San Gabriel Valley Groundwater Basin has water-bearing deposits averaging about 1,000 feet in thickness. The alluvium that comprises the water-bearing materials in the site vicinity consists of randomly sorted, subrounded to well-rounded, coarse-grained deposits derived from the San Gabriel Mountains to the north. The deposits range in size from silts to 4-foot-diameter

boulders. The alluvium generally consists of coarse sands and gravels, with occasional layers or lenses of finer-grained material deposited during low-flow cycles.

The coarseness of the sands and gravels in the alluvial deposits makes these deposits ideal aquifers. Horizontal permeabilities of these deposits range from about 100 to 500 gallons per day per square foot, although vertical permeabilities are generally an order of magnitude lower than the horizontal values. The existence of a perched water-bearing zone above the primary groundwater basin at the site is unlikely, due to the coarse-grained nature of the soil.

Groundwater levels in the vicinity of the site fluctuate greatly depending on the frequency and quantity of precipitation. A well installed at the UCP facility encountered water at approximately 170 feet below ground surface.

6.0 FACTORS RELATED TO KNOWN OR POTENTIAL SITE CONTAMINATION

6.1 Contaminant Characteristics

Results of the site investigation indicated that most of the chemicals present in the soil are a result of surface spillage from the manufacturing of concrete pipes, and seem to be confined to the top 1 foot of soil. Near the pour line, petroleum hydrocarbons (C_8-C_{35}) have migrated to a depth of up to 24 feet below the ground surface.

The hydrocarbons found at the pour line are likely form oil which was used as a release agent for concrete pipe forms. Mineral oil is generally a refined liquid petroleum product of moderate carbon chain length and high flash point. It contains easily biodegradable compounds.

According to its MSDS, mineral oil has negligible water solubility and no potential carcinogenic properties. This material thus has low potential to form leachate with infiltrating water. Analytical results indicate that the hydrocarbon-contaminated soil at the pour line would not be classified as a hazardous waste. In addition to the form oil, a small amount of hydraulic fluid is known or suspected to be present in the soil at some locations. According to the MSDS (Appendix B), the petroleum-base oil for the hydraulic fluid does not require a cancer warning, nor is it classified as a potential carcinogen to humans. Similar in overall nature to mineral oil, it has a high flash point and contains easily biodegradable compounds.

6.2 Critical Habitat, Sensitive Environment, and Endangered Species

Recent aerial photographs and the Baldwin Park 7.5-minute USGS topographic quadrangle indicate the nearest wetland area to be located directly across the Santa Fe Drain in the Santa Fe Flood Control Basin and Recreation Area. The 1956 and 1969 aerial photographs, however, do not indicate wetlands in this region. Other surrounding land uses within a 2-mile radius do not indicate wetland areas; these properties are primarily developed for industrial or residential use.

The nearest surface water recreational use area is located approximately 1/2 mile to the north, at the Santa Fe Dam Recreation Area, which is up gradient of the subject site.

Although no contaminants are expected to migrate off site, the California Fish and Game Natural Diversity Data Base (NDDB, 1989) was utilized to identify sensitive species within a 2-mile radius of the site. Sensitive species or ecosystems identified by the NDDB include:

- Western Yellow-Billed Cuckoo: The legal status of this species is defined as a Federal candidate 2 and California endangered species. The cuckoo was observed next to the San Gabriel River at El Monte, approximately 2 miles south of the site.

- Parish's Gooseberry: This species has no legal status, but it is noted by the NDDB as a sensitive species and was observed next to the San Gabriel River at El Monte, approximately 2 miles south of the site.

USGS topographic quadrangles do not indicate a critical habitat for sensitive, threatened, or endangered species within a 1-mile radius of the site. However, a recent aerial photograph and the USGS quadrangles indicate a freshwater wetland area located directly across the Santa Fe Drain in the Santa Fe Flood Control and Recreation Area.

The Baldwin Park and Azusa USGS topographic quadrangles do not indicate national/state parks, forests, wildlife reserves, or historic/landmark sites within 2 miles of the site. The USGS quadrangles and a recent aerial photograph do indicate a large residential area in the City of Baldwin Park located to the south and adjacent to the site, and another residential area approximately 1 mile northwest of the site in the City of Monrovia.

6.3 Exposure Routes and Toxicity

Under the existing condition, the major exposure route of the surface soil containing petroleum hydrocarbons to humans would be through inhalation and dermal contact of fugitive dust. The mechanism associated with this exposure route would be wind dispersion. Release of dust into the atmosphere would be intermittent on windy days. This release was mitigated at UCP by paving the facility and by use of water

sprinkler systems. Because of the semi-closure status and limited operations at the facility, exposure to humans through dermal contact would be minimal.

Occasionally, surface runoff that carries soil to the settling ponds may occur, particularly during heavy rains. Petroleum hydrocarbons may be released to the pond water. Petroleum hydrocarbons in the subsurface soil at the pour area may migrate vertically toward the groundwater. However, considering the low solubility of the hydrocarbons and the depth to the groundwater (approximately 170 feet), the potential for these hydrocarbons to impact the groundwater (and resultant health risks) would be insignificant.

The relative toxicity of mineral oil in soil via inhalation or dermal contact would be low. Mineral oil has an ACGIH TLV/TWA or OSHA PEL value of 5 mg/m^3 for oil mist. It does not contain carcinogens or potential carcinogens. No health or cleanup standards have been established for mineral oil.

In summary, based on the characteristics of mineral oil, the vertical extent of hydrocarbon-contaminated soil, and the depth to groundwater, it is concluded that the hydrocarbons present in the soil at the pour line do not pose a threat to public health and the environment. As a result, factors related to soil/direct contact pathways, and factors related to water and air pathways are not addressed in this PEA.

7.0 ANALYSIS OF PATHWAYS FOR HAZARD POTENTIAL DETERMINATION

The UCP manufacturing facility, in its present condition, does not pose a threat to public health and the environment. Operations at the facility have essentially ceased during the last 6 months. This would greatly reduce the potential for

exposure of onsite workers to dust. Proposed site development would include light industrial and office buildings and paved parking lots.

Release of hydrocarbon-contaminated soil at the facility may occur through air dispersion and surface runoff (to settling ponds on site) pathways. Release of mineral oil from soil to groundwater is essentially nil based on the site investigation findings and regional hydrogeologic setting.

7.1 Air Dispersion Pathway

Although almost the entire area of the facility is paved, inhalation and dermal contact of dust may occur, particularly on windy days. Potential dust release was mitigated by use of sprinkler systems when the facility was in operation. Fugitive dust may be released during demolition and construction for the proposed development. However, dust would be mitigated by daily watering the excavation area or the entire site, as needed. Once the site development is completed, the potential for exposure to dust through air dispersion would be eliminated.

7.2 Surface Runoff Pathway

Surface runoff was collected in settling ponds located on the western corner of the property. Analysis of water samples from these ponds did not detect volatile organic compounds. The sediment samples did not contain elevated concentrations of metals or volatile halocarbons. Thus, potential adverse impact on the environment and wildlife from surface runoff would be insignificant.

7.3 Groundwater Pathway

Given the depth to groundwater (approximately 170 feet), it is unlikely that the hydrocarbons present in the soil will

reach groundwater, considering that they have penetrated only a maximum of approximately 24 feet after three to five decades of movement. Groundwater samples from monitoring wells in the site vicinity (and the well on site) have shown no detectable hydrocarbon concentrations. Activities that historically released mineral oil to the soil have ceased, so no additional inputs will occur.

7.4 Fire and Explosion Hazards

The majority of the materials such as aggregates, cement, and steel used in the manufacturing of concrete pipes are inert. Further, the soil at the pour line has been shown to be nonflammable. Thus, no known fire or explosion hazards exist at the facility.

8.0 COMMUNITY ASSESSMENT

UCP has been at the same location conducting the same business for almost 53 years. Because there has been no reported release of hazardous substance and fuels and the facility has AQMD permits for dust emissions, no complaints have been filed at the regulatory agencies against UCP. The Los Angeles County Department of Health Services, Cities of Irwindale and Baldwin Park, and their fire departments have expressed no interest or concern regarding UCP. In fact, the City of Irwindale is encouraged by the proposed site development and is participating in this site development project.

9.0 CONCLUSIONS

Based on the data and information presented in this PEA, the following conclusions can be drawn:

- UCP has been operating at this site for almost 53 years and is in the process of closing down and selling the property.

- Past and present operations have resulted in the surface spillage of petroleum hydrocarbons at a few areas on site. However, the concentration levels of petroleum hydrocarbons (as measured by EPA Method 418.1) in soil are low (less than 1,000 ppm), except at the pour line.

- Mineral oil, a release agent for concrete pipe form, has penetrated to a depth of up to 24 feet below the ground surface at the pour line. It is improbable, however, that this form oil would migrate to the groundwater (which is estimated at 170 feet deep), because it has moved only about 25 feet over a period of 30 to 50 years, and the source has now been removed.

- The mineral oil has no carcinogenic properties. The soil containing mineral oil at the pour line is not a hazardous waste per Title 22 of the California Administrative Code. Public exposure to this material would be primarily through inhalation and dermal contact of dust on windy days.

- UCP has ceased its concrete pipe manufacturing activities. The facility is essentially closed, with structures, equipment, concrete pipes, and pavements to be dismantled and/or removed prior to site development. A small amount of steel fabrication was being conducted on site at the time of a site visit on 12 June 1990.

- The Koll Company plans to develop approximately 55 acres of the property. The City of Irwindale is purchasing the remaining 17 acres for a retail development. The Koll Company intends to install site improvements, including interior streets, sewers, water, utilities, storm drains, and perimeter and street frontage landscaping. By early 1991, The Koll Company will have divided the property into parcels of varying sizes for construction. The proposed construction would be light industrial and office buildings. Current development plans will result in the construction of roads and/or buildings in the areas currently occupied by the pond on the west side of the property and by the pour line.

10.0 REFERENCES

State of California, "Guidance for Preparation of a Preliminary Endangerment Assessment Report," prepared by Toxic Substances Control Program, Department of Health Services (Draft), 12 December 1989.

Woodward-Clyde Consultants, "Preliminary Site Assessment for United Concrete Pipe Manufacturing Facility Located at 14041 East Live Oak Avenue in Baldwin Park, California (Draft)," 16 December 1988.

Woodward-Clyde Consultants, "Phase 2 Site Assessment for United Concrete Pipe Manufacturing Facility Located at 14041 East Live Oak Avenue, Baldwin Park, California (Draft)," 7 February 1989.

Appendix C
Tank Removal Records

Part A	Tanks Overview
Part B	Centrifugal Building - Boiler Tanks
Part C	Garage Tanks
Part D	Garage Waste Oil Sump and 3,000 Gallon Tank

Part A

Tanks Overview

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

1540 ALCAZAR STREET
LOS ANGELES, CALIFORNIA 90033
Telephone: (213) 226-8111

THOMAS A. TIDEMANSON, Director
WYNN SMITH, Chief Deputy Director
CECIL BUGH, Assistant Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 4089
LOS ANGELES, CALIFORNIA 90051

December 14, 1987

IN REPLY PLEASE
REFER TO FILE: I-593-3S

Mr. Frederick Gobler
United Concrete Pipe
Division of U.S. Pipe & Foundary
P.O. Box 429
Baldwin Park, CA 91706

Dear Mr. Gobler:

HAZARDOUS MATERIALS UNDERGROUND STORAGE
APPLICATION FOR CLOSURE
FACILITY AT: 14041 Live Oak Ave.

Please find enclosed an Application for Closure forms per your request.

All existing underground tanks must be either closed or permitted. If the tanks are to be closed, complete the copy of the application form and return with the proper fee and required supporting information.

Soil sampling and analysis will be required for all closures. Soil borings will be required if the tank contained a volatile or semi-volatile priority pollutant, or an extremely hazardous material. A plot plan to scale showing location of tank(s), buildings, adjacent streets, north arrow and proposed soil sampling points must accompany the application forms.

If you have any questions concerning this matter, please contact Mr. Blair Burgess at (213) 226-4437.

Very truly yours,

T. A. TIDEMANSON
Director of Public Works

By _____
Waste Management Division

CL201 1/87

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

POST OFFICE BOX 3009, TERMINAL ANNEX
LOS ANGELES, CALIFORNIA 90051
574-0949

JOHN W. ENGLUND
FIRE CHIEF
FORESTER & FIRE WARDEN

UNITED CONCRETE PIPE
14041 E. LIVE OAK
BALDWIN PARK, CA 91706

ATTENTION MR. FRITZ GOBLER

DEAR MR. GOBLER:

In regards to your request in procedures for abandonment or removal of underground storage tanks; Our department recognizes both removal and abandoning in place. However, the Department of County Engineer must be contacted first and their requirements complied with prior to Fire Department involvement.

The following are required procedures for Underground Tank Abandonment in place:

1. Obtain a permit, through the local Fire Prevention Office, for Abandonment in place and contact the local Inspector at least 48 hours in advance of the abandoning date.
2. Remove all flammable or combustible liquid from the tank and from all connecting lines.
3. Disconnect the suction, inlet, gauge and vent lines.
4. Fill the tank and any remaining stubs completely with an approved non-shrinking inert solid material and cap all tank inlets and outlets.

If you have any questions regarding these procedures and requirements please feel free to contact me at my office.

Very Truely yours,

JOHN W. ENGLUND, FIRE CHIEF
LOS ANGELES COUNTY FIRE DEPARTMENT

By Michael Saenz
MICHAEL SAENZ, INSPECTOR
FIRE PREVENTION DIVISION

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

POST OFFICE BOX 3009. TERMINAL ANNEX
LOS ANGELES. CALIFORNIA 90051
574-0949

JOHN W. ENGLUND
FIRE CHIEF
FORESTER & FIRE WARDEN

JUNE 25, 1986

UNITED CONCRETE PIPE
DIVISION of U.S. PIPE
P.O. BOX 429
BALDWIN PARK, CA 91706

Attention Mr. Fritz Gabler P.E.

Dear Mr. Gabler:

In regards to the abandonment or removal of underground storage tanks. Our department recognizes both removal or abandoning in place. The Department of County Engineer must be contacted in either case and their requirments must be met prior to Fire Department involvement.

In the case of abandonment in place, as per your request, the following procedure is required by our department:

1. Remove all flammable or combustible liquid from the tank and from all connecting lines.

2. Disconnect the suction, inlet, gauge and vent lines.

3. Fill the tank and any remaining stubs completely with an approved non-shrinking inert solid material and cap all tank inlets and outlets.

Also a permit is required by this department and you must contact the local Fire Inspector at least 24 hours in advance of the date of abandonment.

If you have questions regarding this procedure, pleast feel free to contact me at my office.

Very truly yours,

JOHN W. ENGLUND, FIRE CHIEF
LOS ANGELES COUNTY FIRE DEPARTMENT

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

1540 ALCAZAR STREET
LOS ANGELES, CALIFORNIA 90033
Telephone: (213) 226-8111

THOMAS A. TIDEMANSON, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 4089
LOS ANGELES, CALIFORNIA 90051

December 3, 1987

IN REPLY PLEASE
REFER TO FILE
I-593-3S

Mr. Frederick Gobler
United Concrete Pipe
Division of U.S. Pipe & Foundary
P. O. BOX 429
Baldwin Park, CA 91706

Dear Mr. Gobler:

HAZARDOUS MATERIALS UNDERGROUND STORAGE PERMIT (HMUSP)
LEAK DETECTION PROGRAM/TANK MONITORING PROGRAM (LDP/TMP)
IMPLEMENTATION REPORT
HMUSP NO. 157
FACILITY LOCATION: 14041 East Live Oak Avenue, Irwindale

This office has reviewed the LDP/TMP implementation report submitted on October 27, 1986 for the subject facility.

[x] In order better evaluate the report, the information indicated on the attached Additional LDP/TMP Reporting Requirements sheet must be submitted to this office by January 4, 1988.

[ ] Based on the information submitted, the implementation of the LDP/TMP meets this office's requirements. Further reporting requirements will be outlined in the operational permit which will be forwarded to you at a subsequent date.

[ ] Other:

If you have any questions regarding this matter, please contact Mr. Blair Burgess at (213) 226-4437.

Very truly yours,

(818) 458-3507

T. A. TIDEMANSON
Director of Public Works

By
Waste Management Division

Enc.

cc: Hydrosolutions of California, Inc.

LD304 8/87

FILE # 593-3S
HMUSP # 157

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
ADDITIONAL LDP/TMP REQUIREMENTS

The additional information or requirements checked below must be submitted to the Los Angeles County Department of Public Works, Waste Management Division, P.O. Box 4089, Los Angeles, CA 90051, in order to complete evaluation of the LDP/TMP implementation report.

[ ] 1. Plot plan to scale showing locations of tanks and associated piping, boring and monitoring well locations, buildings, adjacent streets, and north arrow.

[ ] 2. Information pertaining to the tanks contradicts information previously submitted on the permit application form or hazardous substance storage statements. These contradictions must be corrected.

[ ] 3. Number and location of soil and/or groundwater samples is not adequate.

[ ] 4. Sampling protocol.

[ ] 5. Sample analysis method(s).

[ ] 6. Boring logs certified by a California registered geologist, California registered civil engineer with sufficient experience in soils, or a California certified engineering geologist.

[ ] 7. Documentation as to depth of groundwater at facility.

[ ] 8. Monitoring well specifications and cross section showing well construction.

[X] 9. Monitoring well specifications do not conform to Los Angeles County guidelines for the groundwater condition. Well heads must be installed to conform to Los Angeles County Guidelines.

[X] 10. Manufacturer and model number of monitoring sensor or device(s). (Certification of installation)

[ ] 11. Manufacturer and model number of pressure line monitoring system.

[ ] 12. Manufacturer and model number of overfill protection device.

[ ] 13. Tank integrity test results and data sheets.

[ ] 14. Manufacturer and model number of Tank Level Monitor (TLM) system.

[ ] 15. Details of inventory reconciliation or tank gauging procedures.

[X] 16. Other: Verify that the piping system for tank 4 is a suction system. A closure permit must be obtained for tank 8.

LD304A 8/87

PROVISIONAL
HAZARDOUS MATERIALS UNDERGROUND STORAGE PERMIT
COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
WASTE MANAGEMENT DIVISION
2250 ALCAZAR STREET
LOS ANGELES, CALIFORNIA 90033

PERMIT NO. 157

EXPIRATION DATE OCT 12 1987

PERMISSION IS HEREBY GRANTED UNDER LACC TITLE 11, DIVISION 4 TO:

[illegible] <<<<<<<< FILE NUMBER
[illegible] <<<<<<<< PERMITTEE
[illegible]
[illegible] <<<<<<<< FACILITY ADDRESS

TO STORE HAZARDOUS MATERIALS IN UNDERGROUND TANK(S) LOCATED AT THE FACILITY ABOVE.

NUMBER OF PERMITTED TANKS: 6

THIS PROVISIONAL PERMIT IS SUBJECT TO THE FOLLOWING REQUIREMENTS:

PART A — GENERAL CONDITIONS AND LIMITATIONS (ATTACHED).

PART B — AUTHORIZED HAZARDOUS MATERIAL STORAGE TANKS (ATTACHED).

PART C — SPECIFIC CONDITIONS AND LIMITATIONS:

1. THE PERMITTEE SHALL SUBMIT FOR APPROVAL AND IMPLEMENT A LEAK DETECTION PROGRAM (LDP) AND A TANK MONITORING PROGRAM (TMP) PREPARED IN ACCORDANCE WITH "UNDERGROUND STORAGE OF HAZARDOUS MATERIALS - GUIDELINES FOR EXISTING FACILITIES, OCTOBER 1986."

2. THE FOLLOWING TIME SCHEDULE SHALL APPLY TO SUBMITTALS REQUIRED BY THIS PROVISIONAL PERMIT:

   a. PERMIT FEE DUE BY (SEE INVOICE) To Be Billed

   b. TANK INTEGRITY TEST RESULTS DUE BY JUL 10 1987

   c. PROPOSALS FOR LDP AND TMP DUE BY JUL 10 1987

3. PERMIT EFFECTIVE DATE 3/1/85
   NOTE: THE EFFECTIVE DATE IS DETERMINED BY ORIGINAL DATE OF PERMIT APPLICATION.

PART D — SPECIAL CONDITIONS AND LIMITATIONS ATTACHED. YES [x] NO [ ]

This Provisional Permit is valid only for the continued operation of tanks providing suitable storage and expires six (6) months from the date of issue. Permittee has until the expiration date to complete an approved LDP and to install and be in compliance with an approved TMP. Upon full compliance with the approved LDP and TMP and all other conditions and limitations, this Provisional Permit will be replaced by a full term Operational Permit for the remainder of the unexpired five (5) year term from the effective date unless otherwise noted in Part D above.

T. A. TIDEMANSON
DIRECTOR OF PUBLIC WORKS

BY _____ APR 10 1987
WASTE MANAGEMENT DIVISION

APR 13 1987

HCL

PP801 10/86

HAZARDOUS MATERIALS UNDERGROUND STORAGE PERMIT

PART A — GENERAL CONDITIONS AND LIMITATIONS

TERM OF PERMIT

1. The combined provisional and full term operational permits shall be valid for a maximum period of five (5) years from the effective date. However, if the Department of Public Works (DPW) finds that the life expectancy of a facility is less than five (5) years, the DPW may adjust the term of the permit to reflect such a condition.

FEES

2. All fees shall be due and payable on the billing date established by the DPW. Fees not paid within 30 calendar days from the billing date shall be considered delinquent. Delinquent fees shall be subject to a 10 percent penalty fee for each 30 day period beyond the billing date that the fee is due. Permits for which the annual permit fee installment is delinquent for 90 days or more are subject to suspension.

REPORTS AND RECORDS

3. At least annually and due by the anniversary of the effective date of this permit, a written report must be submitted to the Department of Public Works, Waste Management Division, P.O. Box 4089 Terminal Annex, Los Angeles, CA 90051 detailing (but not limited to) the following:

   a. Any changes in the type of hazardous materials stored within the facility.

   b. Any changes in the uses of the underground facility.

   c. Changes or modifications to monitoring procedure.

   d. A detailed account of any unauthorized discharges, and the remedial measures employed.

   e. Any modifications to the facility except for routine required maintenance.

   In the event there has been no change of operation nor unauthorized release, a negative declaration to that effect may be submitted.

   The report or negative declaration shall be certified by the permittee or an authorized representative who is responsible for operations at the facility.

   This report is required by local agencies to satisfy Section 25286(c) of the State of California Health and Safety Code. A report form will be made available to owners and operators to comply with this requirement. The report shall be delinquent 30 days after its due date and as such may result in suspension or revocation of the permit.

4. Every permittee shall provide testing, monitoring (if applicable), and inspections in compliance with this permit and shall maintain records adequate to demonstrate compliance therewith.

5. All required records shall be maintained by the permittee and made available for inspection for a period of time not less than three (3) years from the date of the required annual report for the year during which the testing, monitoring or inspection was performed. Said records shall be made available to the DPW, County Health Officer or Forester and Fire Warden during normal working hours and at any time upon reasonable notice.

RENEWALS AND EXTENSIONS

6. If this is a provisional permit, it may be extended to a maximum of one (1) additional year upon written application stating the reasons for such a request and upon approval by the Director of Public Works.

7. Every application for the renewal of a operational permit or extension of a provisional permit shall be made at least 30 days prior to the expiration date of such permit. If a timely application for renewal has been submitted, the permit shall remain in effect until the DPW has made a decision and any administrative appeal has been exhausted.

APPEALS

8. Any person dissatisfied with the decision of the DPW may appeal the decision, in writing, to the Appeals Board, setting forth with particularity the ground or grounds for the appeal. Such appeal shall be submitted within 30 days after notice of the decision has been given.

ADDITIONAL APPROVALS AND REPAIRS

9. Additional approvals shall be required for any of the following actions:

   a. Tank repair.

   b. Modifications.

   c. Change or addition of hazardous materials stored.

   d. Change of approved monitoring system.

10. Procedures for an application for a permit shall also apply to an application for an additional approval. Each application for an additional approval shall be accompanied by the appropriate fee and supporting information.

11. Any substantial modification or repair of a facility other than minor repairs or emergency repairs shall be in accordance with plans to be submitted to the DPW as an additional approval.

12. Permittee shall carry out routine maintenance, ordinary upkeep and minor repairs in a careful and safe manner. No permit will be required for such maintenance, upkeep and repairs.

13. Permittee may make emergency repairs to a facility in advance of seeking an additional approval whenever an immediate repair is required to prevent or contain an unauthorized discharge or to protect the integrity of the containment. However, within five (5) working days after such emergency repairs have been started, permittee shall seek additional approval by submitting drawings or other information adequate to describe the repairs to the DPW.

CLOSURES, DECONTAMINATION AND NEW CONSTRUCTION

14. Replacement of tanks at an existing facility shall be considered a closure of the tanks to be replaced and a new installation of tanks, and all fees shall be assessed accordingly.

15. No tank shall be abandoned. Tanks which are temporarily out of service, and are intended to be returned to use, must continue to be monitored and inspected. Any tank which is not being monitored and inspected must be closed or removed in a manner approved by the DPW.

16. Prior to any permanent or temporary closures being initiated, an Application for Closure form, the appropriate fee and required supporting information shall be filed with the DPW.

17. Plans for the decontamination of a facility shall be submitted to the DPW for approval no later than 30 days before the commencement of such operations. Other agencies having jurisdiction shall also be notified. These agencies include the California Regional Water Quality Control Board, the Los Angeles County Department of Health Services and the South Coast Air Quality Management District.

18. The installation of a new tank shall require submittal to the DPW of an application for new construction, the appropriate new construction plan clearance fee and supporting information as required by the DPW.

TRANSFERS

19. A Hazardous Materials Underground Storage Permit may be transferred to a new owner of the same facility provided:

   a. The new owner accepts full responsibility for all obligations under this permit at the time of the transfer of the facility.

   b. The transfer shall be documented on a form provided by the DPW within 30 days of transfer of ownership.

   c. The appropriate fee is paid.

PART B — TANK DATA
HAZARDOUS MATERIALS UNDERGROUND STORAGE PERMIT NO. 157

AUTHORIZED HAZARDOUS MATERIAL STORAGE TANKS

TANK NUMBER	CAPACITY (GALLONS)	CONTENTS
BOILER — 3 - CLOSED	10,000	#2 Fuel Oil
*4 IN SERVICE	10,000	Unleaded Gasoline
[illegible] — 5 — CLOSED	10,000	Diesel
[illegible] — 6 — CLOSED	10,000	Gasoline
[illegible] — 7 - CLOSED	1,000	GASOLINE
(8) REMOVED	500	Waste Oil
*9 IN SERVICE	10,000 (dbl wall)	Diesel
[illegible] — 1 - CLOSED	10,000	DIESEL
[illegible] — 2 - CLOSED	"	"

* 4-12-90 - IVAN MURPHY U.C.P.

PERMIT # HMUSP 157 ← U.C.P. IS AWAITING THEIR COPY FROM

FILE # I-593-3S

L.A. COUNTY DEPARTMENT OF PUBLIC WORKS
WASTE MANAGEMENT DIVISION
P.O. BOX 1460
ALHAMBRA, CA.
91802-1460
(818) 458-3500

PP801B 10/86

PART D -- SPECIAL CONDITIONS AND LIMITATIONS
HAZARDOUS MATERIALS UNDERGROUND STORAGE PERMIT NO. 157

1. Permittee shall provide certification by an authorized independent technician that the monitoring system is installed and operational before the expiration of this Provisional Permit. The technician shall be certified by the manufacturer of the monitoring system to install, calibrate, service and inspect the monitoring system.

2. Monitoring system installation shall comply with all local fire, building, mechanical and electrical code and permit requirements.

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

1540 ALCAZAR STREET
LOS ANGELES, CALIFORNIA 90033
Telephone: (213) 225-5111

THOMAS A. TIDEMANSON, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 4089
LOS ANGELES, CALIFORNIA 90051

October 23, 1987

IN REPLY PLEASE
REFER TO FILE
I-593-3S

Mr. Frederick Gobler
United Concrete Pipe
Division of U.S. Pipe and Foundry
P.O. Box 429
Baldwin Park, CA 91706

Dear Mr. Gobler:

HAZARDOUS MATERIALS UNDERGROUND STORAGE PROGRAM (HMUSP)
LEAK DETECTION PROGRAM/TANK MONITORING PROGRAM (LDP/TMP)
HMUSP NO. 157
FACILITY LOCATION: 14041 East Live Oak Avenue, Irwindale

This office has reviewed the LDP/TMP proposal submitted on August 4, 1987 for the subject facility.

In order to comply with the County's minimum LDP/TMP requirements, the information indicated on the attached Additional LDP/TMP Requirements sheet must be submitted to this office by November 20, 1987.

If you have any questions regarding this matter, please contact Mr. Blair Burgess at (213) 226-4437.

Very truly yours,

T. A. TIDEMANSON
Director of Public Works

By _____
Waste Management Division

Enc.

cc: Hydrosolutions of California, Inc.

LD302 5/87

FILE # I-593-3S
HMUSP # 157

LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
ADDITIONAL LDP/TMP REQUIREMENTS

The additional information or requirements checked below must be submitted to the Los Angeles County Department of Public Works, Waste Management Division, P.O. Box 4089, Los Angeles, CA 90051, in order to complete evaluation of the LDP/TMP proposal.

[ ] 1. Plot plan to scale showing locations of tanks and associated piping, boring and monitoring well locations, buildings, adjacent streets, and north arrow.

[ ] 2. Information pertaining to the tanks contradicts information previously submitted on the permit application form or hazardous substance storage statements. These contradictions must be corrected.

[ ] 3. Number and location of soil and/or groundwater samples is not adequate.

[ ] 4. Proposed sampling protocol.

[ ] 5. Proposed sample analysis method(s).

[ ] 6. Boring logs certified by a California registered geologist, California registered civil engineer with sufficient experience in soils, or a California certified engineering geologist.

[ ] 7. Type of monitoring proposed is not appropriate for tank(s) number _____.

[ ] 8. Documentation as to depth of groundwater at facility.

[ ] 9. Monitoring well specifications and cross section showing well construction.

[ ] 10. Monitoring well specifications do not conform to Los Angeles County guidelines for the groundwater condition.

[ ] 11. Manufacturer and model number of monitoring sensor or device(s).

[ ] 12. Manufacturer and model number of pressure line monitoring system.

[X] 13. Manufacturer and model number of overfill protection device.

[ ] 14. Tank integrity test results and data sheets.

[ ] 15. Manufacturer and model number of Tank Level Monitor (TLM) system.

[ ] 16. Pressurized pipelines must be shown on the plot plan.

[ ] 17. Monitoring for pressurized pipelines is required.

[X] 18. Other: LDP/TMP for waste oil tank #8 is required

LD302 6/87

Part B

Centrifugal Building

10,000 gallon	Fuel oil/diesel
8,000 gallon	Fuel oil/diesel
8,000 gallon	Fuel oil/diesel

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

1540 ALCAZAR STREET
LOS ANGELES, CALIFORNIA 90033
Telephone: (213) 226-8111

THOMAS A. TIDEMANSON, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 4089
LOS ANGELES, CALIFORNIA 90051

February 1, 1988

IN REPLY PLEASE REFER TO FILE: I-593-3S

U.S. PIPE & FOUNDRY CO.
14041 E. LIVE OAK AVENUE
IRWINDALE, CA 91708

BOILER TANKS

HAZARDOUS MATERIALS UNDERGROUND STORAGE
CLOSURE PERMIT NO. 3361B
FACILITY LOCATION: 14041 E. LIVE OAK AVENUE

This office has reviewed the soil/groundwater assessment report submitted on NOV. 18, 1987 required as a part of the subject closure procedure. Based on the information submitted, we find that:

[x] The closure is final and no further action is required.

[ ] The soils removed during the tank excavation are unrestricted and may be used as backfill material. The closure is final and no further action is required.

[ ] Excavated soils may be a hazardous waste and are not suitable for fill material or disposal on-site. Contaminated soils must be manifested, transported and disposed of pursuant to Chapter 6.5, California Health and Safety Code, unless evidence is presented indicating that disposal is proper at a less restricted facility. Copies of completed manifests or other appropriate evidence indicating legal disposal shall be submitted to this office before this project can be considered closed.

[ ] The permanent closure of the tank(s) in place shall comply with requirements set by the local Fire Department. Verification must be submitted to this office indicating proper closure and completion of all work.

If you have any questions concerning this matter, please contact Ms. Nicole Long at (213) 226-4010.

Very truly yours,

T. A. TIDEMANSON
Director of Public Works

By Nicole Long
Waste Management Division

cc:

CL204 7/87

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

1540 ALCAZAR STREET
LOS ANGELES, CALIFORNIA 90033
Telephone: (213) 226-8111

THOMAS A. TIDEMANSON, Director
WYNN SMITH, Chief Deputy Director
CECIL BUGH, Assistant Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 4089
LOS ANGELES, CALIFORNIA 90051

IN REPLY PLEASE
REFER TO FILE I-593-3S

November 6, 1987

U.S. Pipe & Foundry Co.
14041 East Live Oak Avenue
Irwindale, CA 91708

Gentlemen:

HAZARDOUS MATERIAL UNDERGROUND STORAGE
CLOSURE/SITE ASSESSMENT REPORT
CLOSURE PERMIT NO. 3361B
FACILITY LOCATION: 14041 EAST LIVE OAK AVENUE

This office has reviewed the closure report submitted on October 30, 1987, for the subject facility.

In order to better evaluate the report, the information indicated on the attached Additional Closure Requirements sheet must be submitted to this office by December 4, 1987.

If you have any questions regarding this matter, please contact Mr. Martin Moreno at (213) 226-5930.

Very truly yours,

T. A. TIDEMANSON
Director of Public Works

By Martin Moreno
Waste Management Division

Enc.

cc: Western Environmental Services

CL207 3/87

NOV 13 1987

HCL

ADDITIONAL CLOSURE REQUIREMENTS

The additional information or requirements checked below must be submitted to the Los Angeles County Department of Public Works, Waste Management Division, P.O. Box 4089, Los Angeles, CA 90051, in order to complete the evaluation of Closure Permit No. 3361B.

[ ] Plot plan to scale showing locations of tanks, sampling points, buildings, adjatent streets and north arrow.

[ ] Insufficient number of samples were obtained. Additional samples required in accordance with attached Closure Permit Requirements.

[ ] Describe method of obtaining, handling, and/or transporting samples.

[ ] Indicate time and date samples were obtained.

[ ] Submit logs certified by a CA Registered Geologist, CA Certified Engineering Geologist, or CA Registered Civil Engineer with sufficient experience in soils for all borings.

[ ] Submit chain-of-custody documentation initiated by person obtaining sample through person at DOHS certified laboratory.

[X] Disposal destination of tanks and evidence of legal disposal.

[ ] Analysis results by a State certified laboratory shall be submitted on laboratory letterhead showing analysis date, methods of extraction and methods of analysis.

[ ] Documentation as to depth of groundwater at facility.

[ ] Manifests to document hazardous waste disposal of removed soil.

[ ] Signature on the report is required of CA Registered Geologist, CA Certified Engineering Geologist, or CA Registered Civil Engineer with sufficient experience in soils.

[ ] Define the vertical and lateral extent of contamination.

[ ] Propose a remedial action plan to mitigate contamination.

[X] Other Please include either the triple rinse or tank hazardous waste manifest.

CL207 3/87

SAMPLE COLLECTION AND REMOVAL OF UNDERGROUND STORAGE TANKS UNITED CONCRETE PIPE DIVISION 14041 EAST LIVE OAK AVENUE BALDWIN PARK, CALIFORNIA

Project No. 21213

Prepared for:
Rudy's Service Station Equipment Maint., Inc.
2017 Seaman Avenue
South El Monte, California 91733

Prepared by:
WESTERN ENVIROMENTAL SERVICES, INC.
2113 WEST SEVENTEENTH STREET
LONG BEACH, CALIFORNIA 90810

October 21, 1987

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3.0 Geology	2
4.0 Laboratory Analyses and Results	2
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6.0 Recommendations	3
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LIST OF FIGURES

Figure No.	Title
1	Site Plan

LIST OF TABLES

Table No.	Title
1	Summary of Underground Storage Tank Data
2	Summary of Soil Sampling

1.0 INTRODUCTION

1.1 PURPOSE OF SCOPE OF WORK

This report summarizes underground storage tank removals and soil sampling operations performed at United Concrete Pipe Division (United). The subject site is located at 14041 East Live Oak Avenue, Baldwin Park, Los Angeles County, California

The work accomplished under Los Angeles County Permit No. 3361-B, on October 14, 1987 consisted of the removal of three diesel fuel underground storage tanks, and collection and quantitative analyses of 6 soil samples, used to document subsurface soil conditions.

United engaged the services of Rudy's Service Station Equipment Maint., Inc. (Rudy's) to perform the excavation and removal of the underground storage tanks. Western Environmental Services (WES) was employed under verbal agreement by Rudy's to: 1) collect soil samples from beneath the bottom of each tank and 2) prepare this report on tank removal operations. Included herewith are discussions on field procedures, laboratory testing, and analytical results for soil samples recovered during the excavation and subsequent tank removals.

2.0 FIELD PROCEDURES

On October 14, 1987, under the supervision of Los Angeles County Fire Department, three underground diesel fuel storage tanks were removed and disposed of properly. The tank numbers, capacities and contents as determined by field personnel are summarized in Table 1.

TABLE 1
SUMMARY OF UNDERGROUND STORAGE TANKS DATA
UNITED CONCRETE

TANK NO.	CAPACITY (gals.)	CONTENTS
1	10,000	Diesel
2	8,000	Diesel
3	8,000	Diesel

Following the removal of the tanks, six soil samples (1A, 1B, 2A, 2B, 3A, 3B) were collected at a depth of two feet below tank bottom by a WES geologist. Sample locations are shown on Figure 1 - Site Plan.

The samples were recovered from the excavations using a back hoe and quickly placed by hand into four ounce glas sample jars, sealed with a teflon-lined lid, each sample within labeled and immediately stored on ice in an ice chest until transport to the laboratory. WES chain-of-custody procedures were followed to ensure the integrity of samples submitted for analyses.

3.0 GEOLOGY

The United site overlays alluvial sediments, gravels and cobbles interbedded with coarse grained sands of recent age. The elevation of the tank pit areas is approximately 400 feet above seal level; the surrounding topography slopes gently to the South. A review of California Department of Water Resources (DWR) records indicate the first principle aquifer beneath the site is greater than 100 feet below the surface; semi-perched zones may occur at shallower depths.

4.0 LABORATORY TESTING AND RESULTS

All samples were submitted for analyses to Chemical Research Laboratories, Stanton, California. Samples were tested for total recoverable hydrocarbons according to E.P.A. method 418.1. The sample is extracted using a horn-type sonicator and examined by infrared spectroscopy. Laboratory certificate and chain-of-custody records are included in Appendix A and B respectively.

Based on laboratory results for samples collected, it appears hydrocarbon leakage has occurred at the site. Sample reference numbers, locations and test results (in parts per million) are summarized in Table 2.

TABLE 2
SUMMARY OF SOIL SAMPLING
D&K CONCRETE

SAMPLE NO.	LOCATION	E.P.A. 418.1 (ppm)
1A	Southside of northern diesel tank	100
1B	Northside of northern diesel tank	ND(1)
2A	Southside of southeast diesel tank	15
2B	Northside of southeast diesel tank	140
3A	Southside of southwest diesel tank	ND(1)
3B	Northside of southwest diesel tank	6

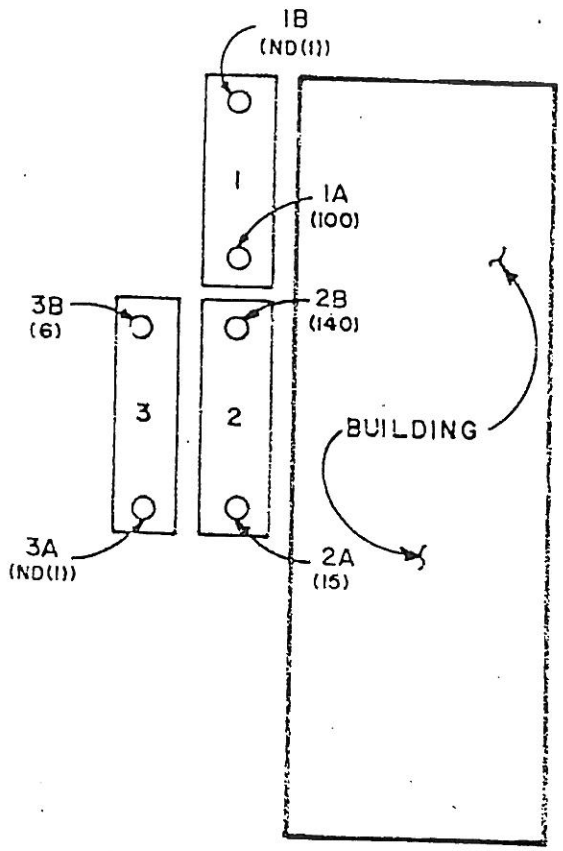
FIGURES

DRAWING NUMBER

CHECKED BY

APPROVED BY

DRAWN BY



LEGEND:

B1 ○ LOCATION OF SAMPLES COLLECTED OCT. 14, 1987

(100) CONCENTRATION OF TOTAL HYDROCARBON (PPM)

[1] TANK LOCATION

TANK DATA

NO.	DESCRIPTION
1	10,000 GALLON DIESEL
2	8,000 GALLON DIESEL
3	8,000 GALLON DIESEL

APPROX. SCALE

0 20 40 FT.

FIGURE 1

PARTIAL SITE PLAN AND SAMPLE LOCATIONS

UNITED CONCRETE PIPE
14041 EAST LIVE OAK AVE.
BALDWIN PARK CA. 91703
PREPARED FOR
RUDY'S SERVICE STATION
EQUIPMENT MAINT. INC.
2017 SEAMAN AVENUE
SO. EL MONTE, CA.

Chemical Research Laboratories, Inc.
SOUTHERN CALIFORNIA DIVISION
7440 Lincoln Way • Garden Grove, CA 92641
(714) 898-6370 • FAX: (714) 891-5917 • (800) LAB-1CRL

October 20, 1987

WESTERN ENVIRONMENTAL SERVICES
P.O. BOX 9806
LONG BEACH, CA 90810
ATTN: DAVID ARONNE

ANALYSIS NO.: 728703-001/006
ANALYSES: EPA METHOD 418.1
DATE SAMPLED: 10/14/87
DATE SAMPLE REC'D: 10/14/87
PROJECT: UNITED CONCRETE

Enclosed with this letter is the report on the chemical and physical analyses on the samples from ANALYSIS NO: 728703-001/006 shown above.

The samples were received by CRL in a chilled state, intact, and with the chain-of-custody record attached.

Please note that ND( ) means not detected at the detection limit expressed within the parentheses.

REVIEWED AND APPROVED

10/21/87
DATE

This report pertains only to the samples investigated and does not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the client to whom it is addressed. Any reproduction of this report or use of this Laboratory's name for advertising publicity purposes without authorization is prohibited.

CHEMICAL RESEARCH LABORATORIES, INC.

7440 LINCOLN WAY • GARDEN GROVE, CA 92641
(714) 898-6370 • (213) 598-0458

- ORANGE COUNTY
- VENTURA
- SANTA MARIA
- BAKERSFIELD
- L.A. COUNTY

CHAIN OF CUSTODY RECORD

Date 10-14-97 Page 1 of 1

CLIENT Western Environmental Services
ADDRESS P.O. Box 3 4906
Long Beach, Ca 90810

PROJECT MANAGER David Arnone
PHONE NUMBER 213-495-1334
SAMPLERS: (Signature) David Arnone

PROJECT NAME United Concrete

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
1A	Southside of Northern Oak desiel 2'B.G	10-14-97			✓		✓	✓	E.P.A 418.1
1B	Northside of Northern Oak desiel 2'B.G				✓		✓	✓	
2A	Southside of Eastern Ok desiel 2'B.G				✓		✓	✓	
2B	Northside of East Ok desiel 2'B.G.				✓		✓	✓	
3A	Southside of West Ok desiel 2'B.G.				✓		✓	✓	
3B	Northside of East Ok desiel 2'B.G.				✓		✓	✓	

		Date/Time
Relinquished by: (Signature) David Arnone Western Environmental Services Inc 10-14-97	Received by: (Signature)	
Relinquished by: (Signature)	Received by: (Signature)	
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	
Dispatched by: (Signature)	Received for Laboratory by:	10/14 19:00
Method of Shipment:		

Special Instructions: 48 hour basis NLT Friday P.M.

SOURCE Adapted from U.S. EPA, 1985

AMERICAN FUEL TANK METAL RECYCLING, INC.

2202 South Milliken Avenue
Ontario, CA 91761
(714) 947-2888

No. 00331

TANK DISPOSAL FORM

Date: 10-12 ,19 87
Job #
P.O. #

CONTRACTOR: Rudy's Service
ADDRESS: 2017 Seaman Ave. S. El Monte, Ca, 91733
JOB SITE: United Concrete Pipe
ADDRESS: 14041 E. Live Oak Blvd Baldwin Park
DESTINATION: A.M.R. 2202 S. Milliken Ave., Ontario, CA 91761

DATE	TIME	PROJECTED TANKS	ORDERED BY:	LIC NO.
10-14-87	12:30	3-10,000 ~~From 6500~~		~~#1~~

SPECIAL INSTRUCTIONS:

THIRD TANK 8000
HAD A 5' MANWAY ON IT
WE HAD TO RENT A Special
TRAILER TO TRANSPORT

COMMODITY (SPECIFY)

✓	Services Rendered	Cost
___	Disposal Fee	100.00
___	Extensive Loading Time	150.00
___	Disposal Fee with Permit	250.00
___	Fiberglass Tank Disposal Fee Per Tank	200.00
___	Cancellation Fee	250.00
✓	Other Specify Special Fee	
	TOTAL CHARGES	$ 250.00

All fees incurred are per load unless specified. Terms are net 30 days from date of invoice.

TANKS RECEIVED

QTY.	GALLONS	TYPE F* S*	NET TONS	TOTAL
___	280	☐ ☐	.15	
___	500	☐ ☐	.22	
___	550	☐ ☐	.25	
___	1000 - 12ft.	☐ ☐	.46	
___	1000 - 6ft.	☐ ☐	.63	
___	1500	☐ ☐	.90	
___	2000	☐ ☐	1.00	
___	2500	☐ ☐	1.18	
___	3000	☐ ☐	1.36	
___	4000	☐ ☐	1.70	
___	5000	☐ ☐	2.50	
___	6000	☐ ☐	2.92	
___	7500	☐ ☐	3.36	
1	8000	☐ ☐	3.55	3.55
___	9000	☐ ☐	3.94	
___	10000	☐ ☐	4.47	

NO. OF TANKS: 1 TOTAL NET TONS: 3.55

*F = FIBERGLASS *S = STEEL 105

CERTIFICATE OF TANK DISPOSAL/DESTRUCTION
THIS IS TO CERTIFY THE RECEIPT AND ACCEPTANCE OF THE TANK(S) AS SPECIFIED ABOVE. ALL MATERIALS SPECIFIED HAVE BEEN COMPLETELY DESTROYED FOR SCRAP PURPOSES ONLY.

M. Gomez
AUTHORIZED REP.

GENERATOR COPY

10-14-87.
DATE

RWQCB Records

Appendix G

California R gional Water Quality ontrol Board
Los Angeles Region

Winston H. Hickox
Secretary for
Environmental
Protection

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640
Internet Address: http://www.swrcb.ca.gov/~rwqcb4

Gray Davis
Governor

May 25, 2000

Mr. Skip Wohl
Wohl Property Group
30200 Rancho Viejo Road, Suite C
San Juan Capistrano, CA 92675-1560

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
CLAIM NO. Z 415 802 809

UNDERGROUND STORAGE TANKS PROGRAM –
METHYL TERTIARY BUTYL ETHER (MTBE) TESTING REQUIREMENT
FORMER UNITED CONCRETE PIPE
14041 EAST LIVE OAK AVENUE, IRWINDALE (FILE NO. I-00593A)

Dear Mr. Wohl:

Pursuant to Senate Bill 521 and Section 25299.37.1 of Chapter 6.75 of Division 20 of the California Health and Safety Code, testing for MTBE has been required at all underground storage tank sites since October 1997.

We have reviewed our case file regarding the subject site and find that previous soil investigations do not contain laboratory analytical test results for MTBE or other fuel oxygenates. Therefore, you are required to provide representative MTBE and other fuel oxygenates data for soils at the subject site.

At least one soil test boring is to be completed at the center of each soil contamination plume and/or release area (i.e., dispenser island area, underground storage tank area, and/or along pipelines). Soil borings at each location shall extend vertically downward until at least thirty feet of clean soils are demonstrated without any gasoline constituents (TPH_G, BTEX, MTBE or other fuel oxygenates), detected. Soil test borings shall not be drilled into groundwater at the site. If groundwater impacts are anticipated, then groundwater-monitoring wells are required to determine impacts to groundwater quality.

Soil samples shall be collected at 5-foot intervals in all borings for lithological soil description and chemical analyses by EPA Method 8015 for TPH_G and by EPA Method 8260B for benzene, toluene, ethylbenzene, xylene (BTEX) and fuel oxygenate compounds including MTBE, di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), and tertiary butyl alcohol (TBA). All analytical data must be reported by a California-certified laboratory.

In order to expedite the investigation, a workplan is not needed to conduct the limited soil investigation. However, if the results of the investigation do not define the full extent of the soil contamination, or if there are potential groundwater impact, then a workplan to install groundwater-monitoring wells is required to be submitted with your technical report, containing the results of this investigation.

A Health and Safety Plan shall be prepared, made available to field personnel, and implemented while conducting the fieldwork. All work must be performed by or under the direction of the registered geologists or registered civil engineer. A statement is required in the report that the registered professionals in responsible charge actually supervised or personally conducted all the work associated with the project. All reports submitted to this office must conform to the "Guidelines for Report Submittals - Revised June 1993" published by the Los Angeles County Department of Public Works (copy enclosed).

Pursuant to Section 13267 of the California Water Code, you are hereby required to submit a technical report containing the results of the soil investigation by **July 15, 2000**. As indicated above, if the results of this investigation indicate that the full extent of soil contamination is not defined, then a workplan for supplemental soil and/or groundwater characterization is required to be submitted with your technical report due by **July 15, 2000**. Failure to comply with the due date may result in an enforcement action by the Regional Board of up to $1,000.00 per day for each day the report is not received. The Regional Board can assess these civil liabilities at any time after **July 15, 2000.**

Please notify us at least seven days prior to the date that you plan to commence site assessment activities. If you have any additional questions additional concerning soil testing and/or reporting requirements please contact Mr. John Chiang at (213) 576-6708 or me at (213) 576-6702.

Sincerely,

Gregg Kwey
Senior Water Resource Control Engineer

Enclosure: Guidelines for Report Submittal

cc: Mr. Jorge Leon, State Water Resources Control Board, Office of Chief Counsel

Converse Consultants

Over 50 Years of Dedication In Geotechnical Engineering and Environmental Sciences

Phase II Environmental Site Assessment

Approximate 17 Acre Lot
Located at Live Oak Avenue and Arrow Highway
APN 8535-001-911
Irwindale, California 91706

CONVERSE Project No. 09-42-138-02

February 25, 2010

Prepared For:

City of Irwindale
Housing Department
5050 North Irwindale Avenue
Irwindale, California 91706

Prepared By:

CONVERSE CONSULTANTS
185 East Paularino Avenue, Suite B
Costa Mesa, California 92626

Converse Consultants

Over 50 Years of Dedication in Geotechnical Engineering and Environmental Sciences

February 25, 2010

Mr. Jose Amador
City of Irwindale
Housing Department
5050 North Irwindale Avenue
Irwindale, California 91706

Subject: **PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT**
17 Acre Lot Located at Live Oak Avenue and Arrow Highway
APN 8535-001-911
Irwindale, California 91706
Converse Project No. 09-42-138-02

Mr. Amador:

Converse Consultants (Converse) is pleased to submit the attached report that summarizes the activities and the results of a *Phase II Environmental Site Assessment* (Phase II ESA) that was conducted at the referenced Site (Site).

We appreciate the opportunity to be of service. Should you have any questions or comments regarding this report, please contact William Ragsdale or Laura Tanaka at (714) 444-9660.

CONVERSE CONSULTANTS

William Ragsdale
Project Environmental Scientist

Laura Tanaka, CSST #94-1388
Principal Environmental Scientist

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APPENDICES

Appendix A Soil & Soil Vapor Analytical Report & Chain of Custody Documentation
Appendix B Boring Logs
Appendix C Asbestos Analytical Report & Chain of Custody Documentation

1.0 Introduction

1.1 Background

Between June and November 2009, Converse completed a Phase I ESA for the referenced 17 acre, triangular-shaped vacant lot (Site) located west of the intersection of Live Oak Avenue and Arrow Highway in the City of Irwindale (Converse Project No. 09-42-138-01; Final Report Issued on November 3, 2009). The location of the Site is indicated on Figure 1. At that time, the Site was surrounded by chain-link fencing, and trees and shrubs lined the western and southern boundaries. A Los Angeles Department of Water and Power easement (powerlines) and concrete enclosure with electrical meters was located on the southern portion of the Site. See Figure 2, Property Plan, for details of observed features onsite.

Based on the information obtained during the Phase I ESA, the Site historically appeared to be undeveloped land as early as 1928-29. By 1936, the Site appeared to be developed as a portion of a larger industrial facility known as the United Concrete Pipe Corporation (UCPC) until 1990. The Site appears to have remained largely vacant since 1991.

Based on the information obtained during the Phase I ESA, UCPC was located at 14041 Live Oak Avenue was identified on several regulatory databases, including the California Environmental Protection Agency (Cal/EPA) ENVIROSTOR database, where in 1990 “No Further Action” was reported by the Department of Toxic Substances Control (DTSC). In addition, the larger UCPC facility reportedly had seven (7) underground storage tanks (USTs) installed onsite in 1974.

It appeared that three (3) of the seven (7) USTs were located on the Site that was being assessed by Converse for the City of Irwindale. According to agency records, one 8,000-gallon and two (2) 10,000-gallon USTs were located west of the former centrifugal area (north-central portion of the Site) and were removed in October 1987. The Los Angeles County, Department of Public Works (DPW) granted closure to the case in 1988. However, according to a May 25, 2000 Regional Water Quality Control Board (RWQCB) letter, the previous UST removals and closures at the UCPC facility did not include testing for methyl tertiary butyl ether (MTBE). Records of such testing were not found in the RWQCB file or any other agency records. In addition, sampling activities pertaining to the Site area of UCPC did not include the laboratory analysis for volatile organic compounds (VOCs) in soil or any soil vapor assessment.

Based on the findings of our Phase I ESA, further assessment appeared warranted and Converse recommended the following:

- Phase II assessment activities to assess historic features associated with the former UCPC facility. The Phase II activities should include soil sampling at a minimum for MTBE, and a soil vapor survey.
- Phase II activities should also include assessment in the general area of the current observed AST and associated pump feature.
- Roofing debris material should be analyzed for asbestos prior to disposal.

1.2 Field Variances

Variances from Converse's December 2, 2009 proposal included the following:

- Due to Site conditions, only the shallow soil vapor sample was collected at location GP1 due to refusals.
- Due to the discolored soil and odors observed in the sample from boring location GP9, a soil vapor sample was collected from 10 feet below ground surface (bgs) and analyzed for VOCs.
- Due to noted odors in samples from location GP9C, an additional step-out boring was added and identified as location GP9G.

1.3 Reliance

This report is for the sole benefit and exclusive use of the City of Irwindale in accordance with the terms and conditions attached to our proposal under which these services have been provided. Its preparation has been in accordance with generally accepted environmental practices. No other warranty, either express or implied, is made. This report should not be regarded as a guarantee that no further contamination beyond that which could be detected within the scope of this assessment is present at the Site.

The conclusions and recommendations presented in this report are based on the agreed upon scope of work. Converse makes no warranties or guarantees as to the accuracy or completeness of information provided or compiled by others. It is possible that information exists beyond the scope of this assessment. It is not possible to absolutely confirm that no hazardous materials and/or substances exist at the Site. If none are identified as part of a limited scope of work, such a conclusion should not be construed as a guaranteed absence of such materials, but merely the results of the evaluation. Also, events may occur after the Site visit, which may result in contamination of the Site. Additional information, which was not found or available to Converse at the time of report preparation, may result in a modification of the conclusions and recommendations presented. Any reliance on this report by Third Parties shall be at the Third Party's sole risk.

2.0 Scope of Services

2.1 Objective

The objective of this assessment was to screen the Site for subsurface contamination from historical uses identified in the previous Phase I ESA.

2.2 Project Set-up

Converse personnel coordinated and scheduled Site access with the City of Irwindale. The work area was marked and Underground Service Alert (USA) was notified.

2.3 Field Activities

2.3.1 Utility Clearance and Notifications

The Site was marked and USA was notified.

2.3.2 Soil Sampling Methodologies

On December 17 and 18, 2009, soil samples were collected using a direct-push (Geoprobe) drill rig at 10 locations (GP1 through GP10) to a maximum depth of 15 feet bgs. Upon review of the reported analytical results for samples analyzed from locations GP1 through GP10, Converse recommended that additional step-out borings be completed around locations GP8 and GP9. The additional step-out sampling was completed on February 4 and 15, 2010.

All soil samples were collected in 1-inch diameter acetate sleeves, which were driven to the appropriate sample depth. The sleeves with the soil samples were retrieved from the borings and cut at appropriate sample intervals. A subsample was collected from the sleeves of initial soil borings GP1 through GP10 in accordance with Environmental Protection Agency (EPA) Method 5035 using encore samplers for the potential analysis of VOCs. A portion of each soil sample was also placed in a sealable plastic bag and screened for VOCs using a photo-ionization detector (PID). The sample sleeves were then capped, labeled and placed on ice for transport, under chain of custody documentation to a State of California certified laboratory.

2.3.3 Soil Vapor Sampling Methodologies

Upon completion of the soil sampling, the Geoprobe-advanced borings were then utilized to install temporary soil vapor implants. Implants were set at 5 and 10 feet bgs at boring locations GP3, GP6, GP7, GP8 and GP10, and at 5 feet bgs at boring location GP1 and 10 feet bgs at GP9. On December 18 2009, soil vapor samples were collected from the probes set at locations GP1, GP3, GP6, GP7, GP8, GP9 and GP10.

On February 4 and 15, 2010, step out soil samples were collected from locations GP8A, GP8B, GP8C and GP9A through GP9G. Upon completion of the soil sampling, the Geoprobe-advanced borings were then utilized to install temporary soil vapor implants. Implants were set at 5, 10 and 20 feet bgs at boring locations GP8A through GP8C and GP9A through GP9F unless refusal, then the probes was set at a shallower depth, See Table 1, Summary of Soil Samples Analytical Results, for exact depths.

Prior to installing the soil vapor probes a bentonite seal was placed at the bottom of the boreholes. A 9-inch long porous probe, connected to polypropylene tubing, was then inserted into the borehole at the appropriate depth. An approximate 1-foot sand pack was then placed around and slightly above the probe. The boreholes were then backfilled with hydrated granular bentonite to the next sampling depth and the next probe was installed. Upon installation of the final probe, the boreholes were sealed up to ground surface with bentonite.

The subsurface conditions were allowed to equilibrate for a minimum period of 30 minutes following the probe installation. Following equilibration, the probes were then purged and sampled in general accordance with the Joint Department of Toxic Substances Control (DTSC)/Regional Water Quality Control Board (RWQCB) Advisory for Active Soil Gas Investigations, dated January 28, 2003. The volume of the sampling train was calculated and a default purge volume of 3 volumes was used.

The initial 12 soil vapor samples collected during the December 18, 2009 sampling event were collected in laboratory provided summa canisters, transported under chain of custody, and submitted to a State of California certified fixed laboratory for analysis of VOCs in accordance with EPA Test Method TO-15. Soil vapor samples collected from step-out locations during the February 4 and 15, 2010 sampling events were collected in a glass syringe and analyzed on site by a mobile laboratory for VOCs in accordance with EPA Test Method 8260. Confirmatory samples were also collected during the step-out sampling event in summa canisters and

analyzed in accordance with EPA Test Method TO-15. A total of 35 soil vapor samples were analyzed, including duplicates.

2.3.4 Asbestos

A debris pile was observed near the entry to the Site, which contained four different suspect asbestos-containing materials (ACMs):

- Roofing felt - large rocks
- Roof felt – “sand” type
- Roofing felt – small rocks
- Stucco

Bulk samples of the suspect materials were collected using a hand tool (pliers) and were placed in individual 4-mil poly bags. The bags were sealed and labeled for delivery to a certified laboratory.

2.3.5 Summary of Field Activities

A total of 77 soil samples and 49 soil vapor samples were collected from 20 locations at the Site. Sample locations are indicated on Figure 3, Boring Location Map.

- Soil samples from all 10 initial locations (GP1 through GP10) were collected from depths of 1, 5, 10 and 15 feet bgs.
- Soil samples from all 10 step-out locations (GP8A through GP8C and GP9A through GP9G) locations were collected from depths of 1, 5, 10, 15 and 20 feet bgs unless otherwise noted on the tables due to refusal. Due to refusal encountered in the initial boring at location GP9C at a depth of 10 feet bgs, a co-located boring was completed approximately 10 feet away to achieve a depth of 20 feet bgs.
- Soil vapor samples were collected from 5 and 10 feet bgs from locations GP3, GP6, GP7, GP8, and GP10. Soil vapor samples were collected from only 5 feet bgs at GP1 due to refusal, and from 10 feet bgs only due to stained soil observed at GP9.
- Additional soil vapor samples were collected from 5, 10 and 20 feet bgs from step-out boring locations GP8A through GP8C, and GP9A through GP9F, unless otherwise noted on table due to refusal.
- The bulk samples of the suspect ACMs were collected from a debris pile that measured approximately 4-feet high by 8-feet long by 4-feet wide. The major portion of the debris pile consisted of the roofing materials.

All soil samples were submitted to American Environmental Testing Laboratories (AETL) in Burbank, California. Initial soil vapor samples from the December 2090 event were submitted to Air Toxics Limited in Folsom, California. All other soil vapor samples from the February 2010 event were analyzed by Jones Environmental. All laboratories are certified by the State of California as environmental testing laboratories.

The bulk asbestos samples were submitted to the Converse asbestos laboratory located in Reno, Nevada.

2.4 Analytical

Selected soil samples from the December 2009 event at locations GP1 through GP10 were analyzed in accordance with one or more of the following EPA Test Methods:

- 8015 for Carbon Chain
- 6010 for metals
- 8260 for VOCs, and
- 8270 for Semi-volatile Organic Compounds (SVOCs).

Selected soil samples collected during the February 2010 event at locations GP8A through GP8C and GP9A through GP9G were analyzed in accordance with EPA Test Methods 8015 for Carbon Chain or 8270 for SVOCs.

Soil vapor samples collected from locations GP1, GP3, GP6, GP7, GP8, GP9 and GP10 were collected in summa canisters and were analyzed in accordance with EPA Test Method TO15 for VOCs only. During the February 2010 event soil vapor probes from step-out locations GP8A through GP8C and GP9A through GP9F were sampled and analyzed onsite in a mobile laboratory for VOCs in accordance with EPA Method 8260. This analytical method identified potentially low concentrations of certain chemicals as Tentatively Identified Compounds (TICs). Therefore, additional samples were collected from select probes in summa canisters and analyzed in accordance with EPA Test Method TO15, which has lower detection limits, to further assess the TICs.

3.0 Summary of Findings

3.1 Soil Conditions

The soils observed at ground surface and in the subsurface samples collected were generally silty sands with gravel in the upper portions of the borings and sands to sandy gravel in the lower portions of the borings. The soil samples were generally gray in color and slightly moist to dry.

The sand layer between 5 and 10 feet bgs at location GP9 was observed to differ from other sand layers and was noted as possibly being fill material. The soil sample from 15 feet at this location was noted to have a petroleum or solvent odor.

See Appendix B, Boring Logs, for complete descriptions.

3.2 Groundwater

Groundwater was not encountered in any of the boring completed to depths up to 20 feet bgs. Therefore, no groundwater samples were collected.

The depth to water in the onsite well was measured to be approximately 230 feet bgs.

3.2 Analytical Results

A summary of the analytical results are provided below. The analytical reports and chain of custody documentation are provided in Appendix A.

3.2.1 Soil Vapor

A total of 14 VOCs were reported during this assessment. Detected concentrations of VOCs reported in soil vapor included the following:

VOC	Number of Detections	Maximum concentration (ug/m^3)
Acetone	3	600
Benzene	1	241
2- butanone (MEK)	6	486
1,3-butadiene	2	170
Carbon disulfide	3	1100
Chlorobenzene	1	618
Ethanol	1	180

VOC	Number of Detections	Maximum concentration (ug/m^3)
Ethylbenzene	3	427
Heptane	1	94
Hexane	1	253
Styrene	25	755
Tetrachloroethene (PCE)	1	150
Toluene	24	550
Xylenes	13	714

See Table 1, Summary of Soil Vapor Sample Analytical Results, and Appendix A for the complete analytical results.

The evaluation of VOCs in soil vapor was initially based upon a comparison of reported concentrations for this assessment to California Human Health Screening Levels (CHHSLs) for shallow soil gas for either residential or commercial land use. Currently, CHHSLs are only established for four of the 14 detected VOCs. The detected VOCs for which CHHSLs are currently established, along with the maximum reported concentrations, are presented in the table below:

VOC	CHHSL - Shallow Soil Gas Screening Levels		Maximum Concentration
	Residential	Commercial	
	ug/m^3	ug/m^3	ug/m^3
Benzene	36.2	122	241
PCE	180	603	150
Toluene	135,000	378,000	550
Xylenes	319,000	887,000	714

The maximum reported concentrations of PCE, toluene and xylenes reported in samples from this assessment were below their respective residential CHHSLs. Benzene was reported at a concentration of 241 ug/m^3 in the sample from location GP9C at 10 feet bgs, which exceeds the CHHSL for commercial land use of 122 ug/m^3. No concentrations of benzene were reported in any of the other samples analyzed as part of this assessment.

For those VOCs detected that CHHSLs have not been established, a qualitative evaluation was made by comparing the reported soil vapor concentrations to EPA Regional Screening Levels (RSLs) for indoor air. For compounds that have both, it is noted that RSLs for indoor air are generally hundreds of times lower than CHHSLs for shallow soil gas, and this is due to only a small fraction of the concentrations in soil are anticipated to potentially infiltrate up through the floor slab and into a buildings interior. Therefore, if a concentration in soil vapor is less than the corresponding RSL for indoor air, it is unlikely that the reported concentration would pose a significant risk to future Site occupants.

The RSLs which are currently established for the eight VOCs detected which do not currently have CHHSLs established, along with the maximum reported concentrations are presented below. It is noted that either RSLs or CHHSLs are currently established for Ethanol or Heptane.

	RSLs – Indoor Air Screening Levels		Maximum Concentration
	Residential	Commercial	
	ug/m^3	ug/m^3	ug/m^3
Acetone	32,000	140,000	600
1,3-Butadiene	0.081	0.41	170
2-Butanone (MEK)	5,200	22,000	100
Carbon Disulfide	730	3,100	1,100
Chlorobenzene	52	220	618
Ethylbenzene	0.97	4.9	427
Hexane	750	3,100	253
Styrene	1,000	4,400	56

The maximum reported concentrations of all compounds are less than their respective commercial RSLs for indoor air with the following exceptions: 1,3-Butadiene, Chlorobenzene, and Ethylbenzene. Based on the limited number of detections of each of these three compounds (2, 1, and 3, respectively) and their concentrations in soil vapor relative to their respective indoor air screening levels, these compounds are not considered to pose a significant risk.

3.2.2 Soil

The analytical results reported no detectable concentrations of Total Petroleum Hydrocarbons (TPH) in the gasoline range above the method detection limits (MDL) in any of the soil samples analyzed.

The analytical results reported detectable concentrations of TPH in the diesel, and oil range above MDL in 8 of the soil samples analyzed with a maximum reported concentration of 4,150 milligrams per kilogram (mg/kg) in the diesel range and 29,500 mg/kg in the oil range. Both were reported in the sample from GP9C at 10 feet bgs. These concentrations are less than the California Regional Water Quality Control Board (CRWQCB) Maximum Soil Screening Levels (MSSLs) of 10,000 and 50,000 mg/kg for diesel and oil range hydrocarbons, respectively, based on a depth to groundwater of 230 feet bgs, which are established to be protective of groundwater.

See Table 2 for a complete summary of the soil analytical results for TPH.

Concentrations of benzene, toluene and m,p xylenes at 1.66, 3.29, and 3.65 micrograms per kilogram (ug/kg), respectively, were reported in sample GP9A at 5 feet bgs, and m,p xylenes were reported at 2.45 ug/kg in the sample from GP9A at 10 feet bgs. All other samples analyzed had no detectable

concentrations of VOCs above the MDLs. The reported concentrations of toluene and m,p xylenes are all below their respective health-risk based RSLs for residential and industrial soil (RSL-i and RSL-r, respectively) established by the EPA, as well as their respective MSSLs. The reported concentration of benzene exceeds the RSL-r of 1.1 ug/kg, but is less than the RSL-i of 5.6 ug/kg. The one reported benzene concentration is also less than the MSSL value of 44 ug/kg.

A single detection of one SVOC was reported in the soil samples analyzed. Bis (2-ethylhexyl) phthalate was reported with a concentration of 2.69 mg/kg. The reported concentration is below the RSL-r of 35 mg/kg.

3.2.3 Metals

Twelve metals were reported in the soil samples analyzed at the following maximum concentrations:

Metal	Maximum Concentration (mg/kg)	Number of Detections
Antimony	1.35	2
Arsenic	2.2	6
Barium	119	20
Cadmium	1.35	2
Chromium (total)	14.2	19
Cobalt	9.3	19
Copper	19.1	18
Lead	14.2	6
Mercury	0.209	2
Nickel	12.9	19
Vanadium	39	20
Zinc	85.8	20

All reported metals are below their respective RSL-r and CHHSLs-r values, with the exception of arsenic. Concentrations of arsenic in all samples exceeded the CHHSL-r of 0.07 mg/kg and the RSL-r of 0.39 mg/kg. However, the reported concentrations in all samples analyzed at the Site do not exceed the Department of Toxic Substance (DTSC) screening level for arsenic at school sites of 12.0 mg/kg, which is considered to be a general background concentration.

See Table 3 for a complete summary of the analytical results for metals.

3.2.4 Asbestos

A description of the suspect ACMs sampled and the reported results are as follows:

Suspect Material	% Asbestos Detected	Comments
Roofing felt, large rocks	None Detected	The debris pile measured approximately 4-feet x 8-feet x 4-feet.
Roofing felt, “sand” type	None Detected	
Roofing felt, small rocks	None Detected	
Stucco	None Detected	

No asbestos was detected in the analyzed samples. No further assessment is warranted related to the debris pile. The analytical report and chain of custody documentation for asbestos samples are provided in Appendix C.

4.0 Conclusions and Recommendations

Based on the analytical results, Converse has reached the following conclusions and recommendations:

- The reported concentrations of TPH in the diesel and oil range in the soil samples analyzed are below the current MSSLs based on a depth to groundwater of approximately 230 feet bgs.
- The reported concentrations of VOCs (benzene, toluene, and m,p xylenes) and SVOCs (Bis 2-ethylhexyl phthalate) in the soil samples analyzed are below their current RSLs for both residential or commercial land use and MSSLs, with the exception of benzene. However, the only reported concentration of benzene (1.66 ug/kg from location GP9A at 5 feet bgs) only exceeds the RSL for residential land use.
- All reported metals are below their respective RSL-r, with the exception of arsenic. However, concentrations of arsenic are less than the DTSC screening level for school sites of 12.0 mg/kg.
- A total of 14 VOCs were reported in the soil vapor samples. Currently, CHHSLs are only established for four of the 14 detected VOCs. The maximum reported concentrations of PCE, toluene and xylenes (150, 550, and 714 ug/m^3, respectively) reported in samples from this assessment were below their respective residential CHHSLs.

  Benzene was reported at a concentration of 241 ug/m^3 in the sample from location GP9C at 10 feet bgs, which exceeds the CHHSL-r of 122 ug/m^3. No concentrations of benzene were reported in any of the other samples analyzed as part of this investigation.
- The maximum reported concentrations of all VOCs in soil vapor samples are less than their respective commercial RSLs for indoor air with the following exceptions: 1,3-Butadiene, Chlorobenzene, and Ethylbenzene. Based on the limited number of detections of each of these three compounds, and their concentrations in soil vapor relative to their respective indoor air screening levels, these compounds are not considered to pose a significant risk.

Based on the analytical results of the initial samples collected during the December 2009 sampling event, additional sampling was conducted to further evaluate reported concentrations of PCE in soil vapor at location GP8, as well as concentrations of TPH and SVOCs in soil and VOCs in soil vapor at location GP9. The reported concentrations of metals, TPH, VOCs and SVOCs in soil samples and VOCs in soil vapor samples from the other eight sample locations at the Site were below current screening levels and did not warrant further investigation.

The reported concentration of PCE in the soil vapor sample from location GP8 at 10 feet bgs of 150 ug/m^3 appears to be anomalous, as PCE was not detected in the soil samples from this location at depths of 5 or 15 feet bgs, or in the shallower soil vapor sample from 5 feet bgs. Concentrations of PCE were also not reported in any of the soil vapor samples collected from step-out borings (GP8A, GP8B, or GP8C) at depths of 5, 10, and 17/20 feet bgs. The only reported concentration of PCE in soil vapor is less than the RSL-r of 180 ug/m^3, and therefore no further action is recommended.

Boring GP9 was located in a suspected area of former UST which were previously removed. The surface terrain in this area was slightly elevated with minor amounts of concrete debris observed in what is suspected to be an area of backfill. The reported concentrations of TPH and VOCs in soil and soil vapor samples collected from this area indicate a previous release from these former USTs.

A total of seven step-out borings were completed in the vicinity of location GP9. Odors were noted in the sample from location GP9C at 10 feet, which was reported to have the Site maximum TPH concentrations in the diesel and heavy oil ranges of 4,150 and 29,500 mg/kg, respectively. These concentrations are less than the MSSLs. Samples analyzed from greater depths at this location, and from adjacent step-out borings, indicated non-detect concentrations of TPH, which suggest that the area of impacted soil is limited. Similarly, the reported concentration of benzene in the field-analyzed soil vapor sample from 10 feet at GP9C was not detected in the confirmatory sample collected in a summa canister, suggesting the impact to be limited.

Results of this investigation reveal minor amounts of contaminants at various locations of the Site, but all concentrations are generally less than recommended screening levels. Analytical results from step-out borings, deeper samples, and confirmatory samples revealed the extents of contaminants to be limited laterally and vertically. The areas of concern appear to have been sufficiently assessed, and no further investigation is recommended at this time. However, further action may be warranted if odorous or discolored soils are encountered during site development activities.

No asbestos was detected in the analyzed samples from the debris pile. No further assessment is warranted related to the debris pile.

5.0 List of Preparers

Norman S. Eke
Managing Officer

B.A., Liberal Studies, Environmental Studies Emphasis, University of California, Santa Barbara, 1988.
Cal-EPA Registered Environmental Assessor I, #05654
Cal-OSHA Certified Asbestos Consultant, #96-2093

Managing Officer of the California environmental offices of Converse Consultants. Mr. Eke has 21 years of experience with Phase I & II Environmental Site Assessments, remediation, asbestos surveys, emergency response, hazardous waste transportation, hazardous materials management, compliance and permitting. Current duties include business development, client maintenance, technical review and approval of proposals and reports.

Principal area of responsibility for this ESA report: Asbestos Technical Review and Supervision.

Laura Tanaka
Principal Environmental Scientist

B.S., Biology, California State Polytechnic University, Pomona, 1987
Cal/EPA Registered Environmental Assessor, #06283
Cal-OSHA Site Surveillance Technician, #94-1388
DHS Certified Lead Inspector/Assessor, #I-3086
DHS Certified Project Designer, #D-3086
DHS Certified Project Monitor, #M-3086

Manager of the Phase I Environmental Site Assessment department of the Monrovia office. Ms. Tanaka has 19 years experience with Phase I and II ESAs, Preliminary Endangerment Assessments, asbestos surveys, lead-based paint surveys, abatement monitoring, as well as hazardous material audits, completing business plans, and SCAQMD permitting. Current duties at Converse include project management, business development and client maintenance, conducting/managing ESAs, and completing third party documents reviews.

Principal area of responsibility for this ESA report: Client Point of Contact, Quality Assurance/Quality Control and Technical Review.

Michael A. Van Fleet
Senior Geologist

B.A. Earth Science, University of California, Santa Cruz, 1999
California Professional Geologist, No. 7869

Mr. Van Fleet has 9 years of project experience working in the fields of environmental remediation and groundwater development. He has extensive field experience which includes overseeing the installation of groundwater production and monitoring wells, and assisting in the installation and maintenance of remediation systems. He has sampled wells for regulatory compliance, and assisted in conducting Phase II Assessment projects.

Principal area of responsibility for this ESA report: Field Oversight and Technical Review.

William L. Ragsdale
Project Environmental Scientist

B.S., Environmental Sciences, Almeda University, 2005
Environmental Management Program, Pacific Technical Trade School, Long Beach, California, 1998
Registered Environmental Assessor, #08046
DHS Certified Lead Inspector/Assessor, #14954

Mr. Ragsdale has over 13 years of environmental experience within the general areas of environmental consulting, including Phase I and II Environmental Site Assessments, site characterization and remediation, regulatory interaction/compliance and industrial health and safety. Mr. Ragsdale has successfully negotiated with and/or received closure from various regulatory agencies including Orange County Health Care Agency, Los Angeles Regional Water Quality Control Board and San Bernardino County Fire Department.

Principal area of responsibility for this ESA report: Project Management, Field Investigation Personnel, Report Generation and Report Review.

6.0 References

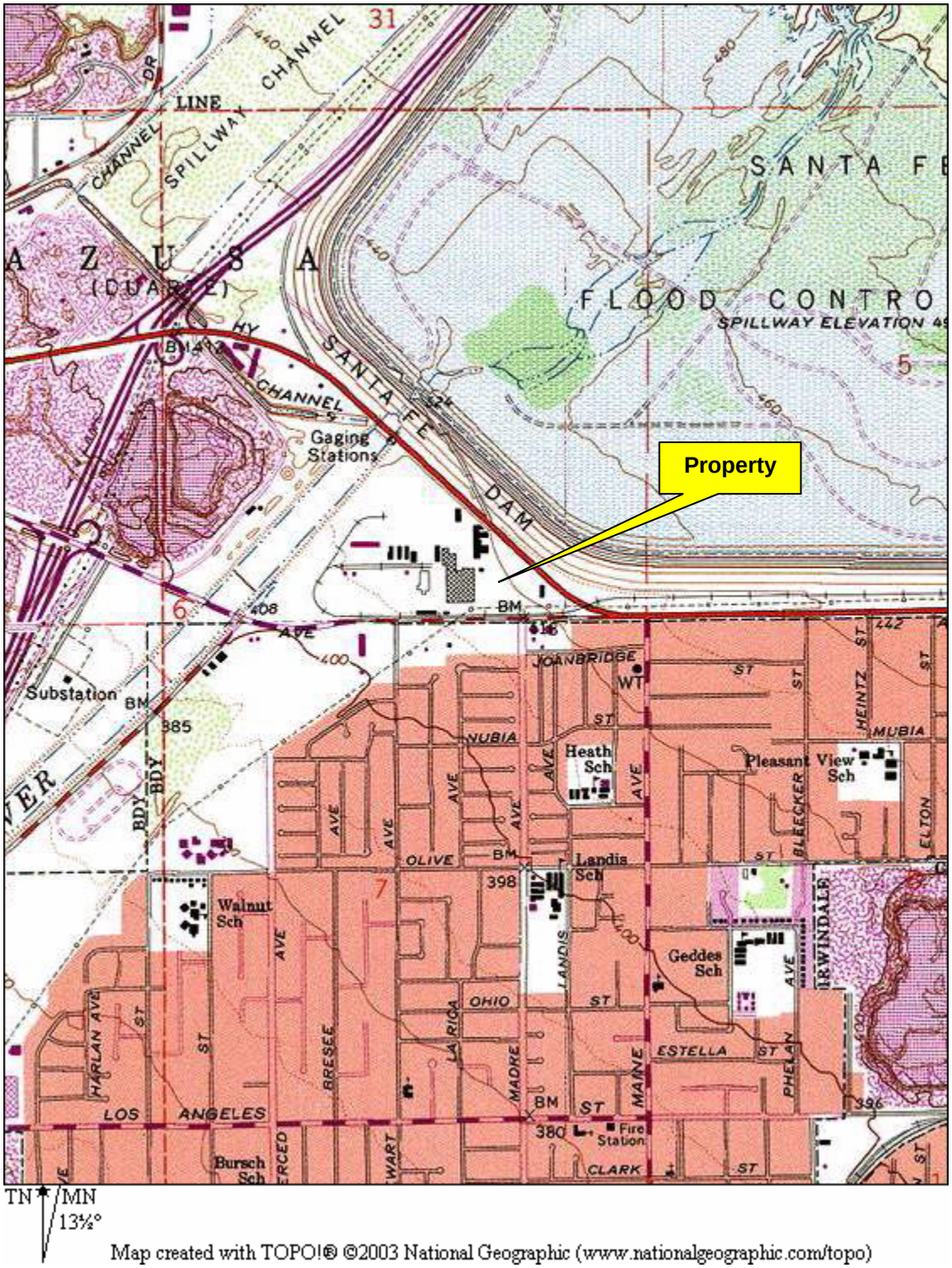
California Environmental Protection Agency, Use of California Human Health Screening Levels in Evaluation of Contaminated Properties, January 2005.

California Regional Water Quality Control Board, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, November 2007, revised May 2008.

Converse Consultants, Phase I Environmental Site Assessment Report, Approximate 17 Acre Lot located Live Oak Avenue and Arrow Highway, November 3, 2009.

United States Environmental Protection Agency, Regional Screening Levels, September 2008.

Figures



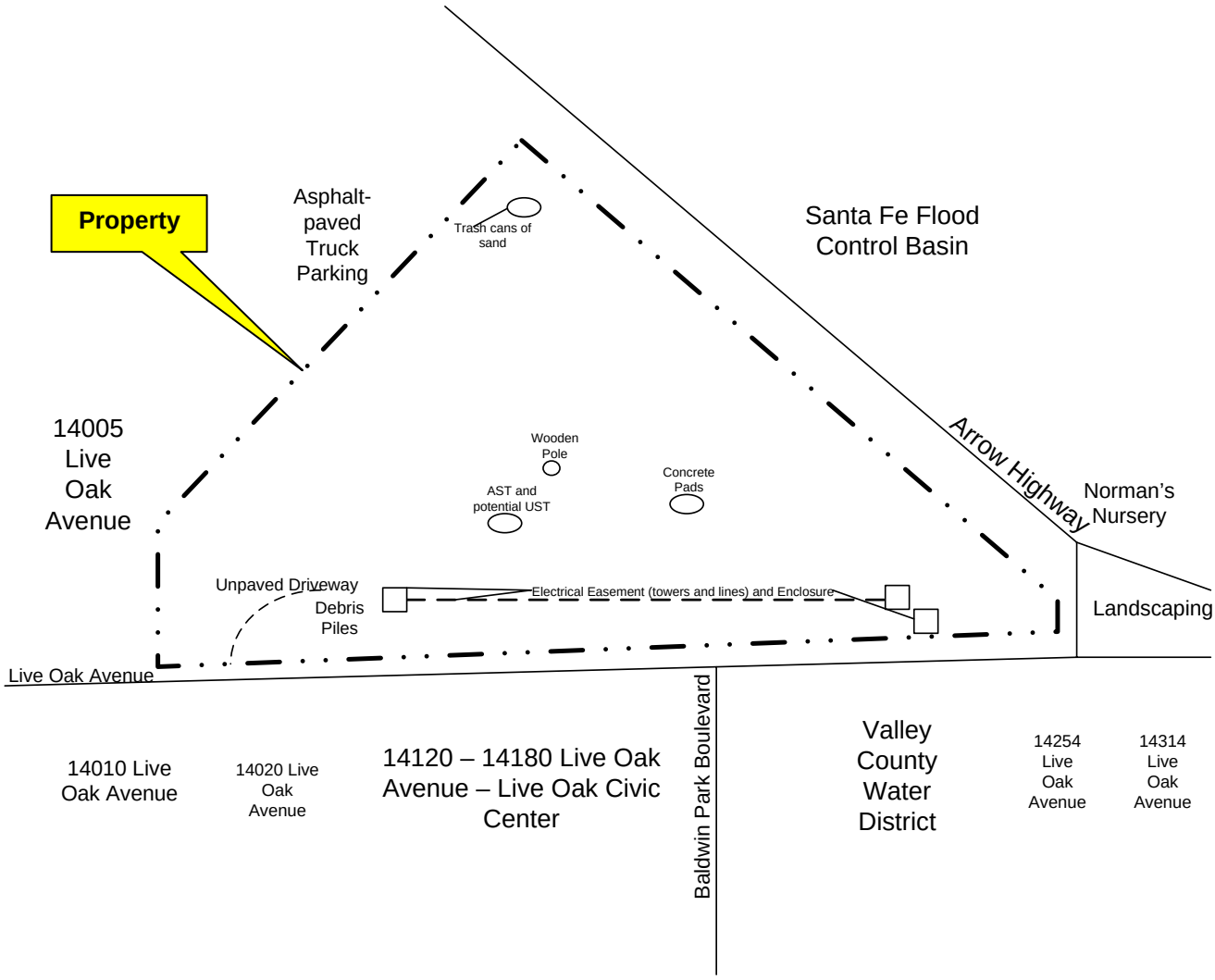
Area Map

Client: City of Irwindale
Approximate 17 Acre Lot, Irwindale, California

Project No:
09-42-138-02

Converse Consultants

FIGURE **1**



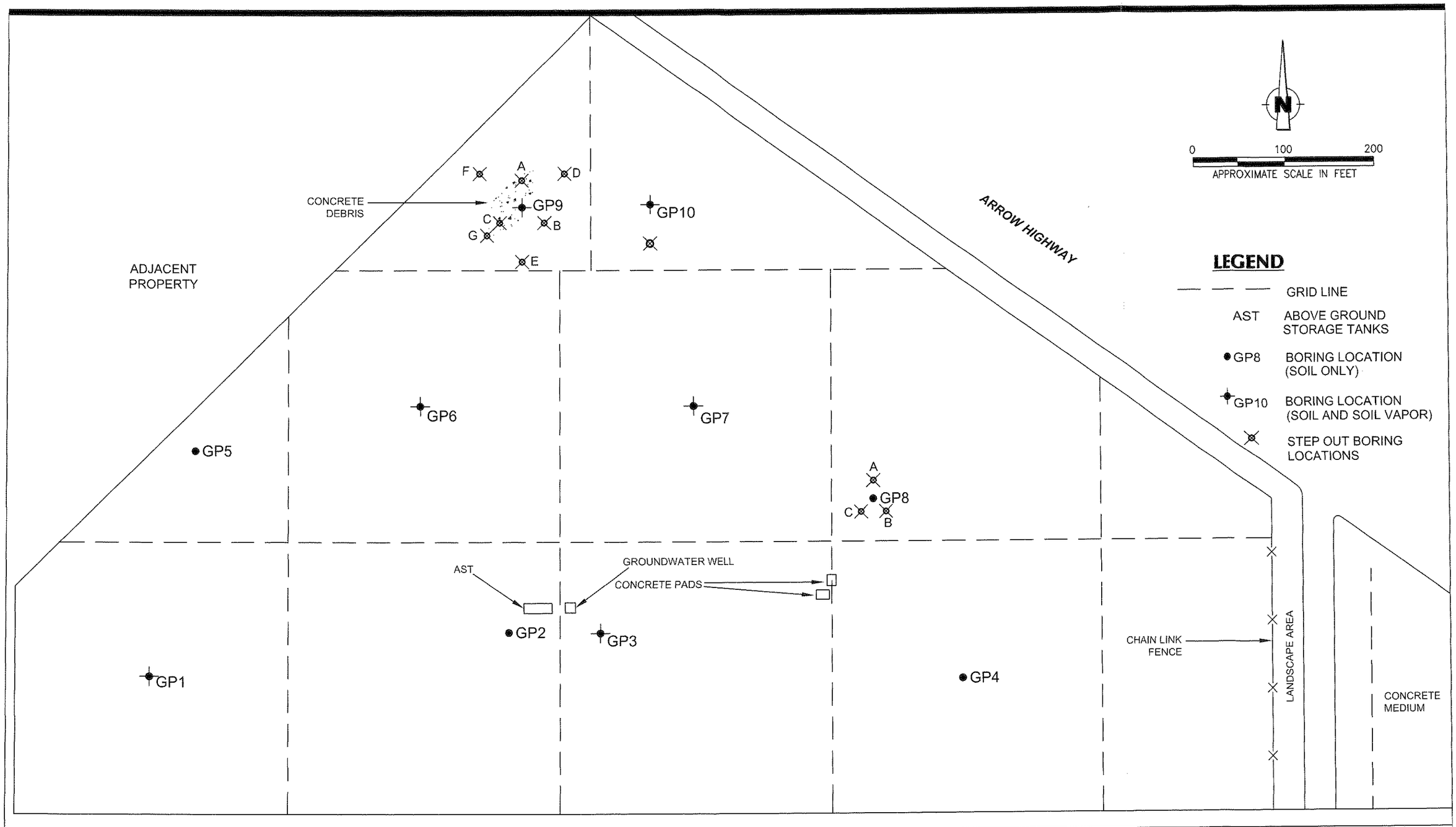
Property Plan

Client: City of Irwindale
Approximate 17 Acre Lot, Irwindale, California

Project No: 09-42-138-02

Converse Consultants

FIGURE **2**



BORING LOCATION MAP

Converse Consultants

CITY OF IRWINDALE
17 ACRE LOT LOCATED ON LIVE OAK AVE.
AND ARROW HIGHWAY
IRWINDALE, CALIFORNIA

Project No. 09-42-138-02

Figure No. 3

Tables

Table 1
Summary of Soil Vapor Sample Analytical Results
17 Acre Lot
Arrow Highway and Live Oak Avenue
Irwindale, California

Boring Identifier	Sample Depth (feet bgs)	Date Sampled	Volatile Organic Compounds (VOCs) - EPA METHOD 8260B (ug/m^3)														
			Benzene	Toluene	Ethyl benzene	Xylenes	Acetone	1,3-Butadiene	2-Butanone (MEK)	Carbon disulfide	Chloro benzene	Ethanol	Heptane	Hexane	PCE	Styrene	All Other VOCs
GP1	5**	12/18/2009	ND	**69**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP3	5**	12/18/2009	ND	**41**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10**		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP6	5**	12/18/2009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10**		ND	**77**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP7	5**	12/18/2009	ND	**88**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10**		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10 DUP**		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP8	5**	12/18/2009	ND	**49**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**56**	ND
	10**		ND	**39**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**150**	ND	ND
GP8A	5	2/15/2010	ND	**534**	**422**	**681**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10		ND	**36**	ND	ND	ND	N D	ND	ND	ND	N D	ND	ND	ND	**55**	ND
	17		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**72**	ND
GP8B	5	2/15/2010	ND	**538**	**427**	**689**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**739**	ND
	10		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**54**	ND
	20		ND	ND	ND	ND	**473** *	ND	ND	**4,530** *	ND	ND	ND	ND	ND	**97**	ND
GP8C	5	2/15/2010	ND	**550**	**367**	**714**	ND	ND	ND	ND	**618**	ND	ND	ND	ND	**755**	ND
	10		ND	**45**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**66**	ND
	20		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**56**	ND
	20 DUP		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**55**	ND
GP9	10**	12/18/2009	ND	**120**	ND	ND	**600**	**160**	**100**	**1,100**	ND	**180**	**94**	ND	ND	ND	ND
	10 DUP**		ND	**120**	ND	ND	**480**	**170**	**88**	**1,000**	ND		ND	ND	ND	ND	ND
GP9A	5	2/4/2010	ND	**66**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**247**	ND
	10		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**134**	ND
	20		ND	**79**	ND	**60**	ND	ND	**374** *	ND	ND	ND	ND	ND	ND	**280**	ND
	20 DUP		ND	**63**	ND	**62**	ND	ND	**416** *	ND	ND	ND	ND	ND	ND	**282**	
	20**		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP9B	5	2/4/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**109**	ND
	10		ND	**102**	ND	ND	ND	ND	**369** *	ND	ND	ND	ND	ND	ND	**256**	ND
	10**		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	17		ND	**55**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP9C	5	2/4/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**97**	ND
	10		**241**	**221**	ND	**60**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**253**	ND
	10**		ND	**81**	ND	**76**	ND	ND	ND	ND	ND	ND	ND	**253**	ND	ND	ND

Table 1
Summary of Soil Vapor Sample Analytical Results
17 Acre Lot
Arrow Highway and Live Oak Avenue
Irwindale, California

Boring Identifier	Sample Depth (feet bgs)	Date Sampled	Volatile Organic Compounds (VOCs) - EPA METHOD 8260B (ug/m^3)														
			Benzene	Toluene	Ethyl benzene	Xylenes	Acetone	1,3-Butadiene	2-Butanone (MEK)	Carbon disulfide	Chloro benzene	Ethanol	Heptane	Hexane	PCE	Styrene	All Other VOCs
GP9D	5	2/4/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**108**	ND
	10		ND	**135**	ND	**75**	ND	ND	**421 ***	ND	ND	ND	ND	ND	ND	**254**	ND
	10**		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**126**	ND
GP9E	5	2/4/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10		ND	**50**	ND	**48**	ND	ND	**363**	ND	ND	ND	ND	ND	ND	**233**	ND
	10**		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15		ND	ND	ND	**40**	ND	ND	**242**	ND	ND	ND	ND	ND	ND	**231**	ND
	15 DUP		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP9F	5	2/4/2010	ND	**37**	ND	**287**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**254**	ND
	10		ND	**194**	ND	**112**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**258**	ND
	10**		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	18		ND	ND	ND	**273**	ND	ND	**486**	ND	ND	ND	ND	ND	ND	**99**	ND
GP10	5**	12/18/2009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10**		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Residential CHHSL (CHHSL-r)			36.2	**135,000**	**NA**	**319,000**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**180**	**NA**	**NA**
Commercial/Industrial CHHSL (CHHSL-i)			122.0	**378,000**	**NA**	**887,000**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**603**	**NA**	**NA**
residential air RSL			**0.31**	**5,200**	**0.97**	**730**	**32,000**	**0.081**	**5,200**	**730**	**52**	**NA**	**NA**	**750**	**0.41**	**1,000**	**NA**
commercial air RSL			**1.6**	**22,000**	**4.9**	**3,100**	**140,000**	**0.41**	**22,000**	**3,100**	**220**	**NA**	**NA**	**3,100**	**2.1**	**4,400**	**NA**

bgs - Below ground surface
ug/m^3 - Micrograms per cubic meter
ND - Not Detected
N/A - Not Applicable or Available
Exceeds Residential and Commercial/Industrial CHHSLs

PCE - Tetrachloroethylene
MEK - Methyl Ethyl Ketone
CHHSL - California Human Health Screening Level
RSL EPA Regional Screening Level
DUP - Duplicate Sample

*- Trace Indicated Compounds (TIC)
**- Collect in summa canister and anlyzed by EPA Method TO15

TABLE 2

ANALYTICAL RESULTS - TOTAL PETROLEUM HYDROCARBONS, VOCs and SVOCs

17 Acre Lot Arrow Highway and Live Oak Avenue

Irwindale , California

Sample ID		Date Sampled	Total Petroleum Hydrocarbons (mg/kg)			Semi Volatile Organic Compounds (mg/kg)		Volatile Organic Compounds (ug/kg)			
Location	Depth (feet bgs)		C4 - C12	C9 - C23	C23 - C40	Bis (2-ethylhexyl) phthalate	All Other SVOCs	Benzene	Toulene	m,p Xylenes	All Other VOCs
GP1	1	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10		**ND**	**ND**	**ND**	NA	NA	**ND**	**ND**	**ND**	**ND**
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP2	1	12/18/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10		**ND**	**ND**	**ND**	NA	NA	**ND**	**ND**	**ND**	**ND**
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP3	1	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10		NA	NA	NA	NA	NA	NA	NA	NA	NA
	15		**ND**	**ND**	**ND**	NA	NA	**ND**	**ND**	**ND**	**ND**
GP4	1	12/18/2019	**ND**	**ND**	**ND**	NA	NA	**ND**	**ND**	**ND**	**ND**
	5		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10		NA	NA	NA	NA	NA	NA	NA	NA	NA
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP5	1	12/18/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		**ND**	**ND**	**ND**	NA	NA	**ND**	**ND**	**ND**	**ND**
	10		NA	NA	NA	NA	NA	NA	NA	NA	NA
	15		**ND**	**ND**	**ND**	NA	NA	**ND**	**ND**	**ND**	**ND**
GP6	1	12/17/2009	**ND**	**ND**	**89.9**	NA	NA	**ND**	**ND**	**ND**	**ND**
	5		NA	NA	NA	NA	NA	NA	NA	NA	NA
	10		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP7	1	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		**ND**	**ND**	**101**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10		**ND**	**ND**	**ND**	NA	NA	**ND**	**ND**	**ND**	**ND**
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP8	1	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10		NA	NA	NA	NA	NA	NA	NA	NA	NA
	15		**ND**	**16.1**	**83**	NA	NA	**ND**	**ND**	**ND**	**ND**
GP9	1	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		**ND**	**170.0**	**906**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10		NA	NA	NA	NA	NA	NA	NA	NA	NA
	15		**ND**	**36.7**	**941**	**2.69**	**ND**	**ND**	**ND**	**ND**	**ND**

TABLE 2
ANALYTICAL RESULTS - TOTAL PETROLEUM HYDROCARBONS, VOCs and SVOCs
17 Acre Lot Arrow Highway and Live Oak Avenue
Irwindale , California

Sample ID		Date Sampled	Total Petroleum Hydrocarbons (mg/kg)			Semi Volatile Organic Compounds (mg/kg)		Volatile Organic Compounds (ug/kg)			
Location	Depth (feet bgs)		C4 - C12	C9 - C23	C23 - C40	Bis (2-ethylhexyl) phthalate	All Other SVOCs	Benzene	Toulene	m,p Xylenes	All Other VOCs
GP9A	1	2/15/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		NA	NA	NA	NA	NA	**1.66**	**3.29**	**3.65**	**ND**
	10		NA	NA	NA	**ND**	**ND**	**ND**	**ND**	**2.45**	**ND**
	15		NA	NA	NA	**ND**	**ND**	NA	NA	NA	NA
	20		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP9B	1	2/15/2010	NA	NA	NA	NA	NA	**ND**	**ND**	**ND**	**ND**
	5		NA	NA	NA	**ND**	**ND**	NA	NA	NA	NA
	10		NA	NA	NA	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
	20		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP9C	1	2/15/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		**ND**	**1,530**	**7,990**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10		**ND**	**4,150**	**29,500**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10(A)		NA	**267**	**2,170**	NA	NA	NA	NA	NA	NA
	15(A)		NA	**ND**	**ND**	NA	NA	NA	NA	NA	NA
	20(A)		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP9D	1	2/15/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		NA	NA	NA	NA	NA	**ND**	**ND**	**ND**	**ND**
	12		NA	NA	NA	NA	NA	**ND**	**ND**	**ND**	**ND**
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP9E	1	2/15/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		NA	NA	NA	NA	NA	**ND**	**ND**	**ND**	**ND**
	10		NA	NA	NA	NA	NA	**ND**	**ND**	**ND**	**ND**
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
	20		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP9F	1	2/15/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		NA	NA	NA	NA	NA	**ND**	**ND**	**ND**	**ND**
	10		NA	NA	NA	NA	NA	**ND**	**ND**	**ND**	**ND**
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
	20		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP9-G	1	2/15/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		NA	NA	NA	NA	NA	NA	NA	NA	NA
	10		NA	**ND**	**ND**	NA	NA	NA	NA	NA	NA
	15		NA	**ND**	**ND**	NA	NA	NA	NA	NA	NA
	20		NA	NA	NA	NA	NA	NA	NA	NA	NA
GP10	1	12/18/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
	10		**ND**	**ND**	**ND**	NA	NA	**ND**	**ND**	**ND**	**ND**
	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
Method Detection Limit (MDL)			**0.1**	**1.0**	**1.0**	**0.25**	**NA**	**1.0**	**1.0**	**1.0**	**NA**
MSSLs - TPH values for soil ≥ 150 feet above groundwater			**1000**	**10,000**	**50,000**	**NA**	**NA**	**44**	**2,000**	**23,000**	**NA**
RSLr - Residentail			**NA**	**NA**	**NA**	**35**	**NA**	**1.1**	**5,000**	**4,700**	**NA**
RSLi - Industrial			**NA**	**NA**	**NA**	**120**	**NA**	**5.6**	**46,000**	**20,000**	**NA**

mg/kg - Milligrams per Kilogram
ug/kg - Micrograms per Kilogram
bgs - Below ground surface
MSSLs - Maximum Soil Screening Levels
All Samples Analyzed in Accordance with EPA Method 8015B
ND - Non Detect abve Methoid Dectection Limit

TABLE 2

ANALYTICAL RESULTS - TOTAL PETROLEUM HYDROCARBONS, VOCs and SVOCs

17 Acre Lot Arrow Highway and Live Oak Avenue

Irwindale , California

Sample ID		Date Sampled	Total Petroleum Hydrocarbons (mg/kg)			Semi Volatile Organic Compounds (mg/kg)		Volatile Organic Compounds (ug/kg)			
Location	Depth (feet bgs)		C4 - C12	C9 - C23	C23 - C40	Bis (2-ethylhexyl) phthalate	All Other SVOCs	Benzene	Toulene	m,p Xylenes	All Other VOCs

NA - Not Applicable/Not Analyzed

(A) - Sample collected from co-located boring

TABLE 3
ANALYTICAL RESULTS - TITLE 22 METALS
17 Acre Lot Arrow Highway and Live Oak Avenue
Irwindale , California

Sample ID		Date Sampled	Title 22 Metals (mg/kg)															
Location	Depth (feet)		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
GP1	1.0	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5.0		**ND**	**ND**	**32.3**	**ND**	**ND**	**4.55**	**3.2**	**5.95**	**ND**	**ND**	**ND**	**3.25**	**ND**	**ND**	**ND**	**9.8**	**18**
	10.0		**ND**	**ND**	**74.8**	**ND**	**ND**	**15**	**4.95**	**9.15**	**ND**	**ND**	**ND**	**6.9**	**ND**	**ND**	**ND**	**15.3**	**32**
	15.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP2	1.0	12/18/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5.0		**1.35**	**ND**	**43**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**39**	**45**
	10.0		**1**	**ND**	**41.8**	**ND**	**ND**	**3.4**	**3.45**	**9**	**ND**	**ND**	**ND**	**2.7**	**ND**	**ND**	**ND**	**9.85**	**18.1**
	15.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP3	1.0	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5.0		**ND**	**ND**	**91.1**	**ND**	**ND**	**12.8**	**7.45**	**13.9**	**ND**	**ND**	**ND**	**9.85**	**ND**	**ND**	**ND**	**25.1**	**37.2**
	10.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	15.0		**ND**	**ND**	**58.2**	**ND**	**ND**	**3.3**	**4.05**	**11.7**	**ND**	**ND**	**ND**	**3.05**	**ND**	**ND**	**ND**	**14**	**35.5**
GP4	**1.0**	12/18/2009	**ND**	**1.6**	**97.9**	**ND**	**1.35**	**14.1**	**8.35**	**19.1**	**14.2**	**ND**	**ND**	**11.2**	**ND**	**ND**	**ND**	**26.2**	**85.8**
	5.0		**ND**	**2.2**	**25.2**	**ND**	**ND**	**6.2**	**2.75**	**ND**	**9.9**	**ND**	**ND**	**6.95**	**ND**	**ND**	**ND**	**5.65**	**23.8**
	10.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	15.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP5	1.0	12/18/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5.0		**ND**	**2.5**	**107**	**ND**	**ND**	**14.2**	**8.5**	**17.5**	**ND**	**ND**	**ND**	**11.2**	**ND**	**ND**	**ND**	**27.5**	**46**
	10.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	15.0		**ND**	**ND**	**51.7**	**ND**	**ND**	**5.8**	**3.85**	**7.8**	**ND**	**ND**	**ND**	**3.7**	**ND**	**ND**	**ND**	**12.9**	**32.8**
GP6	**1.0**	12/17/2009	**ND**	**1**	**56.2**	**ND**	**ND**	**6.7**	**4.3**	**9.1**	**2.5**	**ND**	**ND**	**4.2**	**ND**	**ND**	**ND**	**16.6**	**32.1**
	5.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10.0		**ND**	**ND**	**54.6**	**ND**	**ND**	**4.5**	**4.05**	**6.05**	**ND**	**ND**	**ND**	**3.65**	**ND**	**ND**	**ND**	**15.8**	**24.8**
	15.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP7	1.0	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5.0		**ND**	**1.75**	**64.6**	**ND**	**ND**	**9**	**5.5**	**12.5**	**10.2**	**ND**	**ND**	**7.15**	**ND**	**ND**	**ND**	**18.8**	**38.4**
	10.0		**ND**	**ND**	**47.9**	**ND**	**ND**	**6.9**	**4.3**	**7.6**	**ND**	**ND**	**ND**	**5.25**	**ND**	**ND**	**ND**	**14.4**	**22.8**
	15.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP8	1.0	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5.0		**ND**	**ND**	**38**	**ND**	**ND**	**5.55**	**3.4**	**5.35**	**ND**	**ND**	**ND**	**4.4**	**ND**	**ND**	**ND**	**10.5**	**21.9**
	10.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	15.0		**ND**	**ND**	**67**	**ND**	**ND**	**9.2**	**6.85**	**5.55**	**ND**	**ND**	**ND**	**6.2**	**ND**	**ND**	**ND**	**21.6**	**44.9**
GP9	1.0	12/18/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5.0		**ND**	**ND**	**56.1**	**ND**	**ND**	**10.1**	**5.85**	**15.4**	**11.1**	**ND**	**ND**	**7.7**	**ND**	**ND**	**ND**	**20.1**	**54.8**
	10.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	15.0		**ND**	**ND**	**51.4**	**ND**	**ND**	**6.75**	**3.95**	**7**	**ND**	**ND**	**ND**	**6.25**	**ND**	**ND**	**ND**	**11.5**	**27.6**
GP10	1.0	12/17/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5.0		**ND**	**1.95**	**119**	**ND**	**1.35**	**1.5**	**9.3**	**19.1**	**5**	**0.209**	**ND**	**12.9**	**ND**	**ND**	**ND**	**30.9**	**56.5**
	10.0		**ND**	**ND**	**52.6**	**ND**	**ND**	**8.05**	**5.65**	**17.5**	**ND**	**0.196**	**ND**	**7.1**	**ND**	**ND**	**ND**	**17**	**27.7**
	15.0		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RSLs	**Residential**		**31.0**	**0.390**	**15,000**	**160**	**70**	**280**	**23.0**	**3,100**	**400**	**6.7**	**390**	**1,600**	**390**	**390**	**5.1**	**550.0**	**3,100**
	Industrial		**410**	**1.60**	**190,000**	**2,000**	**810**	**1,400**	**300**	**41,000**	**800**	**28**	**5,100**	**20,000**	**51,000**	**51,000**	**66**	**7,200**	**31,000**
CHHSLs	**Residential**		**30.0**	**0.07**	**5,200**	**150**	**1.7**	**17.0**	**660**	**3,000**	**150**	**18.0**	**380**	**1,600**	**380**	**380**	**5.0**	**530**	**23,000**
	Commercial / Industrial		**380**	**0.24**	**63,000**	**1,700**	**7.5**	**37.0**	**3,200**	**38,000**	**3,500**	**180**	**4,800**	**16,000**	**4,800**	**4,800**	**63.0**	**6,700**	**100,000**

CHHSL - California Human Health Screening Level
mg/L - Milligrams per Liter
mg/kg - Milligrams per Kilogram
ND - Not Detected
Samples Analyzed in Accordance with EPA Test Methods 6010B/7471A

NA - Not Analyzed or Not Applicable
RSLs Regional Screening Levels
STLC - Soluble Threshold Limit Concentration
TCLP - Toxicity Characteristic Leaching Procedure

Soil & Soil Vapor Analytical Report & Chain of Custody Documentation

Appendix A

American Environmental Testing Laboratory Inc.

2834 & 2908 North Naomi Street, Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
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Ordered By

Converse Consultants
185 E. Paularino Avenue Suite B
Costa Mesa, CA 92626

Telephone: (714)444-9660
Attention: William Ragsdale

Number of Pages	3
Date Received	02/15/2010
Date Reported	02/19/2010

Job Number	Order Date	Client
55927	02/15/2010	CONVRS

Project ID: 09-41-138-02
Project Name: City of Irwindale
Site: Live Oak Avenue
Irwindale, CA

Enclosed please find results of analyses of 4 soil samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Checked By: _____ Approved By: _____

Cyrus Razmara, Ph.D.
Laboratory Director

American Environmental Testing Laboratory Inc.

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CHAIN OF CUSTODY RECORD

№ 69276

AETL JOB No. 55927

Page 1 of 1

COMPANY: Converse Consultants	PROJECT MANAGER: 09-42-138-02 K.K.R
COMPANY ADDRESS: 185 E. Parkridge Ave Corona Mesa, CA 92626	PHONE: 714-444-9600 / FAX: 714-444-9614
PROJECT NAME: City of Irwindale	PROJECT #: 09-42-138-02
SITE NAME AND ADDRESS: LNG Offsite Area, Irwindale CA	PO #

	SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.	ANALYSIS REQUESTED: 8015M Diesel & Oil, Archive	TEST INSTRUCTIONS & COMMENTS
1	GPGC-10A	55927-01	2/15/10	1:20	Soil	1 Sleeve	Ice	X	Diesel & Oil only / NO BTEX Analysis
2	15A	55927-02		1:25				X	
3	20A	55927-03		1:35				Archive	
4	GPGC-1	55927-04		2:15					
5	5	55927-05		2:20					
6	10	55927-06		2:25				X	
7	15	55927-07		2:39				X	
8	20	55927-08		2:45					
9									
10									
11									
12									
13									
14									
15									

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS	8	PROPERLY COOLED Y / N / NA	
CUSTODY SEALS Y / N / NA		SAMPLES INTACT Y / N / NA	
RECEIVED IN GOOD COND. Y / N		SAMPLES ACCEPTED Y / N	

TURN AROUND TIME

☒ NORMAL ☐ RUSH ☐ SAME DAY ☐ NEXT DAY ☐ 2 DAYS ☐ 3 DAYS

RELINQUISHED BY SAMPLER: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature:	Signature:	Signature:
Printed Name: Kevin Ruggles	Printed Name:	Printed Name:
Date: 2/15/10 Time: 1530	Date: Time:	Date: 2/15-10 Time: 1610
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY LABORATORY: AETL 3.**
Signature:	Signature:	Signature:
Printed Name:	Printed Name:	Printed Name:
Date: 2/15-10 Time: 1530	Date: Time:	Date: 2/15-10 Time: 1610

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator

TABLE
Summary of Soil Analytical Results for TPH as Diesel and Heavy Hydrocarbons Using GC/FID
Live Oak Avenue Irwindale, CA

TPH as Diesel and Heavy Hydrocarbons Using GC/FID. Method: (M8015D)

Sample ID	Units	GP9C-10A	GP9C-15A	GP9G-10	GP9G-15
Sample Date		2/15/2010	2/15/2010	2/15/2010	2/15/2010
Laboratory Job Number		55927	55927	55927	55927
TPH as Diesel (C9-C22)	mg/Kg	**267**	ND<1.0	ND<1.0	ND<1.0
TPH as Heavy Hydrocarbons (C23-C40)	mg/Kg	**2,170**	ND<1.0	ND<1.0	ND<1.0
TPH Total as Diesel and Heavy HC. C9-C40	mg/Kg	**2,440**	ND<1.0	ND<1.0	ND<1.0

1) "ND<X" INDICATES CONSTITUENT(S) NOT DETECTED AT OR ABOVE METHOD DETECTION LIMIT.
2) "J" INDICATES ANALYTE WAS DETECTED. HOWEVER, ANALYTE CONCENTRATION IS AN ESTIMATED VALUE WHICH IS BETWEEN THE METHOD DETECTION LIMIT (MDL) AND THE PRACTICAL QUANTITATION LIMIT(PQL).
3) "D" INDICATES THE SAMPLE WAS DILUTED TO BRING THE ANALYTE CONCENTRATION WITHIN CALIBRATION RANGE.

File: SO_M8015D.xls

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ANALYTICAL RESULTS

Ordered By

Converse Consultants
185 E. Paularino Avenue
Suite B
Costa Mesa, CA 92626

Telephone: (714)444-9660
Attn: William Ragsdale
Page: 2

Site

Live Oak Avenue
Irwindale, CA

Project ID: 09-41-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55927	02/15/2010	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 021610DB1

Our Lab I.D.			Method Blank	**55927.01**	**55927.02**	**55927.06**	**55927.07**
Client Sample I.D.				GP9C-10A	GP9C-15A	GP9G-10	GP9G-15
Date Sampled				02/15/2010	02/15/2010	02/15/2010	02/15/2010
Date Prepared			02/16/2010	02/16/2010	02/16/2010	02/16/2010	02/16/2010
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			02/16/2010	02/16/2010	02/16/2010	02/17/2010	02/17/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH as Diesel (C9-C22)	1.0	10.0	ND	267	ND	ND	ND
TPH as Heavy Hydrocarbons (C23-C40)	1.0	10.0	ND	2,170	ND	ND	ND
TPH Total as Diesel and Heavy HC. C9-C40	1.0	10.0	ND	2,440	ND	ND	ND
Our Lab I.D.			Method Blank	**55927.01**	**55927.02**	**55927.06**	**55927.07**
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Chlorobenzene	75-125		101	97.6	102	100	102

American Environmental Testing Laboratory Inc.

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QUALITY CONTROL RESULTS

Ordered By

Converse Consultants
185 E. Paularino Avenue
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Costa Mesa, CA 92626

Telephone: (714)444-9660
Attn: William Ragsdale
Page: 3

Site

Live Oak Avenue
Irwindale, CA

Project ID: 09-41-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55927	02/15/2010	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 021610DB1; Dup or Spiked Sample: 55927.02; LCS: Clean Sand; QC Prepared: 02/16/2010; QC Analyzed: 02/17/2010; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
TPH as Diesel (C9-C22)	0.00	500	510	102	500	510	102	<1	75-125	<20
Surrogates										
Chlorobenzene	0.00	100	96.4	96.4	100	96.4	96.4	<1	75-125	<20

QC Batch No: 021610DB1; Dup or Spiked Sample: 55927.02; LCS: Clean Sand; QC Prepared: 02/16/2010; QC Analyzed: 02/17/2010; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
TPH as Diesel (C9-C22)	500	486	97.2	75-125						
Surrogates										
Chlorobenzene	100	95.1	95.1	75-125						

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Data Qualifiers and Descriptors

Data Qualifier:

*:	In the QC section, sample results have been taken directly from the ICP reading. No preparation factor has been applied.
B:	Analyte was present in the Method Blank.
D:	Result is from a diluted analysis.
E:	Result is beyond calibration limits and is estimated.
H:	Analysis was performed over the allowed holding time due to circumstances which were beyond laboratory control.
J:	Analyte was detected . However, the analyte concentration is an estimated value, which is between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL).
M:	Matrix spike recovery is outside control limits due to matrix interference. Laboratory Control Sample recovery was acceptable.
MCL:	Maximum Contaminant Level
NS:	No Standard Available
S6:	Surrogate recovery is outside control limits due to matrix interference.
S8:	The analysis of the sample required a dilution such that the surrogate concentration was diluted below the method acceptance criteria.
X:	Results represent LCS and LCSD data.

Definition:

%Limi:	Percent acceptable limits.
%REC:	Percent recovery.
Con.L:	Acceptable Control Limits
Conce:	Added concentration to the sample.
LCS:	Laboratory Control Sample
MDL:	Method Detection Limit is a statistically derived number which is specific for each instrument, each method, and each compound. It indicates a distinctively detectable quantity with 99% probability.

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Data Qualifiers and Descriptors

MS:	Matrix Spike
MS DU:	Matrix Spike Duplicate
ND:	Analyte was not detected in the sample at or above MDL.
PQL:	Practical Quantitation Limit or ML (Minimum Level as per RWQCB) is the minimum concentration that can be quantified with more than 99% confidence. Taking into account all aspects of the entire analytical instrumentation and practice.
Recov:	Recovered concentration in the sample.
RPD:	Relative Percent Difference

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Converse Consultants
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Telephone: (714)444-9660
Attention: William Ragsdale

Number of Pages 31
Date Received 02/05/2010
Date Reported 02/15/2010

Job Number	Order Date	Client
55812	02/05/2010	CONVRS

Project ID: 09-42-138-02
Project Name: City of Irwindale
Site: Arrow Hwy
Irwindale, CA

Enclosed please find results of analyses of 13 soil samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Checked By: _____ Approved By: C. Razmara

Cyrus Razmara, Ph.D.
Laboratory Director

American Environmental Testing Laboratory Inc.

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CHAIN OF CUSTODY RECORD

№ 67365

AETL JOB No. 55812

COMPANY: Converse Consultants	PROJECT MANAGER: William Ragsdale
COMPANY ADDRESS: 185 E. Parkridge Ave Suite B Corta Mesa, CA	PHONE: 714-444-4660 / FAX: 714-444-9640
PROJECT NAME: City of Irwindale	PROJECT #: 09-42-138-02
SITE NAME AND ADDRESS: Arrow Hwy Irwindale, CA	PO #

	SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
1	6PGA - 1	55812.01	2/4/10	7:50	SOIL	5409's 1 SLEEVE	ICE
2	5	55812.02		7:52			
3	10	55812.03		7:55			
4	15	55812.04		8:00			
5	20	55812.05		8:11			
6	6PGB - 1	55812.06		9:12			
7	5	55812.07		9:15			
8	10	55812.08		9:18			
9	15	55812.09		9:22			
10	17	55812.10		9:25			
11	6PGC - 1	55812.11		10:20			
12	5	55812.12		10:23			
13	10	55812.13		10:47			
14							
15							

ANALYSIS REQUESTED

8260 VOC's	8270 SVOC's	8015 cc	Archive	Archive
				X
X	*			
X	*			
				X
				X
X				
	*			X
X	*			
				X
				X
				X
X	X	X		
X	X	X		

TEST INSTRUCTIONS & COMMENTS

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS	65	PROPERLY COOLED (Y) N / NA	
CUSTODY SEALS Y / (N) / NA		SAMPLES INTACT (Y) N / NA	
RECEIVED IN GOOD COND. (Y) N		SAMPLES ACCEPTED (Y) N	

TURN AROUND TIME

☒ NORMAL ☐ RUSH ☐ SAME DAY ☐ NEXT DAY ☐ 2 DAYS ☐ 3 DAYS

RELINQUISHED BY SAMPLER: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature:	Signature:	Signature:
Printed Name: William Ragsdale	Printed Name:	Printed Name: Bryant
Date: 2/4/10 Time: 0910	Date: Time:	Date: 2/5-10 Time: 1000
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY LABORATORY: 3.**
Signature:	Signature:	Signature:
Printed Name: Bryant	Printed Name:	Printed Name: Julius
Date: 2/5-10 Time: 0910	Date: Time:	Date: 2/5-10 Time: 1000

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator

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CHAIN OF CUSTODY RECORD

№ 67361

AETL JOB No. 55812

COMPANY	Converse Consultants
PROJECT MANAGER	William Ragsdale
COMPANY ADDRESS	185 E. Paularino Ave Suite B, Costa Mesa CA
PHONE	714-444-9660
FAX	714-444-9640
PROJECT NAME	City of Irvine
PROJECT #	09-92-138-02
SITE NAME AND ADDRESS	Arrow Hwy Irvine, CA
PO #	

	SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
1	GP9D - 1	55812.14	2/4/10	12:00	Soil	5 VOA's 1 sleeve	Ice
2	5	55812.15		12:05			
3	12	55812.16		12:35			
4	15	55812.17		12:40			
5	GP9E - 1	55812.18		13:30			
6	5	55812.19		13:35			
7	10	55812.20		13:40			
8	15	55812.21		13:45			
9	GP9F - 1	55812.22		14:32			
10	5	55812.23		14:35			
11	10	55812.24		14:40			
12	15	55812.25		14:45			
13	18	55812.26		15:00			
14							
15							

ANALYSIS REQUESTED

8260 VOC's	8270 SVOC's	8015 GC	Archive
			X
X			
X			
			X
			X
X			
X			
			X
X			
X			
			X
			X
			X

TEST INSTRUCTIONS & COMMENTS

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS	65	PROPERLY COOLED (Y) N / NA	
CUSTODY SEALS Y / (N) NA		SAMPLES INTACT (Y) N / NA	
RECEIVED IN GOOD COND. (Y) N		SAMPLES ACCEPTED (Y) N	

TURN AROUND TIME

[X] NORMAL [ ] RUSH [ ] SAME DAY [ ] NEXT DAY [ ] 2 DAYS [ ] 3 DAYS

RELINQUISHED BY SAMPLER: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature:	Signature:	Signature:
Printed Name: William Ragsdale	Printed Name:	Printed Name: Wright
Date: 2/4/10 Time: 0910	Date: Time:	Date: 2/5/10 Time: 1000
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY LABORATORY: 3.**
Signature:	Signature:	Signature:
Printed Name: Wright	Printed Name:	Printed Name:
Date: 2/5/10 Time: 0910	Date: Time:	Date: 2/5/10 Time: 1000

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator

Jim Lin

From: wragsdale@converseconsultants.com
Sent: Monday, February 15, 2010 10:53 AM
To: Jim Lin
Subject: Re: Summary results of analysis of samples from project "City of Irwindale, Irwindale, CA"

Jim please analyze GP9A and GP9B at the 5 and 10 feet for 8270 SVOCs

Thanks
William Ragsdale
Sent from my BlackBerry® wireless handheld

-----Original Message-----
From: "Jim Lin" <jiml@aetlab.com>
Date: Mon, 15 Feb 2010 10:09:54
To: William Ragsdale \(Converse\)<WRagsdale@ConverseConsultants.com>
Cc: Heidi L. Yavornicky \(Converse\)<hyavornicky@ConverseConsultants.com>; Michael Van Fleet \(Converse\)<mvanfleet@converseconsultants.com>
Subject: Summary results of analysis of samples from project "City of Irwindale, Irwindale, CA"

Dear William, Michael & Heidi,

Herewith please find Summary results of analysis of samples from project "City of Irwindale, Irwindale, CA"

AETL Job No: 55812 (Additional analysis in process, please e-mail authorization)

Thank you.

Should you have additional question, please feel free to contact us.

Jim Lin
Operations Manager
AETL
818-845-8200

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ANALYTICAL RESULTS

Ordered By

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Suite B
Costa Mesa, CA 92626

Telephone: (714)444-9660
Attn: William Ragsdale
Page: **2**

Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0205102A1

Our Lab I.D.			Method Blank	55812.02	55812.03	55812.06	55812.08
Client Sample I.D.				GP9A-5	GP9A-10	GP9B-1	GP9B-10
Date Sampled				02/04/2010	02/04/2010	02/04/2010	02/04/2010
Date Prepared			02/05/2010	02/05/2010	02/05/2010	02/05/2010	02/05/2010
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			02/05/2010	02/05/2010	02/05/2010	02/05/2010	02/05/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	25	50	ND	ND	ND	ND	ND
Benzene	1.0	10.0	ND	1.66J	ND	ND	ND
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND	ND	ND	ND
Bromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromodichloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	25	50	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	15	30	ND	ND	ND	ND	ND
2-Butanone (MEK)	25	50	ND	ND	ND	ND	ND
n-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Carbon Disulfide	25	50	ND	ND	ND	ND	ND
Carbon tetrachloride	5.0	10.0	ND	ND	ND	ND	ND
Chlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
Chloroethane	15	30	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50	50	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	5.0	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	15	30	ND	ND	ND	ND	ND
2-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	25	50	ND	ND	ND	ND	ND
Dibromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND	ND	ND	ND
Dibromomethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0205102A1

Our Lab I.D.			Method Blank	55812.02	55812.03	55812.06	55812.08
Client Sample I.D.				GP9A-5	GP9A-10	GP9B-1	GP9B-10
Date Sampled				02/04/2010	02/04/2010	02/04/2010	02/04/2010
Date Prepared			02/05/2010	02/05/2010	02/05/2010	02/05/2010	02/05/2010
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			02/05/2010	02/05/2010	02/05/2010	02/05/2010	02/05/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Dichlorodifluoromethane	15	30	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
Ethylbenzene	1.0	10.0	ND	ND	ND	ND	ND
Hexachlorobutadiene	15	30	ND	ND	ND	ND	ND
2-Hexanone	25	50	ND	ND	ND	ND	ND
Iodomethane	5.0	10.0	ND	ND	ND	ND	ND
Isopropylbenzene	5.0	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND	ND	ND	ND
Methylene chloride (DCM)	25	50	ND	ND	ND	ND	ND
Naphthalene	5.0	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Styrene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
Tetrachloroethene	5.0	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	1.0	10.0	ND	3.29J	ND	ND	ND
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
Trichloroethene	5.0	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0205102A1

Our Lab I.D.			Method Blank	**55812.02**	**55812.03**	**55812.06**	**55812.08**
Client Sample I.D.				GP9A-5	GP9A-10	GP9B-1	GP9B-10
Date Sampled				02/04/2010	02/04/2010	02/04/2010	02/04/2010
Date Prepared			02/05/2010	02/05/2010	02/05/2010	02/05/2010	02/05/2010
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			02/05/2010	02/05/2010	02/05/2010	02/05/2010	02/05/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2,3-Trichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Vinyl Acetate	25	50	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	15	30	ND	ND	ND	ND	ND
o-Xylene	1.0	10.0	ND	ND	ND	ND	ND
m,p-Xylenes	1.0	20.0	ND	3.65J	2.45J	ND	ND
Our Lab I.D.			Method Blank	**55812.02**	**55812.03**	**55812.06**	**55812.08**
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Bromofluorobenzene	75-125		102	104	98.8	98.8	101
Dibromofluoromethane	75-125		101	102	100	99.7	101
Toluene-d8	75-125		110	103	101	104	102

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ANALYTICAL RESULTS

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0208102A1

Our Lab I.D.			Method Blank	55812.12	55812.13	55812.15	55812.16
Client Sample I.D.				GP9C-5	GP9C-10	GP9D-5	GP9D-12
Date Sampled				02/04/2010	02/04/2010	02/04/2010	02/04/2010
Date Prepared			02/08/2010	02/08/2010	02/08/2010	02/08/2010	02/08/2010
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			02/08/2010	02/08/2010	02/08/2010	02/08/2010	02/08/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	25	50	ND	ND	ND	ND	ND
Benzene	1.0	10.0	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND	ND	ND	ND
Bromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromodichloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	25	50	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	15	30	ND	ND	ND	ND	ND
2-Butanone (MEK)	25	50	ND	ND	ND	ND	ND
n-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Carbon Disulfide	25	50	ND	ND	ND	ND	ND
Carbon tetrachloride	5.0	10.0	ND	ND	ND	ND	ND
Chlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
Chloroethane	15	30	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50	50	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	5.0	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	15	30	ND	ND	ND	ND	ND
2-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	25	50	ND	ND	ND	ND	ND
Dibromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND	ND	ND	ND
Dibromomethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0208102A1

Our Lab I.D.			Method Blank	55812.12	55812.13	55812.15	55812.16
Client Sample I.D.				GP9C-5	GP9C-10	GP9D-5	GP9D-12
Date Sampled				02/04/2010	02/04/2010	02/04/2010	02/04/2010
Date Prepared			02/08/2010	02/08/2010	02/08/2010	02/08/2010	02/08/2010
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			02/08/2010	02/08/2010	02/08/2010	02/08/2010	02/08/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Dichlorodifluoromethane	15	30	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
Ethylbenzene	1.0	10.0	ND	ND	ND	ND	ND
Hexachlorobutadiene	15	30	ND	ND	ND	ND	ND
2-Hexanone	25	50	ND	ND	ND	ND	ND
Iodomethane	5.0	10.0	ND	ND	ND	ND	ND
Isopropylbenzene	5.0	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND	ND	ND	ND
Methylene chloride (DCM)	25	50	ND	ND	ND	ND	ND
Naphthalene	5.0	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Styrene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
Tetrachloroethene	5.0	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	1.0	10.0	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
Trichloroethene	5.0	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0208102A1

Our Lab I.D.			Method Blank	**55812.12**	**55812.13**	**55812.15**	**55812.16**
Client Sample I.D.				GP9C-5	GP9C-10	GP9D-5	GP9D-12
Date Sampled				02/04/2010	02/04/2010	02/04/2010	02/04/2010
Date Prepared			02/08/2010	02/08/2010	02/08/2010	02/08/2010	02/08/2010
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			02/08/2010	02/08/2010	02/08/2010	02/08/2010	02/08/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2,3-Trichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Vinyl Acetate	25	50	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	15	30	ND	ND	ND	ND	ND
o-Xylene	1.0	10.0	ND	ND	ND	ND	ND
m,p-Xylenes	1.0	20.0	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	**55812.12**	**55812.13**	**55812.15**	**55812.16**
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Bromofluorobenzene	75-125		104	103	101	99.8	99.7
Dibromofluoromethane	75-125		101	103	103	104	102
Toluene-d8	75-125		105	105	104	105	103

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ANALYTICAL RESULTS

Ordered By

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Attn: William Ragsdale
Page: 8

Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0208102A1

Our Lab I.D.			55812.19	55812.20	55812.22	55812.23	
Client Sample I.D.			GP9E-5	GP9E-10	GP9F-1	GP9F-5	
Date Sampled			02/04/2010	02/04/2010	02/04/2010	02/04/2010	
Date Prepared			02/08/2010	02/08/2010	02/08/2010	02/08/2010	
Preparation Method			5035A	5035A	5035A	5035A	
Date Analyzed			02/08/2010	02/08/2010	02/08/2010	02/08/2010	
Matrix			Soil	Soil	Soil	Soil	
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
Acetone	25	50	ND	ND	ND	ND	
Benzene	1.0	10.0	ND	ND	ND	ND	
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND	ND	ND	
Bromochloromethane	5.0	10.0	ND	ND	ND	ND	
Bromodichloromethane	5.0	10.0	ND	ND	ND	ND	
Bromoform (Tribromomethane)	25	50	ND	ND	ND	ND	
Bromomethane (Methyl bromide)	15	30	ND	ND	ND	ND	
2-Butanone (MEK)	25	50	ND	ND	ND	ND	
n-Butylbenzene	5.0	10.0	ND	ND	ND	ND	
sec-Butylbenzene	5.0	10.0	ND	ND	ND	ND	
tert-Butylbenzene	5.0	10.0	ND	ND	ND	ND	
Carbon Disulfide	25	50	ND	ND	ND	ND	
Carbon tetrachloride	5.0	10.0	ND	ND	ND	ND	
Chlorobenzene	5.0	10.0	ND	ND	ND	ND	
Chloroethane	15	30	ND	ND	ND	ND	
2-Chloroethyl vinyl ether	50	50	ND	ND	ND	ND	
Chloroform (Trichloromethane)	5.0	10.0	ND	ND	ND	ND	
Chloromethane (Methyl chloride)	15	30	ND	ND	ND	ND	
2-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	
4-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	
1,2-Dibromo-3-chloropropane (DBCP)	25	50	ND	ND	ND	ND	
Dibromochloromethane	5.0	10.0	ND	ND	ND	ND	
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND	ND	ND	
Dibromomethane	5.0	10.0	ND	ND	ND	ND	
1,2-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	
1,3-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	
1,4-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0208102A1

Our Lab I.D.			55812.19	55812.20	55812.22	55812.23	
Client Sample I.D.			GP9E-5	GP9E-10	GP9F-1	GP9F-5	
Date Sampled			02/04/2010	02/04/2010	02/04/2010	02/04/2010	
Date Prepared			02/08/2010	02/08/2010	02/08/2010	02/08/2010	
Preparation Method			5035A	5035A	5035A	5035A	
Date Analyzed			02/08/2010	02/08/2010	02/08/2010	02/08/2010	
Matrix			Soil	Soil	Soil	Soil	
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
Dichlorodifluoromethane	15	30	ND	ND	ND	ND	
1,1-Dichloroethane	5.0	10.0	ND	ND	ND	ND	
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND	ND	ND	
1,1-Dichloroethene	5.0	10.0	ND	ND	ND	ND	
cis-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	
trans-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	
1,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	
1,3-Dichloropropane	5.0	10.0	ND	ND	ND	ND	
2,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	
1,1-Dichloropropene	5.0	10.0	ND	ND	ND	ND	
cis-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	
trans-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	
Ethylbenzene	1.0	10.0	ND	ND	ND	ND	
Hexachlorobutadiene	15	30	ND	ND	ND	ND	
2-Hexanone	25	50	ND	ND	ND	ND	
Iodomethane	5.0	10.0	ND	ND	ND	ND	
Isopropylbenzene	5.0	10.0	ND	ND	ND	ND	
p-Isopropyltoluene	5.0	10.0	ND	ND	ND	ND	
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND	ND	ND	
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND	ND	ND	
Methylene chloride (DCM)	25	50	ND	ND	ND	ND	
Naphthalene	5.0	10.0	ND	ND	ND	ND	
n-Propylbenzene	5.0	10.0	ND	ND	ND	ND	
Styrene	5.0	10.0	ND	ND	ND	ND	
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	
Tetrachloroethene	5.0	10.0	ND	ND	ND	ND	
Toluene (Methyl benzene)	1.0	10.0	ND	ND	ND	ND	
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	
1,1,1-Trichloroethane	5.0	10.0	ND	ND	ND	ND	
1,1,2-Trichloroethane	5.0	10.0	ND	ND	ND	ND	
Trichloroethene	5.0	10.0	ND	ND	ND	ND	
Trichlorofluoromethane	5.0	10.0	ND	ND	ND	ND	

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0208102A1

Our Lab I.D.			55812.19	55812.20	55812.22	55812.23	
Client Sample I.D.			GP9E-5	GP9E-10	GP9F-1	GP9F-5	
Date Sampled			02/04/2010	02/04/2010	02/04/2010	02/04/2010	
Date Prepared			02/08/2010	02/08/2010	02/08/2010	02/08/2010	
Preparation Method			5035A	5035A	5035A	5035A	
Date Analyzed			02/08/2010	02/08/2010	02/08/2010	02/08/2010	
Matrix			Soil	Soil	Soil	Soil	
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
1,2,3-Trichloropropane	5.0	10.0	ND	ND	ND	ND	
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	
Vinyl Acetate	25	50	ND	ND	ND	ND	
Vinyl chloride (Chloroethene)	15	30	ND	ND	ND	ND	
o-Xylene	1.0	10.0	ND	ND	ND	ND	
m,p-Xylenes	1.0	20.0	ND	ND	ND	ND	
Our Lab I.D.			55812.19	55812.20	55812.22	55812.23	
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
Bromofluorobenzene	75-125		94.2	101	99.4	99.9	
Dibromofluoromethane	75-125		103	103	101	101	
Toluene-d8	75-125		101	100	99.8	101	

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 020510NB1

Our Lab I.D.			Method Blank	**55812.12**	**55812.13**		
Client Sample I.D.				GP9C-5	GP9C-10		
Date Sampled				02/04/2010	02/04/2010		
Date Prepared			02/05/2010	02/05/2010	02/05/2010		
Preparation Method			5035A	5035A	5035A		
Date Analyzed			02/05/2010	02/05/2010	02/05/2010		
Matrix			Soil	Soil	Soil		
Units			mg/Kg	mg/Kg	mg/Kg		
Dilution Factor			1	1	1		
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**		
TPH as Gasoline and Light HC. (C4-C12)	0.100	1.000	ND	ND	ND		
Our Lab I.D.			Method Blank	**55812.12**	**55812.13**		
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**		
Bromofluorobenzene	75-125		106	102	97.2		

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 020810DB1

Our Lab I.D.			Method Blank				
Client Sample I.D.							
Date Sampled							
Date Prepared			02/08/2010				
Preparation Method			3550B				
Date Analyzed			02/08/2010				
Matrix			Soil				
Units			mg/Kg				
Dilution Factor			1				
Analytes	**MDL**	**PQL**	**Results**				
TPH as Diesel (C13-C22)	1.0	5.0	ND				
TPH as Heavy Hydrocarbons (C23-C40)	1.0	5.0	ND				
TPH Total as Diesel and Heavy HC.C13-C40	1.0	5.0	ND				
Our Lab I.D.			Method Blank				
Surrogates	**%Rec.Limit**		**% Rec.**				
Chlorobenzene	75-125		94.9				

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 020810DB1

Our Lab I.D.			**55812.12**				
Client Sample I.D.			GP9C-5				
Date Sampled			02/04/2010				
Date Prepared			02/08/2010				
Preparation Method			3550B				
Date Analyzed			02/08/2010				
Matrix			Soil				
Units			mg/Kg				
Dilution Factor			2				
Analytes	**MDL**	**PQL**	**Results**				
TPH as Diesel (C13-C22)	2.0	10	1,530				
TPH as Heavy Hydrocarbons (C23-C40)	2.0	10	7,990				
TPH Total as Diesel and Heavy HC.C13-C40	2.0	10	9,520				
Our Lab I.D.			**55812.12**				
Surrogates	**%Rec.Limit**		**% Rec.**				
Chlorobenzene	75-125		98.8				

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 020810DB1

Our Lab I.D.			**55812.13**				
Client Sample I.D.			GP9C-10				
Date Sampled			02/04/2010				
Date Prepared			02/08/2010				
Preparation Method			3550B				
Date Analyzed			02/08/2010				
Matrix			Soil				
Units			mg/Kg				
Dilution Factor			10				
Analytes	**MDL**	**PQL**	**Results**				
TPH as Diesel (C13-C22)	10	50	4,150				
TPH as Heavy Hydrocarbons (C23-C40)	10	50	29,500				
TPH Total as Diesel and Heavy HC.C13-C40	10	50	33,700				
Our Lab I.D.			**55812.13**				
Surrogates	**%Rec.Limit**		**% Rec.**				
Chlorobenzene	75-125		94.3				

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 021510KB1

Our Lab I.D.			Method Blank	55812.02	55812.03	55812.07	55812.08
Client Sample I.D.				GP9A-5	GP9A-10	GP9B-5	GP9B-10
Date Sampled				02/04/2010	02/04/2010	02/04/2010	02/04/2010
Date Prepared			02/15/2010	02/15/2010	02/15/2010	02/15/2010	02/15/2010
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			02/16/2010	02/16/2010	02/16/2010	02/16/2010	02/16/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acenaphthene	0.25	0.50	ND	ND	ND	ND	ND
Acenaphthylene	0.25	0.50	ND	ND	ND	ND	ND
Anthracene	0.25	0.50	ND	ND	ND	ND	ND
Azobenzene	0.25	0.50	ND	ND	ND	ND	ND
Benzidine	0.25	0.50	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.25	0.50	ND	ND	ND	ND	ND
Benzo(a)pyrene	0.25	0.50	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.25	0.50	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.25	0.50	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.25	0.50	ND	ND	ND	ND	ND
Benzoic Acid	0.25	0.50	ND	ND	ND	ND	ND
Benzyl Alcohol	0.25	0.50	ND	ND	ND	ND	ND
Bis(2-Chloroethoxy)methane	0.25	0.50	ND	ND	ND	ND	ND
Bis(2-Chloroethyl)ether	0.25	0.50	ND	ND	ND	ND	ND
Bis(2-chloroisopropyl) ether	0.25	0.50	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	0.25	0.50	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	0.25	0.50	ND	ND	ND	ND	ND
Butyl benzyl phthalate	0.25	0.50	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	0.25	0.50	ND	ND	ND	ND	ND
4-Chloroaniline	0.25	0.50	ND	ND	ND	ND	ND
2-Chloronaphthalene	0.25	0.50	ND	ND	ND	ND	ND
2-Chlorophenol	0.25	0.50	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether	0.25	0.50	ND	ND	ND	ND	ND
Chrysene	0.25	0.50	ND	ND	ND	ND	ND
Di-n-butyl phthalate	0.25	0.50	ND	ND	ND	ND	ND
Di-n-octyl phthalate (Dioctyl ester)	0.25	0.50	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	0.25	0.50	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 021510KB1

Our Lab I.D.			Method Blank	55812.02	55812.03	55812.07	55812.08
Client Sample I.D.				GP9A-5	GP9A-10	GP9B-5	GP9B-10
Date Sampled				02/04/2010	02/04/2010	02/04/2010	02/04/2010
Date Prepared			02/15/2010	02/15/2010	02/15/2010	02/15/2010	02/15/2010
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			02/16/2010	02/16/2010	02/16/2010	02/16/2010	02/16/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Dibenzofuran	0.25	0.50	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine	0.25	0.50	ND	ND	ND	ND	ND
2,4-Dichlorophenol	0.25	0.50	ND	ND	ND	ND	ND
Diethyl phthalate (Diethyl ester)	0.25	0.50	ND	ND	ND	ND	ND
Dimethyl phthalate (Dimethyl ester)	0.25	0.50	ND	ND	ND	ND	ND
2,4-Dimethylphenol	0.25	0.50	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	0.25	0.50	ND	ND	ND	ND	ND
2,4-Dinitrophenol	0.25	0.50	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	0.25	0.50	ND	ND	ND	ND	ND
2,6-Dinitrotoluene (2,6-DNT)	0.25	0.50	ND	ND	ND	ND	ND
Fluoranthene	0.25	0.50	ND	ND	ND	ND	ND
Fluorene	0.25	0.50	ND	ND	ND	ND	ND
Hexachlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.25	0.50	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	0.25	0.50	ND	ND	ND	ND	ND
Hexachloroethane	0.25	0.50	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	0.25	0.50	ND	ND	ND	ND	ND
Isophorone	0.25	0.50	ND	ND	ND	ND	ND
2-Methylnaphthalene	0.25	0.50	ND	ND	ND	ND	ND
4-Methylphenol	0.25	0.50	ND	ND	ND	ND	ND
2-Methylphenol (2-Cresol)	0.25	0.50	ND	ND	ND	ND	ND
3-Methylphenol (3-Cresol)	0.25	0.50	ND	ND	ND	ND	ND
N-Nitroso-Di-n-propylamine	0.25	0.50	ND	ND	ND	ND	ND
Naphthalene	0.25	0.50	ND	ND	ND	ND	ND
2-Nitroaniline	0.25	0.50	ND	ND	ND	ND	ND
3-Nitroaniline	0.25	0.50	ND	ND	ND	ND	ND
4-Nitroaniline	0.25	0.50	ND	ND	ND	ND	ND
Nitrobenzene (NB)	0.25	0.50	ND	ND	ND	ND	ND
4-Nitrophenol	0.25	0.50	ND	ND	ND	ND	ND
2-Nitrophenol (o-Nitrophenol)	0.25	0.50	ND	ND	ND	ND	ND
N-nitrosodiphenylamine	0.25	0.50	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 021510KB1

Our Lab I.D.			Method Blank	55812.02	55812.03	55812.07	55812.08
Client Sample I.D.				GP9A-5	GP9A-10	GP9B-5	GP9B-10
Date Sampled				02/04/2010	02/04/2010	02/04/2010	02/04/2010
Date Prepared			02/15/2010	02/15/2010	02/15/2010	02/15/2010	02/15/2010
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			02/16/2010	02/16/2010	02/16/2010	02/16/2010	02/16/2010
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Pentachlorophenol	0.25	0.50	ND	ND	ND	ND	ND
Phenanthrene	0.25	0.50	ND	ND	ND	ND	ND
Phenol	0.25	0.50	ND	ND	ND	ND	ND
Pyrene	0.25	0.50	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	0.25	0.50	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	0.25	0.50	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	55812.02	55812.03	55812.07	55812.08
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
2-Fluorophenol	25-121		72.8	62.0	60.0	60.8	62.8
2-Fluorobiphenyl	30-115		80.8	75.2	72.4	75.2	70.8
Nitrobenzene-d5	23-120		76.0	68.0	66.8	68.0	67.2
Phenol-d6	21-113		73.6	63.6	62.0	61.4	62.8
p-Terphenyl-D14	18-137		85.6	74.8	70.8	75.6	71.6
2,4,6-Tribromophenol	19-122		89.2	79.6	77.8	80.8	76.8

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 020910

Our Lab I.D.			Method Blank				
Client Sample I.D.							
Date Sampled							
Date Prepared			02/09/2010				
Preparation Method			3550B				
Date Analyzed			02/12/2010				
Matrix			Soil				
Units			mg/Kg				
Dilution Factor			1				
Analytes	**MDL**	**PQL**	**Results**				
Acenaphthene	0.25	0.50	ND				
Acenaphthylene	0.25	0.50	ND				
Anthracene	0.25	0.50	ND				
Azobenzene	0.25	0.50	ND				
Benzidine	0.25	0.50	ND				
Benzo(a)anthracene	0.25	0.50	ND				
Benzo(a)pyrene	0.25	0.50	ND				
Benzo(b)fluoranthene	0.25	0.50	ND				
Benzo(g,h,i)perylene	0.25	0.50	ND				
Benzo(k)fluoranthene	0.25	0.50	ND				
Benzoic Acid	0.25	0.50	ND				
Benzyl Alcohol	0.25	0.50	ND				
Bis(2-Chloroethoxy)methane	0.25	0.50	ND				
Bis(2-Chloroethyl)ether	0.25	0.50	ND				
Bis(2-chloroisopropyl) ether	0.25	0.50	ND				
Bis(2-ethylhexyl) phthalate	0.25	0.50	ND				
4-Bromophenyl phenyl ether	0.25	0.50	ND				
Butyl benzyl phthalate	0.25	0.50	ND				
4-Chloro-3-methylphenol	0.25	0.50	ND				
4-Chloroaniline	0.25	0.50	ND				
2-Chloronaphthalene	0.25	0.50	ND				
2-Chlorophenol	0.25	0.50	ND				
4-Chlorophenyl phenyl ether	0.25	0.50	ND				
Chrysene	0.25	0.50	ND				
Di-n-butyl phthalate	0.25	0.50	ND				
Di-n-octyl phthalate (Dioctyl ester)	0.25	0.50	ND				
Dibenzo(a,h)anthracene	0.25	0.50	ND				

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 020910

Our Lab I.D.			Method Blank				
Client Sample I.D.							
Date Sampled							
Date Prepared			02/09/2010				
Preparation Method			3550B				
Date Analyzed			02/12/2010				
Matrix			Soil				
Units			mg/Kg				
Dilution Factor			1				
Analytes	**MDL**	**PQL**	**Results**				
Dibenzofuran	0.25	0.50	ND				
1,2-Dichlorobenzene	0.25	0.50	ND				
1,3-Dichlorobenzene	0.25	0.50	ND				
1,4-Dichlorobenzene	0.25	0.50	ND				
3,3'-Dichlorobenzidine	0.25	0.50	ND				
2,4-Dichlorophenol	0.25	0.50	ND				
Diethyl phthalate (Diethyl ester)	0.25	0.50	ND				
Dimethyl phthalate (Dimethyl ester)	0.25	0.50	ND				
2,4-Dimethylphenol	0.25	0.50	ND				
4,6-Dinitro-2-methylphenol	0.25	0.50	ND				
2,4-Dinitrophenol	0.25	0.50	ND				
2,4-Dinitrotoluene	0.25	0.50	ND				
2,6-Dinitrotoluene (2,6-DNT)	0.25	0.50	ND				
Fluoranthene	0.25	0.50	ND				
Fluorene	0.25	0.50	ND				
Hexachlorobenzene	0.25	0.50	ND				
Hexachlorobutadiene	0.25	0.50	ND				
Hexachlorocyclopentadiene	0.25	0.50	ND				
Hexachloroethane	0.25	0.50	ND				
Indeno(1,2,3-cd)pyrene	0.25	0.50	ND				
Isophorone	0.25	0.50	ND				
2-Methylnaphthalene	0.25	0.50	ND				
4-Methylphenol	0.25	0.50	ND				
2-Methylphenol (2-Cresol)	0.25	0.50	ND				
3-Methylphenol (3-Cresol)	0.25	0.50	ND				
N-Nitroso-Di-n-propylamine	0.25	0.50	ND				
Naphthalene	0.25	0.50	ND				
2-Nitroaniline	0.25	0.50	ND				
3-Nitroaniline	0.25	0.50	ND				
4-Nitroaniline	0.25	0.50	ND				
Nitrobenzene (NB)	0.25	0.50	ND				
4-Nitrophenol	0.25	0.50	ND				
2-Nitrophenol (o-Nitrophenol)	0.25	0.50	ND				
N-nitrosodiphenylamine	0.25	0.50	ND				

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 020910

Our Lab I.D.			Method Blank				
Client Sample I.D.							
Date Sampled							
Date Prepared			02/09/2010				
Preparation Method			3550B				
Date Analyzed			02/12/2010				
Matrix			Soil				
Units			mg/Kg				
Dilution Factor			1				
Analytes	**MDL**	**PQL**	**Results**				
Pentachlorophenol	0.25	0.50	ND				
Phenanthrene	0.25	0.50	ND				
Phenol	0.25	0.50	ND				
Pyrene	0.25	0.50	ND				
1,2,4-Trichlorobenzene	0.25	0.50	ND				
2,4,5-Trichlorophenol	0.25	0.50	ND				
2,4,6-Trichlorophenol	0.25	0.50	ND				
Our Lab I.D.			Method Blank				
Surrogates	**%Rec.Limit**		**% Rec.**				
2-Fluorophenol	25-121		46.6				
2-Fluorobiphenyl	30-115		66.0				
Nitrobenzene-d5	23-120		58.0				
Phenol-d6	21-113		52.6				
p-Terphenyl-D14	18-137		84.4				
2,4,6-Tribromophenol	19-122		78.2				

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Arrow Hwy
Irwindale, CA

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Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 020910

Our Lab I.D.			55812.12	55812.13			
Client Sample I.D.			GP9C-5	GP9C-10			
Date Sampled			02/04/2010	02/04/2010			
Date Prepared			02/09/2010	02/09/2010			
Preparation Method			3550B	3550B			
Date Analyzed			02/12/2010	02/12/2010			
Matrix			Soil	Soil			
Units			mg/Kg	mg/Kg			
Dilution Factor			100	100			
Analytes	**MDL**	**PQL**	**Results**	**Results**			
Acenaphthene	25	50	ND	ND			
Acenaphthylene	25	50	ND	ND			
Anthracene	25	50	ND	ND			
Azobenzene	25	50	ND	ND			
Benzidine	25	50	ND	ND			
Benzo(a)anthracene	25	50	ND	ND			
Benzo(a)pyrene	25	50	ND	ND			
Benzo(b)fluoranthene	25	50	ND	ND			
Benzo(g,h,i)perylene	25	50	ND	ND			
Benzo(k)fluoranthene	25	50	ND	ND			
Benzoic Acid	25	50	ND	ND			
Benzyl Alcohol	25	50	ND	ND			
Bis(2-Chloroethoxy)methane	25	50	ND	ND			
Bis(2-Chloroethyl)ether	25	50	ND	ND			
Bis(2-chloroisopropyl) ether	25	50	ND	ND			
Bis(2-ethylhexyl) phthalate	25	50	ND	ND			
4-Bromophenyl phenyl ether	25	50	ND	ND			
Butyl benzyl phthalate	25	50	ND	ND			
4-Chloro-3-methylphenol	25	50	ND	ND			
4-Chloroaniline	25	50	ND	ND			
2-Chloronaphthalene	25	50	ND	ND			
2-Chlorophenol	25	50	ND	ND			
4-Chlorophenyl phenyl ether	25	50	ND	ND			
Chrysene	25	50	ND	ND			
Di-n-butyl phthalate	25	50	ND	ND			
Di-n-octyl phthalate (Dioctyl ester)	25	50	ND	ND			
Dibenzo(a,h)anthracene	25	50	ND	ND			

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 020910

Our Lab I.D.			55812.12	55812.13			
Client Sample I.D.			GP9C-5	GP9C-10			
Date Sampled			02/04/2010	02/04/2010			
Date Prepared			02/09/2010	02/09/2010			
Preparation Method			3550B	3550B			
Date Analyzed			02/12/2010	02/12/2010			
Matrix			Soil	Soil			
Units			mg/Kg	mg/Kg			
Dilution Factor			100	100			
Analytes	**MDL**	**PQL**	**Results**	**Results**			
Dibenzofuran	25	50	ND	ND			
1,2-Dichlorobenzene	25	50	ND	ND			
1,3-Dichlorobenzene	25	50	ND	ND			
1,4-Dichlorobenzene	25	50	ND	ND			
3,3'-Dichlorobenzidine	25	50	ND	ND			
2,4-Dichlorophenol	25	50	ND	ND			
Diethyl phthalate (Diethyl ester)	25	50	ND	ND			
Dimethyl phthalate (Dimethyl ester)	25	50	ND	ND			
2,4-Dimethylphenol	25	50	ND	ND			
4,6-Dinitro-2-methylphenol	25	50	ND	ND			
2,4-Dinitrophenol	25	50	ND	ND			
2,4-Dinitrotoluene	25	50	ND	ND			
2,6-Dinitrotoluene (2,6-DNT)	25	50	ND	ND			
Fluoranthene	25	50	ND	ND			
Fluorene	25	50	ND	ND			
Hexachlorobenzene	25	50	ND	ND			
Hexachlorobutadiene	25	50	ND	ND			
Hexachlorocyclopentadiene	25	50	ND	ND			
Hexachloroethane	25	50	ND	ND			
Indeno(1,2,3-cd)pyrene	25	50	ND	ND			
Isophorone	25	50	ND	ND			
2-Methylnaphthalene	25	50	ND	ND			
4-Methylphenol	25	50	ND	ND			
2-Methylphenol (2-Cresol)	25	50	ND	ND			
3-Methylphenol (3-Cresol)	25	50	ND	ND			
N-Nitroso-Di-n-propylamine	25	50	ND	ND			
Naphthalene	25	50	ND	ND			
2-Nitroaniline	25	50	ND	ND			
3-Nitroaniline	25	50	ND	ND			
4-Nitroaniline	25	50	ND	ND			
Nitrobenzene (NB)	25	50	ND	ND			
4-Nitrophenol	25	50	ND	ND			
2-Nitrophenol (o-Nitrophenol)	25	50	ND	ND			
N-nitrosodiphenylamine	25	50	ND	ND			

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 020910

Our Lab I.D.			55812.12	55812.13			
Client Sample I.D.			GP9C-5	GP9C-10			
Date Sampled			02/04/2010	02/04/2010			
Date Prepared			02/09/2010	02/09/2010			
Preparation Method			3550B	3550B			
Date Analyzed			02/12/2010	02/12/2010			
Matrix			Soil	Soil			
Units			mg/Kg	mg/Kg			
Dilution Factor			100	100			
Analytes	**MDL**	**PQL**	**Results**	**Results**			
Pentachlorophenol	25	50	ND	ND			
Phenanthrene	25	50	ND	ND			
Phenol	25	50	ND	ND			
Pyrene	25	50	ND	ND			
1,2,4-Trichlorobenzene	25	50	ND	ND			
2,4,5-Trichlorophenol	25	50	ND	ND			
2,4,6-Trichlorophenol	25	50	ND	ND			

Comment(s):
55812.12: Analyzed under dilution due to matrix interference 55812.13: Analyzed under dilution due to matrix interference

Our Lab I.D.			55812.12	55812.13			
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**			
2-Fluorophenol	25-121		59.2	63.2			
2-Fluorobiphenyl	30-115		90.0	88.8			
Nitrobenzene-d5	23-120		78.0	66.8			
Phenol-d6	21-113		58.0	64.0			
p-Terphenyl-D14	18-137		90.4	65.6			
2,4,6-Tribromophenol	19-122		42.4	68.0			

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0205102A1; Dup or Spiked Sample: B0205102A1; LCS: Clean Sand; QC Prepared: 02/05/2010; QC Analyzed: 02/05/2010; Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.00	50.0	48.5 X	97.0	50.0	47.0 X	94.0	3.1	75-125	<20
Chlorobenzene	0.00	50.0	51.0 X	102	50.0	49.0 X	98.0	4.0	75-125	<20
1,1-Dichloroethene	0.00	50.0	51.5 X	103	50.0	49.5 X	99.0	4.0	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.00	50.0	49.2 X	98.4	50.0	49.0 X	98.0	<1	75-125	<20
Toluene (Methyl benzene)	0.00	50.0	50.0 X	100	50.0	47.5 X	95.0	5.1	75-125	<20
Trichloroethene	0.00	50.0	52.0 X	104	50.0	48.5 X	97.0	7.0	75-125	<20
LCS										
Chloroform (Trichloromethane)	0.00	50.0	52.5 X	105	50.0	51.5 X	103	1.9	75-125	<20
Ethylbenzene	0.00	50.0	50.5 X	101	50.0	48.0 X	96.0	5.1	75-125	<20
1,1,1-Trichloroethane	0.00	50.0	50.5 X	101	50.0	50.0 X	100	<1	75-125	<20
o-Xylene	0.00	50.0	51.0 X	102	50.0	49.0 X	98.0	4.0	75-125	<20
m,p-Xylenes	0.00	100	100 X	100	100	97.0 X	97.0	3.0	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	50.0	51.5 X	103	50.0	47.8 X	95.6	7.5	75-125	<20
Dibromofluoromethane	0.00	50.0	49.6 X	99.2	50.0	50.5 X	101	1.8	75-125	<20
Toluene-d8	0.00	50.0	49.2 X	98.3	50.0	48.0 X	95.9	2.5	75-125	<20

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Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0208102A1; Dup or Spiked Sample: B0208102A1; LCS: Clean Sand; QC Prepared: 02/08/2010; QC Analyzed: 02/08/2010; Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.00	50.0	48.8	97.6	50.0	48.2	96.4	1.24	75-125	<20
Chlorobenzene	0.00	50.0	49.9	99.8	50.0	50.5	101	1.20	75-125	<20
1,1-Dichloroethene	0.00	50.0	53.0	106	50.0	52.5	105	<1	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.00	50.0	48.0	96.0	50.0	48.3	96.6	<1	75-125	<20
Toluene (Methyl benzene)	0.00	50.0	48.3	96.6	50.0	48.0	96.0	<1	75-125	<20
Trichloroethene	0.00	50.0	51.5	103	50.0	51.0	102	<1	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	50.0	50.0	100	50.0	49.0	98.0	2.00	75-125	<20
Dibromofluoromethane	0.00	50.0	49.9	99.7	50.0	50.5	101	1.30	75-125	<20
Toluene-d8	0.00	50.0	48.9	97.7	50.0	48.5	97.0	<1	75-125	<20

QC Batch No: 0208102A1; Dup or Spiked Sample: B0208102A1; LCS: Clean Sand; QC Prepared: 02/08/2010; QC Analyzed: 02/08/2010; Units: ug/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Benzene	50.0	49.1	98.2	75-125						
Chlorobenzene	50.0	49.8	99.6	75-125						
1,1-Dichloroethene	50.0	53.8	108	75-125						
Methyl-tert-butyl ether (MTBE)	50.0	48.2	96.4	75-125						
Toluene (Methyl benzene)	50.0	48.0	96.0	75-125						
Trichloroethene	50.0	49.6	99.2	75-125						
LCS										
Chloroform (Trichloromethane)	50.0	52.9	106	75-125						
Ethylbenzene	50.0	49.3	98.6	75-125						
1,1,1-Trichloroethane	50.0	50.3	101	75-125						
o-Xylene	50.0	49.3	98.6	75-125						
m,p-Xylenes	100	96.6	96.6	75-125						
Surrogates										
Bromofluorobenzene	50.0	51.2	102	75-125						
Dibromofluoromethane	50.0	50.2	100	75-125						
Toluene-d8	50.0	48.1	96.2	75-125						

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 020910; Dup or Spiked Sample: 55779.01; LCS: Clean Sand; QC Prepared: 02/09/2010; QC Analyzed: 02/12/2010; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Acenaphthene	0.00	5.00	3.82	76.4	5.00	3.85	77.0	<1	46-118	<20
4-Chloro-3-methylphenol	0.00	10.0	7.70	77.0	10.0	8.15	81.5	5.7	39-98	<20
2-Chlorophenol	0.00	10.0	6.91	69.1	10.0	7.21	72.1	4.2	27-123	<20
1,4-Dichlorobenzene	0.00	5.00	3.38	67.6	5.00	3.50	70.0	3.5	36-97	<20
2,4-Dinitrotoluene	0.00	5.00	3.95	79.0	5.00	3.95	79.0	<1	24-96	<20
N-Nitroso-Di-n-propylamine	0.00	5.00	3.97	79.4	5.00	4.11	82.2	3.5	41-116	<20
4-Nitrophenol	0.00	10.0	7.77	77.7	10.0	8.71	87.1	11.4	10-90	<20
Pentachlorophenol	0.00	10.0	9.30	93.0	10.0	10.3	103	10.2	40-125	<20
Phenol	0.00	10.0	7.05	70.5	10.0	7.32	73.2	3.8	12-89	<20
Pyrene	0.00	5.00	3.91	78.2	5.00	3.96	79.2	1.3	26-127	<20
1,2,4-Trichlorobenzene	0.00	5.00	3.61	72.2	5.00	3.76	75.2	4.1	39-98	<20
Surrogates										
2-Fluorophenol	0.00	2.50	1.57	62.8	2.50	1.64	65.4	4.1	25-121	<20
2-Fluorobiphenyl	0.00	2.50	1.92	76.8	2.50	1.91	76.4	<1	30-115	<20
Nitrobenzene-d5	0.00	2.50	1.81	72.4	2.50	1.87	74.8	3.3	23-120	<20
p-Terphenyl-D14	0.00	5.00	3.78	75.6	5.00	4.00	80.0	5.7	18-137	<20
Phenol-d6	0.00	5.00	3.40	68.0	5.00	3.50	70.0	2.9	24-113	<20
2,4,6-Tribromophenol	0.00	5.00	4.07	81.4	5.00	4.32	86.4	6.0	19-122	<20

QC Batch No: 020910; Dup or Spiked Sample: 55779.01; LCS: Clean Sand; QC Prepared: 02/09/2010; QC Analyzed: 02/12/2010; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Acenaphthene	5.00	3.97	79.4	31-137						
4-Chloro-3-methylphenol	10.0	8.33	83.3	40-99						
2-Chlorophenol	10.0	7.39	73.9	25-102						
1,4-Dichlorobenzene	5.00	3.63	72.6	28-104						
2,4-Dinitrotoluene	5.00	4.19	83.8	28-89						
N-Nitroso-Di-n-propylamine	5.00	4.21	84.2	41-126						
4-Nitrophenol	10.0	9.44	94.4	11-114						
Pentachlorophenol	10.0	10.4	104	17-125						

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QUALITY CONTROL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 020910; Dup or Spiked Sample: 55779.01; LCS: Clean Sand; QC Prepared: 02/09/2010; QC Analyzed: 02/12/2010; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Phenol	10.0	7.55	75.5	26-90						
Pyrene	5.00	3.99	79.8	35-142						
1,2,4-Trichlorobenzene	5.00	3.94	78.8	38-107						
Surrogates										
2-Fluorophenol	2.50	1.80	72.0	25-121						
2-Fluorobiphenyl	2.50	2.15	86.0	30-115						
Nitrobenzene-d5	2.50	2.08	83.2	23-120						
p-Terphenyl-D14	5.00	4.12	82.4	18-137						
Phenol-d6	5.00	3.90	78.0	24-113						
2,4,6-Tribromophenol	5.00	4.64	92.8	19-122						

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QUALITY CONTROL RESULTS

Ordered By

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Attn: William Ragsdale
Page: **28**

Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 021510KB1; Dup or Spiked Sample: 55913.01; LCS: Clean Sand; QC Prepared: 02/15/2010; QC Analyzed: 02/15/2010; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Acenaphthene	0.00	5.00	3.43	68.6	5.00	3.40	68.0	<1	46-118	<20
4-Chloro-3-methylphenol	0.00	10.0	7.19	71.9	10.0	7.03	70.3	2.3	39-98	<20
2-Chlorophenol	0.00	10.0	6.08	60.8	10.0	6.27	62.7	3.1	27-123	<20
1,4-Dichlorobenzene	0.00	5.00	3.06	61.2	5.00	3.08	61.6	<1	36-97	<20
2,4-Dinitrotoluene	0.00	5.00	3.31	66.2	5.00	3.38	67.6	2.1	24-96	<20
N-Nitroso-Di-n-propylamine	0.00	5.00	3.48	69.6	5.00	3.63	72.6	4.2	41-116	<20
4-Nitrophenol	0.00	10.0	6.29	62.9	10.0	6.86	68.6	8.7	10-80	<20
Pentachlorophenol	0.00	10.0	7.62	76.2	10.0	8.18	81.8	7.1	40-125	<20
Phenol	0.00	10.0	6.15	61.5	10.0	6.10	61.0	<1	12-89	<20
Pyrene	0.00	5.00	3.58	71.6	5.00	3.58	71.6	<1	26-127	<20
1,2,4-Trichlorobenzene	0.00	5.00	3.23	64.6	5.00	3.26	65.2	<1	39-98	<20
Surrogates										
2-Fluorophenol	0.00	5.00	2.70	54.0	5.00	2.69	53.8	<1	25-121	<20
2-Fluorobiphenyl	0.00	2.50	1.67	66.8	2.50	1.63	65.2	2.4	30-115	<20
Nitrobenzene-d5	0.00	2.50	1.52	60.8	2.50	1.50	60.0	1.3	23-120	<20
p-Terphenyl-D14	0.00	2.50	1.67	66.8	2.50	1.67	66.8	<1	18-137	<20
Phenol-d6	0.00	5.00	2.94	58.8	5.00	2.88	57.6	2.1	24-113	<20
2,4,6-Tribromophenol	0.00	5.00	3.64	72.8	5.00	3.47	69.4	4.8	19-122	<20

QC Batch No: 021510KB1; Dup or Spiked Sample: 55913.01; LCS: Clean Sand; QC Prepared: 02/15/2010; QC Analyzed: 02/15/2010; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Acenaphthene	5.00	3.91	78.2	31-137						
4-Chloro-3-methylphenol	10.0	8.29	82.9	40-99						
2-Chlorophenol	10.0	7.17	71.7	25-102						
1,4-Dichlorobenzene	5.00	3.54	70.8	28-104						
2,4-Dinitrotoluene	5.00	3.84	76.8	28-89						
N-Nitroso-Di-n-propylamine	5.00	4.12	82.4	41-126						
4-Nitrophenol	10.0	8.44	84.4	11-114						
Pentachlorophenol	10.0	10.1	101	17-125						

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QUALITY CONTROL RESULTS

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 021510KB1; Dup or Spiked Sample: 55913.01; LCS: Clean Sand; QC Prepared: 02/15/2010; QC Analyzed: 02/15/2010; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Phenol	10.0	7.24	72.4	26-90						
Pyrene	5.00	3.96	79.2	35-142						
1,2,4-Trichlorobenzene	5.00	3.84	76.8	38-107						
Surrogates										
2-Fluorophenol	5.00	3.13	62.6	25-121						
2-Fluorobiphenyl	2.50	1.95	78.0	30-115						
Nitrobenzene-d5	2.50	1.84	73.6	23-120						
p-Terphenyl-D14	2.50	1.88	75.2	18-137						
Phenol-d6	5.00	3.49	69.8	24-113						
2,4,6-Tribromophenol	5.00	4.16	83.2	19-122						

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QUALITY CONTROL RESULTS

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Attn: William Ragsdale
Page: **30**

Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 020810DB1; Dup or Spiked Sample: 2542.01; LCS: Clean Sand; QC Prepared: 02/08/2010; QC Analyzed: 02/08/2010; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
TPH as Diesel (C13-C22)	0.00	500	433	86.6	500	431	86.2	<1	75-125	<20
Surrogates										
Chlorobenzene	0.00	100	88.2	88.2	100	87.6	87.6	<1	75-125	<20

QC Batch No: 020810DB1; Dup or Spiked Sample: 2542.01; LCS: Clean Sand; QC Prepared: 02/08/2010; QC Analyzed: 02/08/2010; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
TPH as Diesel (C13-C22)	500	457	91.4	75-125						
Surrogates										
Chlorobenzene	100	93.7	93.7	75-125						

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QUALITY CONTROL RESULTS

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Site

Arrow Hwy
Irwindale, CA

Project ID: 09-42-138-02
Project Name: City of Irwindale

AETL Job Number	Submitted	Client
55812	02/05/2010	CONVRS

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 020510NB1; Dup or Spiked Sample: 55810.01A; LCS: Clean Sand; QC Prepared: 02/05/2010; QC Analyzed: 02/05/2010; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
TPH as Gasoline and Light HC. (C4-C12)	0.00	2.50	2.50	99.8	2.50	2.58	103	3.16	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	0.0500	0.0510	102	0.0500	0.0520	104	1.96	75-125	<20

QC Batch No: 020510NB1; Dup or Spiked Sample: 55810.01A; LCS: Clean Sand; QC Prepared: 02/05/2010; QC Analyzed: 02/05/2010; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
TPH as Gasoline and Light HC. (C4-C12)	2.50	2.47	98.8	75-125						
Surrogates										
Bromofluorobenzene	0.0500	0.0550	110	75-125						

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Data Qualifiers and Descriptors

Data Qualifier:

*:	In the QC section, sample results have been taken directly from the ICP reading. No preparation factor has been applied.
B:	Analyte was present in the Method Blank.
D:	Result is from a diluted analysis.
E:	Result is beyond calibration limits and is estimated.
H:	Analysis was performed over the allowed holding time due to circumstances which were beyond laboratory control.
J:	Analyte was detected . However, the analyte concentration is an estimated value, which is between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL).
M:	Matrix spike recovery is outside control limits due to matrix interference. Laboratory Control Sample recovery was acceptable.
MCL:	Maximum Contaminant Level
NS:	No Standard Available
S6:	Surrogate recovery is outside control limits due to matrix interference.
S8:	The analysis of the sample required a dilution such that the surrogate concentration was diluted below the method acceptance criteria.
X:	Results represent LCS and LCSD data.

Definition:

%Limi:	Percent acceptable limits.
%REC:	Percent recovery.
Con.L:	Acceptable Control Limits
Conce:	Added concentration to the sample.
LCS:	Laboratory Control Sample
MDL:	Method Detection Limit is a statistically derived number which is specific for each instrument, each method, and each compound. It indicates a distinctively detectable quantity with 99% probability.

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Data Qualifiers and Descriptors

MS:	Matrix Spike
MS DU:	Matrix Spike Duplicate
ND:	Analyte was not detected in the sample at or above MDL.
PQL:	Practical Quantitation Limit or ML (Minimum Level as per RWQCB) is the minimum concentration that can be quantified with more than 99% confidence. Taking into account all aspects of the entire analytical instrumentation and practice.
Recov:	Recovered concentration in the sample.
RPD:	Relative Percent Difference

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Attention: William Ragsdale

Number of Pages	**33**
Date Received	**12/18/2009**
Date Reported	**12/30/2009**

Job Number	Order Date	Client
55293	12/18/2009	CONVRS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot
Site: 14041 Live Oak Avenue
Irwindale, CA 91706

Enclosed please find results of analyses of 12 soil samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Checked By: _____ Approved By: C. Razmara

Cyrus Razmara, Ph.D.
Laboratory Director

American Environmental Testing Laboratory Inc.

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CHAIN OF CUSTODY RECORD

№ 67339

AETL JOB No. 55293

COMPANY	Converse Consultants
PROJECT MANAGER	William Ragsdale
COMPANY ADDRESS	185 E. Parkcrest Ave Costa Mesa CA
PHONE	714-444-9660
FAX	714-444-9640
PROJECT NAME	17 Acre Lot
PROJECT #	09-42-138-02
SITE NAME AND ADDRESS	14041 Live Oak Ave Irwindale CA
PO #	

	SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
1	GP1 - 1	55293.01	12/11/09	9:47	SOIL	4 VOAs ISCOOLE	ICE
2	5	55293.02		9:50			
3	10	55293.03		9:56			
4	15	55293.04		10:07			
5	GP3 - 1	55293.05		11:24			
6	5	55293.06		11:34			
7	10	55293.07		11:41			
8	15	55293.08		11:45			
9	GP7 - 1	55293.09		12:15			
10	5	55293.10		12:20			
11	10	55293.11		12:25			
12	15	55293.12		12:30			
13	GP8 - 1	55293.13		13:12			
14	5	55293.14		13:54			
15	10	55293.15		14:05			

ANALYSIS REQUESTED

	8015 CC	6010 Metals	8260 VOC's	8270 SVOC's	Archive
1					X
2	X	X	X	X	
3	X	X	X		
4					X
5	X	X	X		X
6	X	X	X	X	
7					X
8	X	X	X		
9					X
10	X	X	X	X	
11	X	X	X		
12					
13					X
14	X	X	X	X	
15					X

TEST INSTRUCTIONS & COMMENTS

1 ARCHIVE
4 ARCHIVE
5 ARCHIVE
7 ARCHIVE
13 ARCHIVE
15 ARCHIVE

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS	75	PROPERLY COOLED Y / N / NA	
CUSTODY SEALS Y / N / NA		SAMPLES INTACT Y / N / NA	
RECEIVED IN GOOD COND. Y / N		SAMPLES ACCEPTED Y / N	

TURN AROUND TIME

☒ NORMAL ☐ RUSH ☐ SAME DAY ☐ NEXT DAY ☐ 2 DAYS ☐ 3 DAYS

	1.	2.	3.
RELINQUISHED BY SAMPLER:	Signature:	Signature:	Signature:
	Printed Name: W. Ragsdale	Printed Name:	Printed Name: Chris Gonzales
	Date: 12/18/09 Time: 0740	Date: Time:	Date: 12/18/09 Time: 0840
RECEIVED BY:	Signature:	Signature:	Signature:
	Printed Name: Chris Gonzales	Printed Name:	Printed Name: Sean Claude
	Date: 12/18/09 Time: 0741	Date: Time:	Date: 12/18/09 Time: 0840

RECEIVED BY LABORATORY: AETL

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator

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CHAIN OF CUSTODY RECORD

№ 67340

AETL JOB No. 55293

COMPANY | PROJECT MANAGER

COMPANY ADDRESS | PHONE | FAX

PROJECT NAME: SAME AS PAGE 1 | PROJECT #: 08-42-138.02

SITE NAME AND ADDRESS | PO #

	SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
1	GP8- 15	55293.16	12/17/09	14:20	SOIL	4VOA's 1s/sleeve	ICE
2	GP10- 1	55293.17		14:55			
3	5	55293.18		14:58			
4	10	55293.19		15:15			
5	15	55293.20		15:19			
6	GP6- 1	55293.21		15:40			
7	5	55293.22		15:45			
8	10	55293.23		15:55			
9	15	55293.24		15:58			
10							
11							
12							
13							
14							
15							

ANALYSIS REQUESTED

	8015 ee	6010 metal	8260 VOC's	8270 SVOC's		Archive				TEST INSTRUCTIONS & COMMENTS
1	X	X	X							
2				X		X				ARCHIVE
3	X	X	X	X						
4	X	X	X							
5				X		X				ARCHIVE
6	X	X	X							
7				X						
8	X	X	X	X						
9				X		X				ARCHIVE
10										
11										
12										
13										
14										
15										

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS	45	PROPERLY COOLED Y / N / NA	
CUSTODY SEALS Y / N / NA		SAMPLES INTACT Y / N / NA	
RECEIVED IN GOOD COND. Y / N		SAMPLES ACCEPTED Y / N	

TURN AROUND TIME

☒ NORMAL ☐ RUSH ☐ SAME DAY ☐ NEXT DAY ☐ 2 DAYS ☐ 3 DAYS

	1.	2.	3.
RELINQUISHED BY SAMPLER:	Signature:	Signature:	Signature:
	Printed Name: William Raschke	Printed Name:	Printed Name: CARLOS GONZALEZ
	Date: 12/18/09 Time: 0745	Date: Time:	Date: 12/18/09 Time: 0840
RECEIVED BY:	Signature:	Signature:	RECEIVED BY LABORATORY: AETL
	Printed Name: CARLOS GONZALEZ	Printed Name:	Signature:
	Date: 12/18/09 Time: 0745	Date: Time:	Printed Name: Jean Claude
			Date: 12/18/09 Time: 0840

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator

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ANALYTICAL RESULTS

Ordered By

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Page: **2**

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A1

Our Lab I.D.			Method Blank	55293.02	55293.03	55293.06	55293.08
Client Sample I.D.				GP1-5	GP1-10	GP3-5	GP3-15
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	25	50	ND	ND	ND	ND	ND
Benzene	1.0	10.0	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND	ND	ND	ND
Bromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromodichloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	25	50	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	15	30	ND	ND	ND	ND	ND
2-Butanone (MEK)	25	50	ND	ND	ND	ND	ND
n-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Carbon Disulfide	25	50	ND	ND	ND	ND	ND
Carbon tetrachloride	5.0	10.0	ND	ND	ND	ND	ND
Chlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
Chloroethane	15	30	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50	50	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	5.0	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	15	30	ND	ND	ND	ND	ND
2-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	25	50	ND	ND	ND	ND	ND
Dibromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND	ND	ND	ND
Dibromomethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A1

Our Lab I.D.			Method Blank	55293.02	55293.03	55293.06	55293.08
Client Sample I.D.				GP1-5	GP1-10	GP3-5	GP3-15
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Dichlorodifluoromethane	15	30	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
Ethylbenzene	1.0	10.0	ND	ND	ND	ND	ND
Hexachlorobutadiene	15	30	ND	ND	ND	ND	ND
2-Hexanone	25	50	ND	ND	ND	ND	ND
Iodomethane	5.0	10.0	ND	ND	ND	ND	ND
Isopropylbenzene	5.0	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND	ND	ND	ND
Methylene chloride (DCM)	25	50	ND	ND	ND	ND	ND
Naphthalene	5.0	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Styrene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
Tetrachloroethene	5.0	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	1.0	10.0	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
Trichloroethene	5.0	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A1

Our Lab I.D.			Method Blank	55293.02	55293.03	55293.06	55293.08
Client Sample I.D.				GP1-5	GP1-10	GP3-5	GP3-15
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2,3-Trichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Vinyl Acetate	25	50	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	15	30	ND	ND	ND	ND	ND
o-Xylene	1.0	10.0	ND	ND	ND	ND	ND
m,p-Xylenes	1.0	20.0	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	55293.02	55293.03	55293.06	55293.08
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Bromofluorobenzene	75-125		113	105	106	108	105
Dibromofluoromethane	75-125		102	106	104	105	108
Toluene-d8	75-125		101	87.7	90.7	89.4	87.8

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ANALYTICAL RESULTS

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2

Our Lab I.D.			Method Blank	55293.10	55293.11	55293.14	55293.16
Client Sample I.D.				GP7-5	GP7-10	GP8-5	GP8-15
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	25	50	ND	ND	ND	ND	ND
Benzene	1.0	10.0	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND	ND	ND	ND
Bromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromodichloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	25	50	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	15	30	ND	ND	ND	ND	ND
2-Butanone (MEK)	25	50	ND	ND	ND	ND	ND
n-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Carbon Disulfide	25	50	ND	ND	ND	ND	ND
Carbon tetrachloride	5.0	10.0	ND	ND	ND	ND	ND
Chlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
Chloroethane	15	30	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50	50	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	5.0	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	15	30	ND	ND	ND	ND	ND
2-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	25	50	ND	ND	ND	ND	ND
Dibromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND	ND	ND	ND
Dibromomethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2

Our Lab I.D.			Method Blank	55293.10	55293.11	55293.14	55293.16
Client Sample I.D.				GP7-5	GP7-10	GP8-5	GP8-15
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Dichlorodifluoromethane	15	30	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
Ethylbenzene	1.0	10.0	ND	ND	ND	ND	ND
Hexachlorobutadiene	15	30	ND	ND	ND	ND	ND
2-Hexanone	25	50	ND	ND	ND	ND	ND
Iodomethane	5.0	10.0	ND	ND	ND	ND	ND
Isopropylbenzene	5.0	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND	ND	ND	ND
Methylene chloride (DCM)	25	50	ND	ND	ND	ND	ND
Naphthalene	5.0	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Styrene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
Tetrachloroethene	5.0	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	1.0	10.0	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
Trichloroethene	5.0	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2

Our Lab I.D.			Method Blank	55293.10	55293.11	55293.14	55293.16
Client Sample I.D.				GP7-5	GP7-10	GP8-5	GP8-15
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2,3-Trichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Vinyl Acetate	25	50	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	15	30	ND	ND	ND	ND	ND
o-Xylene	1.0	10.0	ND	ND	ND	ND	ND
m,p-Xylenes	1.0	20.0	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	55293.10	55293.11	55293.14	55293.16
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Bromofluorobenzene	75-125		112	107	106	108	106
Dibromofluoromethane	75-125		109	105	105	107	106
Toluene-d8	75-125		89.6	88.6	89.6	88.6	87.7

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ANALYTICAL RESULTS

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Page: **8**

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2

Our Lab I.D.			55293.18	55293.19	55293.21	55293.23	
Client Sample I.D.			GP10-5	GP10-10	GP6-1	GP6-10	
Date Sampled			12/17/2009	12/17/2009	12/17/2009	12/17/2009	
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	
Preparation Method			5035A	5035A	5035A	5035A	
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	
Matrix			Soil	Soil	Soil	Soil	
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
Acetone	25	50	ND	ND	ND	ND	
Benzene	1.0	10.0	ND	ND	ND	ND	
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND	ND	ND	
Bromochloromethane	5.0	10.0	ND	ND	ND	ND	
Bromodichloromethane	5.0	10.0	ND	ND	ND	ND	
Bromoform (Tribromomethane)	25	50	ND	ND	ND	ND	
Bromomethane (Methyl bromide)	15	30	ND	ND	ND	ND	
2-Butanone (MEK)	25	50	ND	ND	ND	ND	
n-Butylbenzene	5.0	10.0	ND	ND	ND	ND	
sec-Butylbenzene	5.0	10.0	ND	ND	ND	ND	
tert-Butylbenzene	5.0	10.0	ND	ND	ND	ND	
Carbon Disulfide	25	50	ND	ND	ND	ND	
Carbon tetrachloride	5.0	10.0	ND	ND	ND	ND	
Chlorobenzene	5.0	10.0	ND	ND	ND	ND	
Chloroethane	15	30	ND	ND	ND	ND	
2-Chloroethyl vinyl ether	50	50	ND	ND	ND	ND	
Chloroform (Trichloromethane)	5.0	10.0	ND	ND	ND	ND	
Chloromethane (Methyl chloride)	15	30	ND	ND	ND	ND	
2-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	
4-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	
1,2-Dibromo-3-chloropropane (DBCP)	25	50	ND	ND	ND	ND	
Dibromochloromethane	5.0	10.0	ND	ND	ND	ND	
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND	ND	ND	
Dibromomethane	5.0	10.0	ND	ND	ND	ND	
1,2-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	
1,3-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	
1,4-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2

Our Lab I.D.			55293.18	55293.19	55293.21	55293.23	
Client Sample I.D.			GP10-5	GP10-10	GP6-1	GP6-10	
Date Sampled			12/17/2009	12/17/2009	12/17/2009	12/17/2009	
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	
Preparation Method			5035A	5035A	5035A	5035A	
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	
Matrix			Soil	Soil	Soil	Soil	
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
Dichlorodifluoromethane	15	30	ND	ND	ND	ND	
1,1-Dichloroethane	5.0	10.0	ND	ND	ND	ND	
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND	ND	ND	
1,1-Dichloroethene	5.0	10.0	ND	ND	ND	ND	
cis-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	
trans-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	
1,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	
1,3-Dichloropropane	5.0	10.0	ND	ND	ND	ND	
2,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	
1,1-Dichloropropene	5.0	10.0	ND	ND	ND	ND	
cis-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	
trans-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	
Ethylbenzene	1.0	10.0	ND	ND	ND	ND	
Hexachlorobutadiene	15	30	ND	ND	ND	ND	
2-Hexanone	25	50	ND	ND	ND	ND	
Iodomethane	5.0	10.0	ND	ND	ND	ND	
Isopropylbenzene	5.0	10.0	ND	ND	ND	ND	
p-Isopropyltoluene	5.0	10.0	ND	ND	ND	ND	
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND	ND	ND	
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND	ND	ND	
Methylene chloride (DCM)	25	50	ND	ND	ND	ND	
Naphthalene	5.0	10.0	ND	ND	ND	ND	
n-Propylbenzene	5.0	10.0	ND	ND	ND	ND	
Styrene	5.0	10.0	ND	ND	ND	ND	
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	
Tetrachloroethene	5.0	10.0	ND	ND	ND	ND	
Toluene (Methyl benzene)	1.0	10.0	ND	ND	ND	ND	
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	
1,1,1-Trichloroethane	5.0	10.0	ND	ND	ND	ND	
1,1,2-Trichloroethane	5.0	10.0	ND	ND	ND	ND	
Trichloroethene	5.0	10.0	ND	ND	ND	ND	
Trichlorofluoromethane	5.0	10.0	ND	ND	ND	ND	

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2

Our Lab I.D.			55293.18	55293.19	55293.21	55293.23	
Client Sample I.D.			GP10-5	GP10-10	GP6-1	GP6-10	
Date Sampled			12/17/2009	12/17/2009	12/17/2009	12/17/2009	
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	
Preparation Method			5035A	5035A	5035A	5035A	
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	
Matrix			Soil	Soil	Soil	Soil	
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
1,2,3-Trichloropropane	5.0	10.0	ND	ND	ND	ND	
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	
Vinyl Acetate	25	50	ND	ND	ND	ND	
Vinyl chloride (Chloroethene)	15	30	ND	ND	ND	ND	
o-Xylene	1.0	10.0	ND	ND	ND	ND	
m,p-Xylenes	1.0	20.0	ND	ND	ND	ND	
Our Lab I.D.			55293.18	55293.19	55293.21	55293.23	
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
Bromofluorobenzene	75-125		107	107	110	106	
Dibromofluoromethane	75-125		107	107	103	106	
Toluene-d8	75-125		89.4	89.0	89.4	89.3	

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14041 Live Oak Avenue
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Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 122109NB1

Our Lab I.D.			Method Blank	**55293.02**	**55293.03**	**55293.06**	**55293.08**
Client Sample I.D.				GP1-5	GP1-10	GP3-5	GP3-15
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH as Gasoline and Light HC. (C4-C12)	0.100	1.000	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	**55293.02**	**55293.03**	**55293.06**	**55293.08**
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Bromofluorobenzene	75-125		97.8	110	106	98.0	94.8

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14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 122109NB1

Our Lab I.D.			55293.10	55293.11	55293.14	55293.16	55293.18
Client Sample I.D.			GP7-5	GP7-10	GP8-5	GP8-15	GP10-5
Date Sampled			12/17/2009	12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH as Gasoline and Light HC. (C4-C12)	0.100	1.000	ND	ND	ND	ND	ND
Our Lab I.D.			**55293.10**	**55293.11**	**55293.14**	**55293.16**	**55293.18**
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Bromofluorobenzene	75-125		98.4	107	107	98.8	104

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14041 Live Oak Avenue
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Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 122109NB1

Our Lab I.D.			**55293.19**	**55293.21**	**55293.23**		
Client Sample I.D.			GP10-10	GP6-1	GP6-10		
Date Sampled			12/17/2009	12/17/2009	12/17/2009		
Date Prepared			12/21/2009	12/21/2009	12/21/2009		
Preparation Method			5035A	5035A	5035A		
Date Analyzed			12/21/2009	12/21/2009	12/21/2009		
Matrix			Soil	Soil	Soil		
Units			mg/Kg	mg/Kg	mg/Kg		
Dilution Factor			1	1	1		
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**		
TPH as Gasoline and Light HC. (C4-C12)	0.100	1.000	ND	ND	ND		
Our Lab I.D.			**55293.19**	**55293.21**	**55293.23**		
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**		
Bromofluorobenzene	75-125		99.8	105	102		

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14041 Live Oak Avenue
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Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 121809DB2

Our Lab I.D.			Method Blank	**55293.02**	**55293.03**	**55293.06**	**55293.08**
Client Sample I.D.				GP1-5	GP1-10	GP3-5	GP3-15
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/18/2009	12/18/2009	12/18/2009	12/18/2009	12/18/2009
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			12/19/2009	12/19/2009	12/19/2009	12/19/2009	12/19/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH as Diesel (C13-C22)	1.0	5.0	ND	ND	ND	ND	ND
TPH as Heavy Hydrocarbons (C23-C40)	1.0	5.0	ND	ND	ND	ND	ND
TPH Total as Diesel and Heavy HC.C13-C40	1.0	5.0	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	**55293.02**	**55293.03**	**55293.06**	**55293.08**
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Chlorobenzene	75-125		87.7	85.8	89.8	88.8	89.9

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14041 Live Oak Avenue
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Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 121809DB2

Our Lab I.D.			55293.10	55293.11	55293.14	55293.16	55293.18
Client Sample I.D.			GP7-5	GP7-10	GP8-5	GP8-15	GP10-5
Date Sampled			12/17/2009	12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/18/2009	12/18/2009	12/18/2009	12/18/2009	12/18/2009
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			12/19/2009	12/19/2009	12/19/2009	12/19/2009	12/19/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH as Diesel (C13-C22)	1.0	5.0	ND	ND	ND	16.1	ND
TPH as Heavy Hydrocarbons (C23-C40)	1.0	5.0	101	ND	ND	83.0	ND
TPH Total as Diesel and Heavy HC.C13-C40	1.0	5.0	101	ND	ND	99.1	ND
Our Lab I.D.			55293.10	55293.11	55293.14	55293.16	55293.18
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Chlorobenzene	75-125		88.4	88.5	88.3	84.6	92.4

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14041 Live Oak Avenue
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Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 121809DB2

Our Lab I.D.			**55293.19**	**55293.21**	**55293.23**		
Client Sample I.D.			GP10-10	GP6-1	GP6-10		
Date Sampled			12/17/2009	12/17/2009	12/17/2009		
Date Prepared			12/18/2009	12/18/2009	12/18/2009		
Preparation Method			3550B	3550B	3550B		
Date Analyzed			12/19/2009	12/19/2009	12/19/2009		
Matrix			Soil	Soil	Soil		
Units			mg/Kg	mg/Kg	mg/Kg		
Dilution Factor			1	1	1		
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**		
TPH as Diesel (C13-C22)	1.0	5.0	ND	ND	ND		
TPH as Heavy Hydrocarbons (C23-C40)	1.0	5.0	ND	89.8	ND		
TPH Total as Diesel and Heavy HC.C13-C40	1.0	5.0	ND	89.8	ND		
Our Lab I.D.			**55293.19**	**55293.21**	**55293.23**		
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**		
Chlorobenzene	75-125		89.2	89.8	91.4		

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14041 Live Oak Avenue
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Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			Method Blank	55293.02	55293.06	55293.10	55293.14
Client Sample I.D.				GP1-5	GP3-5	GP7-5	GP8-5
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acenaphthene	0.25	0.50	ND	ND	ND	ND	ND
Acenaphthylene	0.25	0.50	ND	ND	ND	ND	ND
Anthracene	0.25	0.50	ND	ND	ND	ND	ND
Azobenzene	0.25	0.50	ND	ND	ND	ND	ND
Benzidine	0.25	0.50	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.25	0.50	ND	ND	ND	ND	ND
Benzo(a)pyrene	0.25	0.50	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.25	0.50	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.25	0.50	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	0.25	0.50	ND	ND	ND	ND	ND
Benzoic Acid	0.25	0.50	ND	ND	ND	ND	ND
Benzyl Alcohol	0.25	0.50	ND	ND	ND	ND	ND
Bis(2-Chloroethoxy)methane	0.25	0.50	ND	ND	ND	ND	ND
Bis(2-Chloroethyl)ether	0.25	0.50	ND	ND	ND	ND	ND
Bis(2-chloroisopropyl) ether	0.25	0.50	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	0.25	0.50	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	0.25	0.50	ND	ND	ND	ND	ND
Butyl benzyl phthalate	0.25	0.50	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	0.25	0.50	ND	ND	ND	ND	ND
4-Chloroaniline	0.25	0.50	ND	ND	ND	ND	ND
2-Chloronaphthalene	0.25	0.50	ND	ND	ND	ND	ND
2-Chlorophenol	0.25	0.50	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether	0.25	0.50	ND	ND	ND	ND	ND
Chrysene	0.25	0.50	ND	ND	ND	ND	ND
Di-n-butyl phthalate	0.25	0.50	ND	ND	ND	ND	ND
Di-n-octyl phthalate (Dioctyl ester)	0.25	0.50	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	0.25	0.50	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			Method Blank	55293.02	55293.06	55293.10	55293.14
Client Sample I.D.				GP1-5	GP3-5	GP7-5	GP8-5
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Dibenzofuran	0.25	0.50	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine	0.25	0.50	ND	ND	ND	ND	ND
2,4-Dichlorophenol	0.25	0.50	ND	ND	ND	ND	ND
Diethyl phthalate (Diethyl ester)	0.25	0.50	ND	ND	ND	ND	ND
Dimethyl phthalate (Dimethyl ester)	0.25	0.50	ND	ND	ND	ND	ND
2,4-Dimethylphenol	0.25	0.50	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	0.25	0.50	ND	ND	ND	ND	ND
2,4-Dinitrophenol	0.25	0.50	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	0.25	0.50	ND	ND	ND	ND	ND
2,6-Dinitrotoluene (2,6-DNT)	0.25	0.50	ND	ND	ND	ND	ND
Fluoranthene	0.25	0.50	ND	ND	ND	ND	ND
Fluorene	0.25	0.50	ND	ND	ND	ND	ND
Hexachlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.25	0.50	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	0.25	0.50	ND	ND	ND	ND	ND
Hexachloroethane	0.25	0.50	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	0.25	0.50	ND	ND	ND	ND	ND
Isophorone	0.25	0.50	ND	ND	ND	ND	ND
2-Methylnaphthalene	0.25	0.50	ND	ND	ND	ND	ND
4-Methylphenol	0.25	0.50	ND	ND	ND	ND	ND
2-Methylphenol (2-Cresol)	0.25	0.50	ND	ND	ND	ND	ND
3-Methylphenol (3-Cresol)	0.25	0.50	ND	ND	ND	ND	ND
N-Nitroso-Di-n-propylamine	0.25	0.50	ND	ND	ND	ND	ND
Naphthalene	0.25	0.50	ND	ND	ND	ND	ND
2-Nitroaniline	0.25	0.50	ND	ND	ND	ND	ND
3-Nitroaniline	0.25	0.50	ND	ND	ND	ND	ND
4-Nitroaniline	0.25	0.50	ND	ND	ND	ND	ND
Nitrobenzene (NB)	0.25	0.50	ND	ND	ND	ND	ND
4-Nitrophenol	0.25	0.50	ND	ND	ND	ND	ND
2-Nitrophenol (o-Nitrophenol)	0.25	0.50	ND	ND	ND	ND	ND
N-nitrosodiphenylamine	0.25	0.50	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			Method Blank	55293.02	55293.06	55293.10	55293.14
Client Sample I.D.				GP1-5	GP3-5	GP7-5	GP8-5
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Pentachlorophenol	0.25	0.50	ND	ND	ND	ND	ND
Phenanthrene	0.25	0.50	ND	ND	ND	ND	ND
Phenol	0.25	0.50	ND	ND	ND	ND	ND
Pyrene	0.25	0.50	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.25	0.50	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	0.25	0.50	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	0.25	0.50	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	55293.02	55293.06	55293.10	55293.14
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
2-Fluorophenol	25-121		69.2	68.6	67.0	69.3	62.5
2-Fluorobiphenyl	30-115		80.8	80.5	76.3	78.2	73.2
Nitrobenzene-d5	23-120		72.4	70.2	69.8	74.6	67.6
Phenol-d6	21-113		70.8	65.1	66.0	66.4	62.5
p-Terphenyl-D14	18-137		82.8	83.2	77.8	81.6	77.3
2,4,6-Tribromophenol	19-122		83.0	81.1	76.5	76.0	76.3

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			55293.18	55293.23			
Client Sample I.D.			GP10-5	GP6-10			
Date Sampled			12/17/2009	12/17/2009			
Date Prepared			12/22/2009	12/22/2009			
Preparation Method			3550B	3550B			
Date Analyzed			12/22/2009	12/22/2009			
Matrix			Soil	Soil			
Units			mg/Kg	mg/Kg			
Dilution Factor			1	1			
Analytes	**MDL**	**PQL**	**Results**	**Results**			
Acenaphthene	0.25	0.50	ND	ND			
Acenaphthylene	0.25	0.50	ND	ND			
Anthracene	0.25	0.50	ND	ND			
Azobenzene	0.25	0.50	ND	ND			
Benzidine	0.25	0.50	ND	ND			
Benzo(a)anthracene	0.25	0.50	ND	ND			
Benzo(a)pyrene	0.25	0.50	ND	ND			
Benzo(b)fluoranthene	0.25	0.50	ND	ND			
Benzo(g,h,i)perylene	0.25	0.50	ND	ND			
Benzo(k)fluoranthene	0.25	0.50	ND	ND			
Benzoic Acid	0.25	0.50	ND	ND			
Benzyl Alcohol	0.25	0.50	ND	ND			
Bis(2-Chloroethoxy)methane	0.25	0.50	ND	ND			
Bis(2-Chloroethyl)ether	0.25	0.50	ND	ND			
Bis(2-chloroisopropyl) ether	0.25	0.50	ND	ND			
Bis(2-ethylhexyl) phthalate	0.25	0.50	ND	ND			
4-Bromophenyl phenyl ether	0.25	0.50	ND	ND			
Butyl benzyl phthalate	0.25	0.50	ND	ND			
4-Chloro-3-methylphenol	0.25	0.50	ND	ND			
4-Chloroaniline	0.25	0.50	ND	ND			
2-Chloronaphthalene	0.25	0.50	ND	ND			
2-Chlorophenol	0.25	0.50	ND	ND			
4-Chlorophenyl phenyl ether	0.25	0.50	ND	ND			
Chrysene	0.25	0.50	ND	ND			
Di-n-butyl phthalate	0.25	0.50	ND	ND			
Di-n-octyl phthalate (Dioctyl ester)	0.25	0.50	ND	ND			
Dibenzo(a,h)anthracene	0.25	0.50	ND	ND			

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			55293.18	55293.23			
Client Sample I.D.			GP10-5	GP6-10			
Date Sampled			12/17/2009	12/17/2009			
Date Prepared			12/22/2009	12/22/2009			
Preparation Method			3550B	3550B			
Date Analyzed			12/22/2009	12/22/2009			
Matrix			Soil	Soil			
Units			mg/Kg	mg/Kg			
Dilution Factor			1	1			
Analytes	**MDL**	**PQL**	**Results**	**Results**			
Dibenzofuran	0.25	0.50	ND	ND			
1,2-Dichlorobenzene	0.25	0.50	ND	ND			
1,3-Dichlorobenzene	0.25	0.50	ND	ND			
1,4-Dichlorobenzene	0.25	0.50	ND	ND			
3,3'-Dichlorobenzidine	0.25	0.50	ND	ND			
2,4-Dichlorophenol	0.25	0.50	ND	ND			
Diethyl phthalate (Diethyl ester)	0.25	0.50	ND	ND			
Dimethyl phthalate (Dimethyl ester)	0.25	0.50	ND	ND			
2,4-Dimethylphenol	0.25	0.50	ND	ND			
4,6-Dinitro-2-methylphenol	0.25	0.50	ND	ND			
2,4-Dinitrophenol	0.25	0.50	ND	ND			
2,4-Dinitrotoluene	0.25	0.50	ND	ND			
2,6-Dinitrotoluene (2,6-DNT)	0.25	0.50	ND	ND			
Fluoranthene	0.25	0.50	ND	ND			
Fluorene	0.25	0.50	ND	ND			
Hexachlorobenzene	0.25	0.50	ND	ND			
Hexachlorobutadiene	0.25	0.50	ND	ND			
Hexachlorocyclopentadiene	0.25	0.50	ND	ND			
Hexachloroethane	0.25	0.50	ND	ND			
Indeno(1,2,3-cd)pyrene	0.25	0.50	ND	ND			
Isophorone	0.25	0.50	ND	ND			
2-Methylnaphthalene	0.25	0.50	ND	ND			
4-Methylphenol	0.25	0.50	ND	ND			
2-Methylphenol (2-Cresol)	0.25	0.50	ND	ND			
3-Methylphenol (3-Cresol)	0.25	0.50	ND	ND			
N-Nitroso-Di-n-propylamine	0.25	0.50	ND	ND			
Naphthalene	0.25	0.50	ND	ND			
2-Nitroaniline	0.25	0.50	ND	ND			
3-Nitroaniline	0.25	0.50	ND	ND			
4-Nitroaniline	0.25	0.50	ND	ND			
Nitrobenzene (NB)	0.25	0.50	ND	ND			
4-Nitrophenol	0.25	0.50	ND	ND			
2-Nitrophenol (o-Nitrophenol)	0.25	0.50	ND	ND			
N-nitrosodiphenylamine	0.25	0.50	ND	ND			

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			**55293.18**	**55293.23**			
Client Sample I.D.			GP10-5	GP6-10			
Date Sampled			12/17/2009	12/17/2009			
Date Prepared			12/22/2009	12/22/2009			
Preparation Method			3550B	3550B			
Date Analyzed			12/22/2009	12/22/2009			
Matrix			Soil	Soil			
Units			mg/Kg	mg/Kg			
Dilution Factor			1	1			
Analytes	**MDL**	**PQL**	**Results**	**Results**			
Pentachlorophenol	0.25	0.50	ND	ND			
Phenanthrene	0.25	0.50	ND	ND			
Phenol	0.25	0.50	ND	ND			
Pyrene	0.25	0.50	ND	ND			
1,2,4-Trichlorobenzene	0.25	0.50	ND	ND			
2,4,5-Trichlorophenol	0.25	0.50	ND	ND			
2,4,6-Trichlorophenol	0.25	0.50	ND	ND			
Our Lab I.D.			**55293.18**	**55293.23**			
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**			
2-Fluorophenol	25-121		71.7	74.6			
2-Fluorobiphenyl	30-115		75.6	78.3			
Nitrobenzene-d5	23-120		69.9	74.4			
Phenol-d6	21-113		67.8	71.4			
p-Terphenyl-D14	18-137		76.8	81.2			
2,4,6-Tribromophenol	19-122		79.5	81.5			

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (6010B/7000CAM), CAM Title 22 Metals (SW-846)

QC Batch No: 122209

Our Lab I.D.			Method Blank	55293.02	55293.03	55293.06	55293.08
Client Sample I.D.				GP1-5	GP1-10	GP3-5	GP3-15
Date Sampled				12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Preparation Method			3050B	3050B	3050B	3050B	3050B
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Antimony	1.0	5.0	ND	ND	ND	ND	ND
Arsenic	1.0	5.0	ND	ND	ND	ND	ND
Barium	2.5	5.0	ND	32.3	74.8	91.1	58.2
Beryllium	1.3	2.5	ND	ND	ND	ND	ND
Cadmium	1.3	2.5	ND	ND	ND	ND	ND
Chromium	2.5	5.0	ND	4.55J	15.0	12.8	3.30J
Cobalt	2.5	5.0	ND	3.20J	4.95J	7.45	4.05J
Copper	2.5	5.0	ND	5.95	9.15	13.9	11.7
Lead	2.5	5.0	ND	ND	ND	ND	ND
Mercury (By EPA 7471)	0.1	0.2	ND	ND	ND	ND	ND
Molybdenum	2.5	5.0	ND	ND	ND	ND	ND
Nickel	2.5	5.0	ND	3.25J	6.90	9.85	3.05J
Selenium	1.0	5.0	ND	ND	ND	ND	ND
Silver	2.5	5.0	ND	ND	ND	ND	ND
Thallium	1.0	5.0	ND	ND	ND	ND	ND
Vanadium	2.5	5.0	ND	9.80	15.3	25.1	14.0
Zinc	2.5	5.0	ND	18.0	32.0	37.2	35.5

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14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (6010B/7000CAM), CAM Title 22 Metals (SW-846)

QC Batch No: 122209

Our Lab I.D.			55293.10	55293.11	55293.14	55293.16	55293.18
Client Sample I.D.			GP7-5	GP7-10	GP8-5	GP8-15	GP10-5
Date Sampled			12/17/2009	12/17/2009	12/17/2009	12/17/2009	12/17/2009
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Preparation Method			3050B	3050B	3050B	3050B	3050B
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Antimony	1.0	5.0	ND	ND	ND	ND	ND
Arsenic	1.0	5.0	1.75J	ND	ND	ND	1.95J
Barium	2.5	5.0	64.6	47.9	38.0	67.0	119
Beryllium	1.3	2.5	ND	ND	ND	ND	ND
Cadmium	1.3	2.5	ND	ND	ND	ND	1.35J
Chromium	2.5	5.0	9.00	6.90	5.55	9.20	16.5
Cobalt	2.5	5.0	5.50	4.30J	3.40J	6.85	9.30
Copper	2.5	5.0	12.5	7.60	5.35	5.55	19.1
Lead	2.5	5.0	10.2	ND	ND	ND	5.00
Mercury (By EPA 7471)	0.1	0.2	ND	ND	ND	ND	0.209
Molybdenum	2.5	5.0	ND	ND	ND	ND	ND
Nickel	2.5	5.0	7.15	5.25	4.40J	6.20	12.9
Selenium	1.0	5.0	ND	ND	ND	ND	ND
Silver	2.5	5.0	ND	ND	ND	ND	ND
Thallium	1.0	5.0	ND	ND	ND	ND	ND
Vanadium	2.5	5.0	18.8	14.4	10.5	21.6	30.9
Zinc	2.5	5.0	38.4	22.8	21.9	44.9	56.5

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (6010B/7000CAM), CAM Title 22 Metals (SW-846)

QC Batch No: 122209

Our Lab I.D.			55293.19	55293.21	55293.23		
Client Sample I.D.			GP10-10	GP6-1	GP6-10		
Date Sampled			12/17/2009	12/17/2009	12/17/2009		
Date Prepared			12/22/2009	12/22/2009	12/22/2009		
Preparation Method			3050B	3050B	3050B		
Date Analyzed			12/22/2009	12/22/2009	12/22/2009		
Matrix			Soil	Soil	Soil		
Units			mg/Kg	mg/Kg	mg/Kg		
Dilution Factor			1	1	1		
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**		
Antimony	1.0	5.0	ND	ND	ND		
Arsenic	1.0	5.0	ND	1.00J	ND		
Barium	2.5	5.0	52.6	56.2	54.6		
Beryllium	1.3	2.5	ND	ND	ND		
Cadmium	1.3	2.5	ND	ND	ND		
Chromium	2.5	5.0	8.05	6.70	4.50J		
Cobalt	2.5	5.0	5.65	4.30J	4.05J		
Copper	2.5	5.0	17.5	9.10	6.05		
Lead	2.5	5.0	ND	2.50J	ND		
Mercury (By EPA 7471)	0.1	0.2	0.196J	ND	ND		
Molybdenum	2.5	5.0	ND	ND	ND		
Nickel	2.5	5.0	7.10	4.20J	3.65J		
Selenium	1.0	5.0	ND	ND	ND		
Silver	2.5	5.0	ND	ND	ND		
Thallium	1.0	5.0	ND	ND	ND		
Vanadium	2.5	5.0	17.0	16.6	15.8		
Zinc	2.5	5.0	27.7	32.1	24.8		

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (6010B/7000CAM), CAM Title 22 Metals (SW-846)

QC Batch No: 122209; Dup or Spiked Sample: 55323.01; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Antimony	3.05	50.0	51.7	97.2	50.0	52.6	99.0	1.8	80-120	<15
Arsenic	2.40	50.0	56.4	108	50.0	56.9	109	<1	80-120	<15
Barium	42.7	50.0	95.2	105	50.0	95.2	105	<1	80-120	<15
Beryllium	ND	50.0	56.0	112	50.0	56.5	113	<1	80-120	<15
Cadmium	0.750	50.0	53.3	105	50.0	53.3	105	<1	80-120	<15
Chromium	4.80	50.0	58.3	107	50.0	58.8	108	<1	80-120	<15
Cobalt	3.40	50.0	54.4	102	50.0	54.9	103	<1	80-120	<15
Copper	5.20	50.0	59.7	109	50.0	59.7	109	<1	80-120	<15
Lead	0.600	50.0	50.6	100	50.0	50.6	100	<1	80-120	<15
Mercury (By EPA 7471)	ND	0.500	0.570	114	0.500	0.575	115	<1	80-120	<15
Molybdenum	1.65	50.0	55.7	108	50.0	55.7	108	<1	80-120	<15
Nickel	0.475	50.0	55.5	110	50.0	56.0	111	<1	80-120	<15
Selenium	0.150	50.0	53.2	106	50.0	53.2	106	<1	80-120	<15
Silver	ND	50.0	51.5	103	50.0	51.5	103	<1	80-120	<15
Thallium	ND	50.0	49.7	99.4	50.0	50.5	101	1.6	80-120	<15
Vanadium	14.6	50.0	69.6	110	50.0	69.6	110	<1	80-120	<15
Zinc	20.1	50.0	73.6	107	50.0	73.6	107	<1	80-120	<15

QC Batch No: 122209; Dup or Spiked Sample: 55323.01; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Antimony	50.0	50.5	101	80-120						
Arsenic	50.0	52.0	104	80-120						
Barium	50.0	54.0	108	80-120						
Beryllium	50.0	53.5	107	80-120						
Cadmium	50.0	53.0	106	80-120						
Chromium	50.0	52.0	104	80-120						
Cobalt	50.0	51.5	103	80-120						
Copper	50.0	49.6	99.1	80-120						
Lead	50.0	51.0	102	80-120						

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QUALITY CONTROL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (6010B/7000CAM), CAM Title 22 Metals (SW-846)

QC Batch No: 122209; Dup or Spiked Sample: 55323.01; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Mercury (By EPA 7471)	0.500	0.510	109	80-120						
Molybdenum	50.0	54.0	108	80-120						
Nickel	50.0	52.0	104	80-120						
Selenium	50.0	52.5	105	80-120						
Silver	50.0	52.5	105	80-120						
Thallium	50.0	52.5	105	80-120						
Vanadium	50.0	52.0	104	80-120						
Zinc	50.0	54.0	108	80-120						

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QUALITY CONTROL RESULTS

Ordered By

Converse Consultants
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Telephone: (714)444-9660
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Page: **28**

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A1; Dup or Spiked Sample: B1221093A1; LCS: Clean Sand; QC Prepared: 12/21/2009; QC Analyzed: 12/21/2009; Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.00	50.0	56.0	112	50.0	53.5	107	4.57	75-125	<20
Chlorobenzene	0.00	50.0	47.0	94.0	50.0	47.2	94.4	<1	75-125	<20
1,1-Dichloroethene	0.00	50.0	58.0	116	50.0	58.5	117	<1	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.00	50.0	58.0	116	50.0	59.0	118	1.71	75-125	<20
Toluene (Methyl benzene)	0.00	50.0	50.0	100	50.0	51.0	102	1.98	75-125	<20
Trichloroethene	0.00	50.0	56.5	113	50.0	59.0	118	4.33	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	50.0	50.0	100	50.0	49.6	99.1	<1	75-125	<20
Dibromofluoromethane	0.00	50.0	54.5	109	50.0	55.0	110	<1	75-125	<20
Toluene-d8	0.00	50.0	41.8	83.6	50.0	41.4	82.7	1.08	75-125	<20

QC Batch No: 1221093A1; Dup or Spiked Sample: B1221093A1; LCS: Clean Sand; QC Prepared: 12/21/2009; QC Analyzed: 12/21/2009; Units: ug/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Benzene	50.0	62.1	124	75-125						
Chlorobenzene	50.0	45.7	91.4	75-125						
1,1-Dichloroethene	50.0	56.9	114	75-125						
Methyl-tert-butyl ether (MTBE)	50.0	60.8	122	75-125						
Toluene (Methyl benzene)	50.0	49.8	99.6	75-125						
Trichloroethene	50.0	60.4	121	75-125						
LCS										
Chloroform (Trichloromethane)	50.0	60.1	120	75-125						
Ethylbenzene	50.0	54.6	109	75-125						
1,1,1-Trichloroethane	50.0	59.0	118	75-125						
o-Xylene	50.0	51.2	102	75-125						
m,p-Xylenes	100	105	105	75-125						
Surrogates										
Bromofluorobenzene	50.0	50.6	101	75-125						
Dibromofluoromethane	50.0	55.3	111	75-125						
Toluene-d8	50.0	42.6	85.1	75-125						

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Page: **29**

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2; Dup or Spiked Sample: B1221093A2; LCS: Clean Sand; QC Prepared: 12/21/2009; QC Analyzed: 12/21/2009; Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.00	50.0	59.5	119	50.0	60.0	120	<1	75-125	<20
Chlorobenzene	0.00	50.0	42.5	85.0	50.0	43.3	86.6	1.86	75-125	<20
1,1-Dichloroethene	0.00	50.0	59.5	119	50.0	54.5	109	8.77	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.00	50.0	61.5	123	50.0	56.5	113	8.47	75-125	<20
Toluene (Methyl benzene)	0.00	50.0	46.3	92.6	50.0	47.2	94.4	1.93	75-125	<20
Trichloroethene	0.00	50.0	58.5	117	50.0	60.5	121	3.36	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	50.0	50.0	100	50.0	49.8	99.6	<1	75-125	<20
Dibromofluoromethane	0.00	50.0	55.0	110	50.0	55.0	110	<1	75-125	<20
Toluene-d8	0.00	50.0	41.7	83.3	50.0	41.9	83.8	<1	75-125	<20

QC Batch No: 1221093A2; Dup or Spiked Sample: B1221093A2; LCS: Clean Sand; QC Prepared: 12/21/2009; QC Analyzed: 12/21/2009; Units: ug/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Benzene	50.0	60.5	121	75-125						
Chlorobenzene	50.0	43.3	86.6	75-125						
1,1-Dichloroethene	50.0	55.3	111	75-125						
Methyl-tert-butyl ether (MTBE)	50.0	56.9	114	75-125						
Toluene (Methyl benzene)	50.0	47.1	94.2	75-125						
Trichloroethene	50.0	59.6	119	75-125						
LCS										
Chloroform (Trichloromethane)	50.0	56.1	112	75-125						
Ethylbenzene	50.0	50.2	100	75-125						
1,1,1-Trichloroethane	50.0	56.7	113	75-125						
o-Xylene	50.0	48.1	96.2	75-125						
m,p-Xylenes	100	95.0	95.0	75-125						
Surrogates										
Bromofluorobenzene	50.0	49.9	99.7	75-125						
Dibromofluoromethane	50.0	55.3	111	75-125						
Toluene-d8	50.0	42.2	84.4	75-125						

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1; Dup or Spiked Sample: 55293.06; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Acenaphthene	0.00	5.00	3.77	75.4	5.00	4.13	82.6	9.1	46-118	<20
4-Chloro-3-methylphenol	0.00	10.0	8.66	86.6	10.0	8.70	87.0	<1	39-98	<20
2-Chlorophenol	0.00	10.0	7.55	75.5	10.0	8.14	81.4	7.5	27-123	<20
1,4-Dichlorobenzene	0.00	5.00	3.65	73.0	5.00	3.96	79.2	8.1	36-97	<20
2,4-Dinitrotoluene	0.00	5.00	4.08	81.6	5.00	4.19	83.8	2.7	24-96	<20
N-Nitroso-Di-n-propylamine	0.00	5.00	4.49	89.8	5.00	4.42	88.4	1.6	41-116	<20
4-Nitrophenol	0.00	10.0	8.00	80.0	10.0	7.92	79.2	1.0	10-80	<20
Pentachlorophenol	0.00	10.0	8.31	83.1	10.0	9.53	95.3	13.7	40-125	<20
Phenol	0.00	10.0	7.66	76.6	10.0	8.44	84.4	9.7	12-89	<20
Pyrene	0.00	5.00	3.83	76.6	5.00	4.43	88.6	14.5	26-127	<20
1,2,4-Trichlorobenzene	0.00	5.00	3.78	75.6	5.00	4.24	84.8	11.5	39-98	<20
Surrogates										
2-Fluorophenol	0.00	5.00	3.40	68.0	5.00	3.89	77.8	13.4	25-121	<20
2-Fluorobiphenyl	0.00	2.50	1.94	77.6	2.50	2.18	87.2	11.7	30-115	<20
Nitrobenzene-d5	0.00	2.50	1.88	75.2	2.50	2.04	81.6	8.2	23-120	<20
p-Terphenyl-D14	0.00	2.50	1.92	76.8	2.50	2.25	90.0	15.8	18-137	<20
Phenol-d6	0.00	5.00	3.75	75.0	5.00	4.08	81.6	8.4	24-113	<20
2,4,6-Tribromophenol	0.00	5.00	4.29	85.8	5.00	4.79	95.8	11.0	19-122	<20

QC Batch No: 122209KB1; Dup or Spiked Sample: 55293.06; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Acenaphthene	5.00	4.42	88.4	31-137						
4-Chloro-3-methylphenol	10.0	9.22	92.2	40-99						
2-Chlorophenol	10.0	8.59	85.9	25-102						
1,4-Dichlorobenzene	5.00	4.22	84.4	28-104						
2,4-Dinitrotoluene	5.00	4.55	91.0	28-89						
N-Nitroso-Di-n-propylamine	5.00	4.89	97.8	41-126						
4-Nitrophenol	10.0	7.97	79.7	11-114						
Pentachlorophenol	10.0	8.78	87.8	17-125						

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QUALITY CONTROL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1; Dup or Spiked Sample: 55293.06; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Phenol	10.0	8.78	87.8	26-90						
Pyrene	5.00	4.42	88.4	35-142						
1,2,4-Trichlorobenzene	5.00	4.35	87.0	38-107						
Surrogates										
2-Fluorophenol	5.00	3.89	77.8	25-121						
2-Fluorobiphenyl	2.50	2.12	84.8	30-115						
Nitrobenzene-d5	2.50	2.00	80.0	23-120						
p-Terphenyl-D14	2.50	2.13	85.2	18-137						
Phenol-d6	5.00	4.06	81.2	24-113						
2,4,6-Tribromophenol	5.00	4.38	87.6	19-122						

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QUALITY CONTROL RESULTS

Ordered By

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Attn: William Ragsdale
Page: **32**

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 121809DB2; Dup or Spiked Sample: 55293.06; LCS: Clean Sand; QC Prepared: 12/18/2009; QC Analyzed: 12/19/2009; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
TPH as Diesel (C13-C22)	0.00	500	536	107	500	549	110	2.76	75-125	<20
Surrogates										
Chlorobenzene	0.00	100	86.1	86.1	100	92.0	92.0	6.85	75-125	<20

QC Batch No: 121809DB2; Dup or Spiked Sample: 55293.06; LCS: Clean Sand; QC Prepared: 12/18/2009; QC Analyzed: 12/19/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
TPH as Diesel (C13-C22)	500	521	104	75-125						
Surrogates										
Chlorobenzene	100	87.2	87.2	75-125						

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55293	12/18/2009	CONVRS

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 122109NB1; Dup or Spiked Sample: 55293.02; LCS: Clean Sand; QC Prepared: 12/21/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
TPH as Gasoline and Light HC. (C4-C12)	0.00	2.50	2.52	101	2.50	2.52	101	<1	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	0.0500	0.0489	97.8	0.0500	0.0515	103	5.32	75-125	<20

QC Batch No: 122109NB1; Dup or Spiked Sample: 55293.02; LCS: Clean Sand; QC Prepared: 12/21/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
TPH as Gasoline and Light HC. (C4-C12)	2.50	2.51	100	75-125						
Surrogates										
Bromofluorobenzene	0.0500	0.0529	106	75-125						

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Data Qualifiers and Descriptors

Data Qualifier:

*:	In the QC section, sample results have been taken directly from the ICP reading. No preparation factor has been applied.
B:	Analyte was present in the Method Blank.
D:	Result is from a diluted analysis.
E:	Result is beyond calibration limits and is estimated.
H:	Analysis was performed over the allowed holding time due to circumstances which were beyond laboratory control.
J:	Analyte was detected . However, the analyte concentration is an estimated value, which is between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL).
M:	Matrix spike recovery is outside control limits due to matrix interference. Laboratory Control Sample recovery was acceptable.
MCL:	Maximum Contaminant Level
NS:	No Standard Available
S6:	Surrogate recovery is outside control limits due to matrix interference.
S8:	The analysis of the sample required a dilution such that the surrogate concentration was diluted below the method acceptance criteria.
X:	Results represent LCS and LCSD data.

Definition:

%Limi:	Percent acceptable limits.
%REC:	Percent recovery.
Con.L:	Acceptable Control Limits
Conce:	Added concentration to the sample.
LCS:	Laboratory Control Sample
MDL:	Method Detection Limit is a statistically derived number which is specific for each instrument, each method, and each compound. It indicates a distinctively detectable quantity with 99% probability.

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Data Qualifiers and Descriptors

MS:	Matrix Spike
MS DU:	Matrix Spike Duplicate
ND:	Analyte was not detected in the sample at or above MDL.
PQL:	Practical Quantitation Limit or ML (Minimum Level as per RWQCB) is the minimum concentration that can be quantified with more than 99% confidence. Taking into account all aspects of the entire analytical instrumentation and practice.
Recov:	Recovered concentration in the sample.
RPD:	Relative Percent Difference

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Number of Pages	**27**
Date Received	**12/18/2009**
Date Reported	**12/30/2009**

Job Number	Order Date	Client
55304	12/18/2009	CONVRS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot
Site: 14041 Live Oak Avenue
Irwindale, CA 91706

Enclosed please find results of analyses of 8 soil samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Checked By: _____ Approved By: C. Razmara

Cyrus Razmara, Ph.D.
Laboratory Director

American Environmental Testing Laboratory Inc.

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CHAIN OF CUSTODY RECORD

№ 67338

AETL JOB No. 55304

COMPANY	Converse Consultants
PROJECT MANAGER	William Ragsdale
COMPANY ADDRESS	185 E. Palmira Ave Suite B, Costa Mesa CA
PHONE	714-444-9660
FAX	714-444-9640
PROJECT NAME	17 Acre Lot
PROJECT #	09-42-138-02
SITE NAME AND ADDRESS	14041 Live Oak Ave, Irwindale CA
PO #	

	SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
1	GP2- 1	55304.01	12/18/09	8:40	Soil	4oz's Islands	Ice
2	5	55304.02		8:43			
3	10	55304.03		8:46			
4	15	55304.04		8:58			
5	GP4- 1	55304.05		9:20			
6	5	55304.06		9:24			
7	10	55304.07		9:32			
8	15	—		—	—	—	—
9	GP5- 1	55304.08		10:44			
10	5	55304.09		10:47			
11	10	55304.10		10:55			
12	15	55304.11		11:00			
13	GP9- 1	55304.12		10:15			
14	5	55304.13		10:17			
15	10	55304.14		10:25			

ANALYSIS REQUESTED

Boise ec	Gold metals	8260 VOC's	8270 SVOC's	Archive
				X
X	X	X	X	
X	X	X		
				X
X	X	X		
X	X	X	X	
				X
—	—	—	—	—
				X
X	X	X		
				X
X	X	X		
				X
X	X	X	X	
				X

TEST INSTRUCTIONS & COMMENTS

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS	70	PROPERLY COOLED (Y) N / NA	
CUSTODY SEALS Y / (N) NA		SAMPLES INTACT (Y) N / NA	
RECEIVED IN GOOD COND. (Y) N		SAMPLES ACCEPTED (Y) N	

TURN AROUND TIME

☒ NORMAL ☐ RUSH ☐ SAME DAY ☐ NEXT DAY ☐ 2 DAYS ☐ 3 DAYS

RELINQUISHED BY SAMPLER: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature:	Signature:	Signature:
Printed Name: William Ragsdale	Printed Name:	Printed Name: Chris Gonzales
Date: 12/18/09 Time: 1340	Date: Time:	Date: 12/18/09 Time: 1430
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY LABORATORY: 3.**
Signature:	Signature:	Signature:
Printed Name: Chris Gonzales	Printed Name:	Printed Name: Julian
Date: 12/18/09 Time: 1340	Date: Time:	Date: 12/18/09 Time: 1430

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator

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CHAIN OF CUSTODY RECORD

№ 67341

AETL JOB No. 55304

COMPANY

PROJECT MANAGER

COMPANY ADDRESS SAME AS PAGE 1

PHONE

FAX

PROJECT NAME

PROJECT # 09-42-138-02

SITE NAME AND ADDRESS

PO #

	SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
1	689-15	55304.15	12/18/09	10:30	SOIL	4 VOAs 1 sleeve	ICE
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

ANALYSIS REQUESTED

	8015 EC	6010 Metals	8260 VOC's	8270 SVOC's		Archive				
1	X	X	X	X						

TEST INSTRUCTIONS & COMMENTS

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS	5	PROPERLY COOLED (Y) N / NA	
CUSTODY SEALS Y (N) NA		SAMPLES INTACT (Y) N / NA	
RECEIVED IN GOOD COND. (Y) N		SAMPLES ACCEPTED (Y) N	

TURN AROUND TIME

☒ NORMAL ☐ RUSH ☐ SAME DAY ☐ NEXT DAY ☐ 2 DAYS ☐ 3 DAYS

RELINQUISHED BY SAMPLER: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature:	Signature:	Signature:
Printed Name: William Ragsdale	Printed Name:	Printed Name: Chris Gonzales
Date: 12/18/09 Time: 1340	Date: Time:	Date: 12/18/09 Time: 1430
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY LABORATORY: 3.**
Signature:	Signature:	Signature:
Printed Name: Chris Gonzales	Printed Name:	Printed Name: Julian.
Date: 12/18/09 Time: 1340	Date: Time:	Date: 12/18/09 Time: 1430

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator

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ANALYTICAL RESULTS

Ordered By

Converse Consultants
185 E. Paularino Avenue
Suite B
Costa Mesa, CA 92626

Telephone: (714)444-9660
Attn: William Ragsdale
Page: **2**

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2

Our Lab I.D.			Method Blank	55304.02	55304.03	55304.05	55304.06
Client Sample I.D.				GP2-5	GP2-10	GP4-1	GP4-5
Date Sampled				12/18/2009	12/18/2009	12/18/2009	12/18/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	25	50	ND	ND	ND	ND	ND
Benzene	1.0	10.0	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND	ND	ND	ND
Bromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromodichloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	25	50	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	15	30	ND	ND	ND	ND	ND
2-Butanone (MEK)	25	50	ND	ND	ND	ND	ND
n-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Carbon Disulfide	25	50	ND	ND	ND	ND	ND
Carbon tetrachloride	5.0	10.0	ND	ND	ND	ND	ND
Chlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
Chloroethane	15	30	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50	50	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	5.0	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	15	30	ND	ND	ND	ND	ND
2-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	25	50	ND	ND	ND	ND	ND
Dibromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND	ND	ND	ND
Dibromomethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2

Our Lab I.D.			Method Blank	55304.02	55304.03	55304.05	55304.06
Client Sample I.D.				GP2-5	GP2-10	GP4-1	GP4-5
Date Sampled				12/18/2009	12/18/2009	12/18/2009	12/18/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Dichlorodifluoromethane	15	30	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
Ethylbenzene	1.0	10.0	ND	ND	ND	ND	ND
Hexachlorobutadiene	15	30	ND	ND	ND	ND	ND
2-Hexanone	25	50	ND	ND	ND	ND	ND
Iodomethane	5.0	10.0	ND	ND	ND	ND	ND
Isopropylbenzene	5.0	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND	ND	ND	ND
Methylene chloride (DCM)	25	50	ND	ND	ND	ND	ND
Naphthalene	5.0	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Styrene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
Tetrachloroethene	5.0	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	1.0	10.0	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
Trichloroethene	5.0	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2

Our Lab I.D.			Method Blank	55304.02	55304.03	55304.05	55304.06
Client Sample I.D.				GP2-5	GP2-10	GP4-1	GP4-5
Date Sampled				12/18/2009	12/18/2009	12/18/2009	12/18/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2,3-Trichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Vinyl Acetate	25	50	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	15	30	ND	ND	ND	ND	ND
o-Xylene	1.0	10.0	ND	ND	ND	ND	ND
m,p-Xylenes	1.0	20.0	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	55304.02	55304.03	55304.05	55304.06
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Bromofluorobenzene	75-125		112	112	110	112	113
Dibromofluoromethane	75-125		109	103	105	104	106
Toluene-d8	75-125		89.6	91.0	91.8	93.2	91.5

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ANALYTICAL RESULTS

Ordered By

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Page: **5**

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1222093A1

Our Lab I.D.			Method Blank	55304.09	55304.11	55304.13	55304.15
Client Sample I.D.				GP5-5	GP5-15	GP9-5	GP9-15
Date Sampled				12/18/2009	12/18/2009	12/18/2009	12/18/2009
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	25	50	ND	ND	ND	ND	ND
Benzene	1.0	10.0	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND	ND	ND	ND
Bromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromodichloromethane	5.0	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	25	50	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	15	30	ND	ND	ND	ND	ND
2-Butanone (MEK)	25	50	ND	ND	ND	ND	ND
n-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Carbon Disulfide	25	50	ND	ND	ND	ND	ND
Carbon tetrachloride	5.0	10.0	ND	ND	ND	ND	ND
Chlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
Chloroethane	15	30	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50	50	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	5.0	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	15	30	ND	ND	ND	ND	ND
2-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Chlorotoluene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	25	50	ND	ND	ND	ND	ND
Dibromochloromethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND	ND	ND	ND
Dibromomethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1222093A1

Our Lab I.D.			Method Blank	55304.09	55304.11	55304.13	55304.15
Client Sample I.D.				GP5-5	GP5-15	GP9-5	GP9-15
Date Sampled				12/18/2009	12/18/2009	12/18/2009	12/18/2009
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Dichlorodifluoromethane	15	30	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5.0	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5.0	10.0	ND	ND	ND	ND	ND
Ethylbenzene	1.0	10.0	ND	ND	ND	ND	ND
Hexachlorobutadiene	15	30	ND	ND	ND	ND	ND
2-Hexanone	25	50	ND	ND	ND	ND	ND
Iodomethane	5.0	10.0	ND	ND	ND	ND	ND
Isopropylbenzene	5.0	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene	5.0	10.0	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND	ND	ND	ND
Methylene chloride (DCM)	25	50	ND	ND	ND	ND	ND
Naphthalene	5.0	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Styrene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND	ND	ND	ND
Tetrachloroethene	5.0	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	1.0	10.0	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.0	10.0	ND	ND	ND	ND	ND
Trichloroethene	5.0	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	5.0	10.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1222093A1

Our Lab I.D.			Method Blank	55304.09	55304.11	55304.13	55304.15
Client Sample I.D.				GP5-5	GP5-15	GP9-5	GP9-15
Date Sampled				12/18/2009	12/18/2009	12/18/2009	12/18/2009
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2,3-Trichloropropane	5.0	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND	ND	ND	ND
Vinyl Acetate	25	50	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	15	30	ND	ND	ND	ND	ND
o-Xylene	1.0	10.0	ND	ND	ND	ND	ND
m,p-Xylenes	1.0	20.0	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	55304.09	55304.11	55304.13	55304.15
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Bromofluorobenzene	75-125		110	109	111	111	109
Dibromofluoromethane	75-125		104	104	104	100	102
Toluene-d8	75-125		90.3	89.8	90.3	93.2	91.8

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ANALYTICAL RESULTS

Ordered By

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Telephone: (714)444-9660
Attn: William Ragsdale
Page: 8

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 122209NB1

Our Lab I.D.			Method Blank	55304.02	55304.03	55304.05	55304.06
Client Sample I.D.				GP2-5	GP2-10	GP4-1	GP4-5
Date Sampled				12/18/2009	12/18/2009	12/18/2009	12/18/2009
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Preparation Method			5035A	5035A	5035A	5035A	5035A
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	12/22/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH as Gasoline and Light HC. (C4-C12)	0.100	1.000	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	55304.02	55304.03	55304.05	55304.06
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Bromofluorobenzene	75-125		107	97.2	103	109	107

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 122209NB1

Our Lab I.D.			55304.09	55304.11	55304.13	55304.15	
Client Sample I.D.			GP5-5	GP5-15	GP9-5	GP9-15	
Date Sampled			12/18/2009	12/18/2009	12/18/2009	12/18/2009	
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	
Preparation Method			5035A	5035A	5035A	5035A	
Date Analyzed			12/22/2009	12/22/2009	12/22/2009	12/22/2009	
Matrix			Soil	Soil	Soil	Soil	
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
TPH as Gasoline and Light HC. (C4-C12)	0.100	1.000	ND	ND	ND	ND	
Our Lab I.D.			55304.09	55304.11	55304.13	55304.15	
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.	% Rec.	
Bromofluorobenzene	75-125		104	105	108	94.8	

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 122109DB1

Our Lab I.D.			Method Blank	**55304.02**	**55304.03**	**55304.05**	**55304.06**
Client Sample I.D.				GP2-5	GP2-10	GP4-1	GP4-5
Date Sampled				12/18/2009	12/18/2009	12/18/2009	12/18/2009
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	12/21/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH as Diesel (C13-C22)	1.0	5.0	ND	ND	ND	ND	ND
TPH as Heavy Hydrocarbons (C23-C40)	1.0	5.0	ND	ND	ND	ND	ND
TPH Total as Diesel and Heavy HC.C13-C40	1.0	5.0	ND	ND	ND	ND	ND
Our Lab I.D.			Method Blank	**55304.02**	**55304.03**	**55304.05**	**55304.06**
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Chlorobenzene	75-125		87.0	90.0	93.4	85.2	92.8

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14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 122109DB1

Our Lab I.D.			**55304.09**	**55304.11**	**55304.13**	**55304.15**	
Client Sample I.D.			GP5-5	GP5-15	GP9-5	GP9-15	
Date Sampled			12/18/2009	12/18/2009	12/18/2009	12/18/2009	
Date Prepared			12/21/2009	12/21/2009	12/21/2009	12/21/2009	
Preparation Method			3550B	3550B	3550B	3550B	
Date Analyzed			12/21/2009	12/21/2009	12/21/2009	12/21/2009	
Matrix			Soil	Soil	Soil	Soil	
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
TPH as Diesel (C13-C22)	1.0	5.0	ND	ND	170	36.7	
TPH as Heavy Hydrocarbons (C23-C40)	1.0	5.0	ND	ND	906	941	
TPH Total as Diesel and Heavy HC.C13-C40	1.0	5.0	ND	ND	1,080	978	
Our Lab I.D.			**55304.09**	**55304.11**	**55304.13**	**55304.15**	
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
Chlorobenzene	75-125		101	91.1	90.6	92.5	

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14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			Method Blank	55304.02	55304.06	55304.15	
Client Sample I.D.				GP2-5	GP4-5	GP9-15	
Date Sampled				12/18/2009	12/18/2009	12/18/2009	
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	
Preparation Method			3550B	3550B	3550B	3550B	
Date Analyzed			12/22/2009	12/23/2009	12/23/2009	12/23/2009	
Matrix			Soil	Soil	Soil	Soil	
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
Acenaphthene	0.25	0.50	ND	ND	ND	ND	
Acenaphthylene	0.25	0.50	ND	ND	ND	ND	
Anthracene	0.25	0.50	ND	ND	ND	ND	
Azobenzene	0.25	0.50	ND	ND	ND	ND	
Benzidine	0.25	0.50	ND	ND	ND	ND	
Benzo(a)anthracene	0.25	0.50	ND	ND	ND	ND	
Benzo(a)pyrene	0.25	0.50	ND	ND	ND	ND	
Benzo(b)fluoranthene	0.25	0.50	ND	ND	ND	ND	
Benzo(g,h,i)perylene	0.25	0.50	ND	ND	ND	ND	
Benzo(k)fluoranthene	0.25	0.50	ND	ND	ND	ND	
Benzoic Acid	0.25	0.50	ND	ND	ND	ND	
Benzyl Alcohol	0.25	0.50	ND	ND	ND	ND	
Bis(2-Chloroethoxy)methane	0.25	0.50	ND	ND	ND	ND	
Bis(2-Chloroethyl)ether	0.25	0.50	ND	ND	ND	ND	
Bis(2-chloroisopropyl) ether	0.25	0.50	ND	ND	ND	ND	
Bis(2-ethylhexyl) phthalate	0.25	0.50	ND	ND	ND	ND	
4-Bromophenyl phenyl ether	0.25	0.50	ND	ND	ND	ND	
Butyl benzyl phthalate	0.25	0.50	ND	ND	ND	ND	
4-Chloro-3-methylphenol	0.25	0.50	ND	ND	ND	ND	
4-Chloroaniline	0.25	0.50	ND	ND	ND	ND	
2-Chloronaphthalene	0.25	0.50	ND	ND	ND	ND	
2-Chlorophenol	0.25	0.50	ND	ND	ND	ND	
4-Chlorophenyl phenyl ether	0.25	0.50	ND	ND	ND	ND	
Chrysene	0.25	0.50	ND	ND	ND	ND	
Di-n-butyl phthalate	0.25	0.50	ND	ND	ND	ND	
Di-n-octyl phthalate (Dioctyl ester)	0.25	0.50	ND	ND	ND	ND	
Dibenzo(a,h)anthracene	0.25	0.50	ND	ND	ND	ND	

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			Method Blank	55304.02	55304.06	55304.15	
Client Sample I.D.				GP2-5	GP4-5	GP9-15	
Date Sampled				12/18/2009	12/18/2009	12/18/2009	
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	
Preparation Method			3550B	3550B	3550B	3550B	
Date Analyzed			12/22/2009	12/23/2009	12/23/2009	12/23/2009	
Matrix			Soil	Soil	Soil	Soil	
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
Dibenzofuran	0.25	0.50	ND	ND	ND	ND	
1,2-Dichlorobenzene	0.25	0.50	ND	ND	ND	ND	
1,3-Dichlorobenzene	0.25	0.50	ND	ND	ND	ND	
1,4-Dichlorobenzene	0.25	0.50	ND	ND	ND	ND	
3,3'-Dichlorobenzidine	0.25	0.50	ND	ND	ND	ND	
2,4-Dichlorophenol	0.25	0.50	ND	ND	ND	ND	
Diethyl phthalate (Diethyl ester)	0.25	0.50	ND	ND	ND	ND	
Dimethyl phthalate (Dimethyl ester)	0.25	0.50	ND	ND	ND	ND	
2,4-Dimethylphenol	0.25	0.50	ND	ND	ND	ND	
4,6-Dinitro-2-methylphenol	0.25	0.50	ND	ND	ND	ND	
2,4-Dinitrophenol	0.25	0.50	ND	ND	ND	ND	
2,4-Dinitrotoluene	0.25	0.50	ND	ND	ND	ND	
2,6-Dinitrotoluene (2,6-DNT)	0.25	0.50	ND	ND	ND	ND	
Fluoranthene	0.25	0.50	ND	ND	ND	ND	
Fluorene	0.25	0.50	ND	ND	ND	ND	
Hexachlorobenzene	0.25	0.50	ND	ND	ND	ND	
Hexachlorobutadiene	0.25	0.50	ND	ND	ND	ND	
Hexachlorocyclopentadiene	0.25	0.50	ND	ND	ND	ND	
Hexachloroethane	0.25	0.50	ND	ND	ND	ND	
Indeno(1,2,3-cd)pyrene	0.25	0.50	ND	ND	ND	ND	
Isophorone	0.25	0.50	ND	ND	ND	ND	
2-Methylnaphthalene	0.25	0.50	ND	ND	ND	ND	
4-Methylphenol	0.25	0.50	ND	ND	ND	ND	
2-Methylphenol (2-Cresol)	0.25	0.50	ND	ND	ND	ND	
3-Methylphenol (3-Cresol)	0.25	0.50	ND	ND	ND	ND	
N-Nitroso-Di-n-propylamine	0.25	0.50	ND	ND	ND	ND	
Naphthalene	0.25	0.50	ND	ND	ND	ND	
2-Nitroaniline	0.25	0.50	ND	ND	ND	ND	
3-Nitroaniline	0.25	0.50	ND	ND	ND	ND	
4-Nitroaniline	0.25	0.50	ND	ND	ND	ND	
Nitrobenzene (NB)	0.25	0.50	ND	ND	ND	ND	
4-Nitrophenol	0.25	0.50	ND	ND	ND	ND	
2-Nitrophenol (o-Nitrophenol)	0.25	0.50	ND	ND	ND	ND	
N-nitrosodiphenylamine	0.25	0.50	ND	ND	ND	ND	

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			Method Blank	**55304.02**	**55304.06**	**55304.15**	
Client Sample I.D.				GP2-5	GP4-5	GP9-15	
Date Sampled				12/18/2009	12/18/2009	12/18/2009	
Date Prepared			12/22/2009	12/22/2009	12/22/2009	12/22/2009	
Preparation Method			3550B	3550B	3550B	3550B	
Date Analyzed			12/22/2009	12/23/2009	12/23/2009	12/23/2009	
Matrix			Soil	Soil	Soil	Soil	
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
Pentachlorophenol	0.25	0.50	ND	ND	ND	ND	
Phenanthrene	0.25	0.50	ND	ND	ND	ND	
Phenol	0.25	0.50	ND	ND	ND	ND	
Pyrene	0.25	0.50	ND	ND	ND	ND	
1,2,4-Trichlorobenzene	0.25	0.50	ND	ND	ND	ND	
2,4,5-Trichlorophenol	0.25	0.50	ND	ND	ND	ND	
2,4,6-Trichlorophenol	0.25	0.50	ND	ND	ND	ND	
Our Lab I.D.			Method Blank	**55304.02**	**55304.06**	**55304.15**	
Surrogates	**%Rec.Limit**		**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
2-Fluorophenol	25-121		69.2	80.7	90.9	70.2	
2-Fluorobiphenyl	30-115		80.8	85.7	100	81.2	
Nitrobenzene-d5	23-120		72.4	81.2	94.2	72.8	
Phenol-d6	21-113		70.8	77.2	90.9	69.6	
p-Terphenyl-D14	18-137		82.8	88.7	104	78.4	
2,4,6-Tribromophenol	19-122		83.0	91.1	110	88.2	

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14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			55304.13				
Client Sample I.D.			GP9-5				
Date Sampled			12/18/2009				
Date Prepared			12/22/2009				
Preparation Method			3550B				
Date Analyzed			12/22/2009				
Matrix			Soil				
Units			mg/Kg				
Dilution Factor			2				
Analytes	**MDL**	**PQL**	**Results**				
Acenaphthene	0.50	1.00	ND				
Acenaphthylene	0.50	1.00	ND				
Anthracene	0.50	1.00	ND				
Azobenzene	0.50	1.00	ND				
Benzidine	0.50	1.00	ND				
Benzo(a)anthracene	0.50	1.00	ND				
Benzo(a)pyrene	0.50	1.00	ND				
Benzo(b)fluoranthene	0.50	1.00	ND				
Benzo(g,h,i)perylene	0.50	1.00	ND				
Benzo(k)fluoranthene	0.50	1.00	ND				
Benzoic Acid	0.50	1.00	ND				
Benzyl Alcohol	0.50	1.00	ND				
Bis(2-Chloroethoxy)methane	0.50	1.00	ND				
Bis(2-Chloroethyl)ether	0.50	1.00	ND				
Bis(2-chloroisopropyl) ether	0.50	1.00	ND				
Bis(2-ethylhexyl) phthalate	0.50	1.00	2.69				
4-Bromophenyl phenyl ether	0.50	1.00	ND				
Butyl benzyl phthalate	0.50	1.00	ND				
4-Chloro-3-methylphenol	0.50	1.00	ND				
4-Chloroaniline	0.50	1.00	ND				
2-Chloronaphthalene	0.50	1.00	ND				
2-Chlorophenol	0.50	1.00	ND				
4-Chlorophenyl phenyl ether	0.50	1.00	ND				
Chrysene	0.50	1.00	ND				
Di-n-butyl phthalate	0.50	1.00	ND				
Di-n-octyl phthalate (Dioctyl ester)	0.50	1.00	ND				
Dibenzo(a,h)anthracene	0.50	1.00	ND				

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			55304.13				
Client Sample I.D.			GP9-5				
Date Sampled			12/18/2009				
Date Prepared			12/22/2009				
Preparation Method			3550B				
Date Analyzed			12/22/2009				
Matrix			Soil				
Units			mg/Kg				
Dilution Factor			2				
Analytes	**MDL**	**PQL**	**Results**				
Dibenzofuran	0.50	1.00	ND				
1,2-Dichlorobenzene	0.50	1.00	ND				
1,3-Dichlorobenzene	0.50	1.00	ND				
1,4-Dichlorobenzene	0.50	1.00	ND				
3,3'-Dichlorobenzidine	0.50	1.00	ND				
2,4-Dichlorophenol	0.50	1.00	ND				
Diethyl phthalate (Diethyl ester)	0.50	1.00	ND				
Dimethyl phthalate (Dimethyl ester)	0.50	1.00	ND				
2,4-Dimethylphenol	0.50	1.00	ND				
4,6-Dinitro-2-methylphenol	0.50	1.00	ND				
2,4-Dinitrophenol	0.50	1.00	ND				
2,4-Dinitrotoluene	0.50	1.00	ND				
2,6-Dinitrotoluene (2,6-DNT)	0.50	1.00	ND				
Fluoranthene	0.50	1.00	ND				
Fluorene	0.50	1.00	ND				
Hexachlorobenzene	0.50	1.00	ND				
Hexachlorobutadiene	0.50	1.00	ND				
Hexachlorocyclopentadiene	0.50	1.00	ND				
Hexachloroethane	0.50	1.00	ND				
Indeno(1,2,3-cd)pyrene	0.50	1.00	ND				
Isophorone	0.50	1.00	ND				
2-Methylnaphthalene	0.50	1.00	ND				
4-Methylphenol	0.50	1.00	ND				
2-Methylphenol (2-Cresol)	0.50	1.00	ND				
3-Methylphenol (3-Cresol)	0.50	1.00	ND				
N-Nitroso-Di-n-propylamine	0.50	1.00	ND				
Naphthalene	0.50	1.00	ND				
2-Nitroaniline	0.50	1.00	ND				
3-Nitroaniline	0.50	1.00	ND				
4-Nitroaniline	0.50	1.00	ND				
Nitrobenzene (NB)	0.50	1.00	ND				
4-Nitrophenol	0.50	1.00	ND				
2-Nitrophenol (o-Nitrophenol)	0.50	1.00	ND				
N-nitrosodiphenylamine	0.50	1.00	ND				

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ANALYTICAL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1

Our Lab I.D.			**55304.13**				
Client Sample I.D.			GP9-5				
Date Sampled			12/18/2009				
Date Prepared			12/22/2009				
Preparation Method			3550B				
Date Analyzed			12/22/2009				
Matrix			Soil				
Units			mg/Kg				
Dilution Factor			2				
Analytes	**MDL**	**PQL**	**Results**				
Pentachlorophenol	0.50	1.00	ND				
Phenanthrene	0.50	1.00	ND				
Phenol	0.50	1.00	ND				
Pyrene	0.50	1.00	ND				
1,2,4-Trichlorobenzene	0.50	1.00	ND				
2,4,5-Trichlorophenol	0.50	1.00	ND				
2,4,6-Trichlorophenol	0.50	1.00	ND				
Our Lab I.D.			**55304.13**				
Surrogates	**%Rec.Limit**		**% Rec.**				
2-Fluorophenol	25-121		44.8				
2-Fluorobiphenyl	30-115		64.2				
Nitrobenzene-d5	23-120		58.0				
Phenol-d6	21-113		31.7				
p-Terphenyl-D14	18-137		65.6				
2,4,6-Tribromophenol	19-122		65.9				

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (6010B/7000CAM), CAM Title 22 Metals (SW-846)

QC Batch No: 122309-1

Our Lab I.D.			Method Blank	55304.02	55304.03	55304.05	55304.06
Client Sample I.D.				GP2-5	GP2-10	GP4-1	GP4-5
Date Sampled				12/18/2009	12/18/2009	12/18/2009	12/18/2009
Date Prepared			12/23/2009	12/23/2009	12/23/2009	12/23/2009	12/23/2009
Preparation Method			3050B	3050B	3050B	3050B	3050B
Date Analyzed			12/23/2009	12/23/2009	12/23/2009	12/23/2009	12/23/2009
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Antimony	1.0	5.0	ND	1.35J	1.00J	ND	ND
Arsenic	1.0	5.0	ND	ND	ND	1.60J	2.20J
Barium	2.5	5.0	ND	43.0	41.8	97.9	25.2
Beryllium	1.3	2.5	ND	ND	ND	ND	ND
Cadmium	1.3	2.5	ND	ND	ND	1.35J	ND
Chromium	2.5	5.0	ND	ND	3.40J	14.1	6.20
Cobalt	2.5	5.0	ND	ND	3.45J	8.35	2.75J
Copper	2.5	5.0	ND	ND	9.00	19.1	ND
Lead	2.5	5.0	ND	ND	ND	14.2	9.90
Mercury (By EPA 7471)	0.1	0.2	ND	ND	ND	ND	ND
Molybdenum	2.5	5.0	ND	ND	ND	ND	ND
Nickel	2.5	5.0	ND	ND	2.70J	11.2	6.95
Selenium	1.0	5.0	ND	ND	ND	ND	ND
Silver	2.5	5.0	ND	ND	ND	ND	ND
Thallium	1.0	5.0	ND	ND	ND	ND	ND
Vanadium	2.5	5.0	ND	39.0	9.85	26.2	5.65
Zinc	2.5	5.0	ND	45.0	18.1	85.8	23.8

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (6010B/7000CAM), CAM Title 22 Metals (SW-846)

QC Batch No: 122309-1

Our Lab I.D.			55304.09	55304.11	55304.13	55304.15	
Client Sample I.D.			GP5-5	GP5-15	GP9-5	GP9-15	
Date Sampled			12/18/2009	12/18/2009	12/18/2009	12/18/2009	
Date Prepared			12/23/2009	12/23/2009	12/23/2009	12/23/2009	
Preparation Method			3050B	3050B	3050B	3050B	
Date Analyzed			12/23/2009	12/23/2009	12/23/2009	12/23/2009	
Matrix			Soil	Soil	Soil	Soil	
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Dilution Factor			1	1	1	1	
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	
Antimony	1.0	5.0	ND	ND	ND	ND	
Arsenic	1.0	5.0	2.50J	ND	ND	ND	
Barium	2.5	5.0	107	51.7	56.1	51.4	
Beryllium	1.3	2.5	ND	ND	ND	ND	
Cadmium	1.3	2.5	ND	ND	ND	ND	
Chromium	2.5	5.0	14.2	5.80	10.1	6.75	
Cobalt	2.5	5.0	8.50	3.85J	5.85	3.95J	
Copper	2.5	5.0	17.5	7.80	15.4	7.00	
Lead	2.5	5.0	ND	ND	11.1	ND	
Mercury (By EPA 7471)	0.1	0.2	ND	ND	ND	ND	
Molybdenum	2.5	5.0	ND	ND	ND	ND	
Nickel	2.5	5.0	11.2	3.70J	7.70	6.25	
Selenium	1.0	5.0	ND	ND	ND	ND	
Silver	2.5	5.0	ND	ND	ND	ND	
Thallium	1.0	5.0	ND	ND	ND	ND	
Vanadium	2.5	5.0	27.5	12.9	20.1	11.5	
Zinc	2.5	5.0	46.0	32.8	54.8	27.6	

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (6010B/7000CAM), CAM Title 22 Metals (SW-846)

QC Batch No: 122309-1; Dup or Spiked Sample: 55304.02; LCS: Clean Sand; QC Prepared: 12/23/2009; QC Analyzed: 12/23/2009; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Antimony	1.35	50.0	53.4	104	50.0	54.4	106	1.9	80-120	<15
Arsenic	ND	50.0	56.0	112	50.0	56.5	113	<1	80-120	<15
Barium	43.0	50.0	99.5	113	50.0	99.0	112	<1	80-120	<15
Beryllium	ND	50.0	57.0	114	50.0	57.5	115	<1	80-120	<15
Cadmium	ND	50.0	54.5	109	50.0	54.5	109	<1	80-120	<15
Chromium	ND	50.0	56.0	112	50.0	56.0	112	<1	80-120	<15
Cobalt	ND	50.0	55.0	110	50.0	54.5	109	<1	80-120	<15
Copper	ND	50.0	55.0	110	50.0	55.0	110	<1	80-120	<15
Lead	ND	50.0	52.5	105	50.0	53.0	106	<1	80-120	<15
Mercury (By EPA 7471)	ND	50.0	50.5	101	50.0	49.6	99.2	1.8	80-120	<15
Molybdenum	ND	50.0	56.0	112	50.0	56.5	113	<1	80-120	<15
Nickel	ND	50.0	53.5	107	50.0	53.5	107	<1	80-120	<15
Selenium	ND	50.0	54.5	109	50.0	55.0	110	<1	80-120	<15
Silver	ND	50.0	55.5	111	50.0	55.5	111	<1	80-120	<15
Thallium	ND	50.0	52.0	104	50.0	52.5	105	<1	80-120	<15
Vanadium	3.90	50.0	59.4	111	50.0	59.4	111	<1	80-120	<15
Zinc	45.0	50.0	98.0	106	50.0	97.5	105	<1	80-120	<15

QC Batch No: 122309-1; Dup or Spiked Sample: 55304.02; LCS: Clean Sand; QC Prepared: 12/23/2009; QC Analyzed: 12/23/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Antimony	50.0	50.0	100	80-120						
Arsenic	50.0	56.0	112	80-120						
Barium	50.0	57.0	114	80-120						
Beryllium	50.0	57.0	114	80-120						
Cadmium	50.0	57.5	115	80-120						
Chromium	50.0	0.500	1.0	80-120						
Cobalt	50.0	56.5	113	80-120						
Copper	50.0	54.5	109	80-120						
Lead	50.0	55.0	110	80-120						

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Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (6010B/7000CAM), CAM Title 22 Metals (SW-846)

QC Batch No: 122309-1; Dup or Spiked Sample: 55304.02; LCS: Clean Sand; QC Prepared: 12/23/2009; QC Analyzed: 12/23/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Mercury (By EPA 7471)	50.0	48.2	96.4	80-120						
Molybdenum	50.0	56.0	112	80-120						
Nickel	50.0	56.0	112	80-120						
Selenium	50.0	55.0	110	80-120						
Silver	50.0	54.5	109	80-120						
Thallium	50.0	56.0	112	80-120						
Vanadium	50.0	56.5	113	80-120						
Zinc	50.0	57.5	115	80-120						

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1221093A2; Dup or Spiked Sample: B1221093A2; LCS: Clean Sand; QC Prepared: 12/21/2009; QC Analyzed: 12/21/2009; Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.00	50.0	59.5	119	50.0	60.0	120	<1	75-125	<20
Chlorobenzene	0.00	50.0	42.5	85.0	50.0	43.3	86.6	1.86	75-125	<20
1,1-Dichloroethene	0.00	50.0	59.5	119	50.0	54.5	109	8.77	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.00	50.0	61.5	123	50.0	56.5	113	8.47	75-125	<20
Toluene (Methyl benzene)	0.00	50.0	46.3	92.6	50.0	47.2	94.4	1.93	75-125	<20
Trichloroethene	0.00	50.0	58.5	117	50.0	60.5	121	3.36	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	50.0	50.0	100	50.0	49.8	99.6	<1	75-125	<20
Dibromofluoromethane	0.00	50.0	55.0	110	50.0	55.0	110	<1	75-125	<20
Toluene-d8	0.00	50.0	41.7	83.3	50.0	41.9	83.8	<1	75-125	<20

QC Batch No: 1221093A2; Dup or Spiked Sample: B1221093A2; LCS: Clean Sand; QC Prepared: 12/21/2009; QC Analyzed: 12/21/2009; Units: ug/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Benzene	50.0	60.5	121	75-125						
Chlorobenzene	50.0	43.3	86.6	75-125						
1,1-Dichloroethene	50.0	55.3	111	75-125						
Methyl-tert-butyl ether (MTBE)	50.0	56.9	114	75-125						
Toluene (Methyl benzene)	50.0	47.1	94.2	75-125						
Trichloroethene	50.0	59.6	119	75-125						
LCS										
Chloroform (Trichloromethane)	50.0	56.1	112	75-125						
Ethylbenzene	50.0	50.2	100	75-125						
1,1,1-Trichloroethane	50.0	56.7	113	75-125						
o-Xylene	50.0	48.1	96.2	75-125						
m,p-Xylenes	100	95.0	95.0	75-125						
Surrogates										
Bromofluorobenzene	50.0	49.9	99.7	75-125						
Dibromofluoromethane	50.0	55.3	111	75-125						
Toluene-d8	50.0	42.2	84.4	75-125						

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Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 1222093A1; Dup or Spiked Sample: B1222093A1; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.00	50.0	56.5	113	50.0	55.0	110	2.69	75-125	<20
Chlorobenzene	0.00	50.0	42.1	84.2	50.0	40.5	81.0	3.87	75-125	<20
1,1-Dichloroethene	0.00	50.0	58.0	116	50.0	61.5	123	5.86	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.00	50.0	61.5	123	50.0	61.5	123	<1	75-125	<20
Toluene (Methyl benzene)	0.00	50.0	45.9	91.8	50.0	44.2	88.4	3.77	75-125	<20
Trichloroethene	0.00	50.0	56.0	112	50.0	55.0	110	1.80	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	50.0	48.9	97.8	50.0	49.5	98.9	1.12	75-125	<20
Dibromofluoromethane	0.00	50.0	53.0	106	50.0	53.0	106	<1	75-125	<20
Toluene-d8	0.00	50.0	42.5	85.0	50.0	42.8	85.5	<1	75-125	<20

QC Batch No: 1222093A1; Dup or Spiked Sample: B1222093A1; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: ug/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Benzene	50.0	55.8	112	75-125						
Chlorobenzene	50.0	41.0	82.0	75-125						
1,1-Dichloroethene	50.0	57.2	114	75-125						
Methyl-tert-butyl ether (MTBE)	50.0	59.3	119	75-125						
Toluene (Methyl benzene)	50.0	45.0	90.0	75-125						
Trichloroethene	50.0	56.7	113	75-125						
LCS										
Chloroform (Trichloromethane)	50.0	57.4	115	75-125						
Ethylbenzene	50.0	47.8	95.6	75-125						
1,1,1-Trichloroethane	50.0	58.7	117	75-125						
o-Xylene	50.0	45.1	90.2	75-125						
m,p-Xylenes	100	89.7	89.7	75-125						
Surrogates										
Bromofluorobenzene	50.0	48.9	97.8	75-125						
Dibromofluoromethane	50.0	54.6	109	75-125						
Toluene-d8	50.0	42.3	84.6	75-125						

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Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1; Dup or Spiked Sample: 55293.06; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Acenaphthene	0.00	5.00	3.77	75.4	5.00	4.13	82.6	9.1	46-118	<20
4-Chloro-3-methylphenol	0.00	10.0	8.66	86.6	10.0	8.70	87.0	<1	39-98	<20
2-Chlorophenol	0.00	10.0	7.55	75.5	10.0	8.14	81.4	7.5	27-123	<20
1,4-Dichlorobenzene	0.00	5.00	3.65	73.0	5.00	3.96	79.2	8.1	36-97	<20
2,4-Dinitrotoluene	0.00	5.00	4.08	81.6	5.00	4.19	83.8	2.7	24-96	<20
N-Nitroso-Di-n-propylamine	0.00	5.00	4.49	89.8	5.00	4.42	88.4	1.6	41-116	<20
4-Nitrophenol	0.00	10.0	8.00	80.0	10.0	7.92	79.2	1.0	10-80	<20
Pentachlorophenol	0.00	10.0	8.31	83.1	10.0	9.53	95.3	13.7	40-125	<20
Phenol	0.00	10.0	7.66	76.6	10.0	8.44	84.4	9.7	12-89	<20
Pyrene	0.00	5.00	3.83	76.6	5.00	4.43	88.6	14.5	26-127	<20
1,2,4-Trichlorobenzene	0.00	5.00	3.78	75.6	5.00	4.24	84.8	11.5	39-98	<20
Surrogates										
2-Fluorophenol	0.00	5.00	3.40	68.0	5.00	3.89	77.8	13.4	25-121	<20
2-Fluorobiphenyl	0.00	2.50	1.94	77.6	2.50	2.18	87.2	11.7	30-115	<20
Nitrobenzene-d5	0.00	2.50	1.88	75.2	2.50	2.04	81.6	8.2	23-120	<20
p-Terphenyl-D14	0.00	2.50	1.92	76.8	2.50	2.25	90.0	15.8	18-137	<20
Phenol-d6	0.00	5.00	3.75	75.0	5.00	4.08	81.6	8.4	24-113	<20
2,4,6-Tribromophenol	0.00	5.00	4.29	85.8	5.00	4.79	95.8	11.0	19-122	<20

QC Batch No: 122209KB1; Dup or Spiked Sample: 55293.06; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Acenaphthene	5.00	4.42	88.4	31-137						
4-Chloro-3-methylphenol	10.0	9.22	92.2	40-99						
2-Chlorophenol	10.0	8.59	85.9	25-102						
1,4-Dichlorobenzene	5.00	4.22	84.4	28-104						
2,4-Dinitrotoluene	5.00	4.55	91.0	28-89						
N-Nitroso-Di-n-propylamine	5.00	4.89	97.8	41-126						
4-Nitrophenol	10.0	7.97	79.7	11-114						
Pentachlorophenol	10.0	8.78	87.8	17-125						

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QUALITY CONTROL RESULTS

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (8270C), Semivolatile Organic Compounds by GC/MS (SW-846)

QC Batch No: 122209KB1; Dup or Spiked Sample: 55293.06; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/22/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Phenol	10.0	8.78	87.8	26-90						
Pyrene	5.00	4.42	88.4	35-142						
1,2,4-Trichlorobenzene	5.00	4.35	87.0	38-107						
Surrogates										
2-Fluorophenol	5.00	3.89	77.8	25-121						
2-Fluorobiphenyl	2.50	2.12	84.8	30-115						
Nitrobenzene-d5	2.50	2.00	80.0	23-120						
p-Terphenyl-D14	2.50	2.13	85.2	18-137						
Phenol-d6	5.00	4.06	81.2	24-113						
2,4,6-Tribromophenol	5.00	4.38	87.6	19-122						

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QUALITY CONTROL RESULTS

Ordered By

Converse Consultants
185 E. Paularino Avenue
Suite B
Costa Mesa, CA 92626

Telephone: (714)444-9660
Attn: William Ragsdale
Page: **26**

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 122109DB1; Dup or Spiked Sample: 55304.02; LCS: Clean Sand; QC Prepared: 12/21/2009;MS Analyzed: 12/21/2009; LCS Analyzed: 12/22/2009; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
TPH as Diesel (C13-C22)	0.00	500	510	102	500	527	105	2.90	75-125	<20
Surrogates										
Chlorobenzene	0.00	100	82.9	82.9	100	83.0	83.0	<1	75-125	<20

QC Batch No: 122109DB1; Dup or Spiked Sample: 55304.02; LCS: Clean Sand; QC Prepared: 12/21/2009;MS Analyzed: 12/21/2009; LCS Analyzed: 12/22/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
TPH as Diesel (C13-C22)	500	518	104	75-125						
Surrogates										
Chlorobenzene	100	87.9	87.9	75-125						

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QUALITY CONTROL RESULTS

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Telephone: (714)444-9660
Attn: William Ragsdale
Page: **27**

Site

14041 Live Oak Avenue
Irwindale, CA 91706

Project ID: 09-42-138-02
Project Name: 17 Acre Lot

AETL Job Number	Submitted	Client
55304	12/18/2009	CONVRS

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 122209NB1; Dup or Spiked Sample: 55304.02; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/23/2009; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
TPH as Gasoline and Light HC. (C4-C12)	0.00	2.50	2.44	97.6	2.50	2.50	100	2.43	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	0.0500	0.0529	106	0.0500	0.0538	108	1.89	75-125	<20

QC Batch No: 122209NB1; Dup or Spiked Sample: 55304.02; LCS: Clean Sand; QC Prepared: 12/22/2009; QC Analyzed: 12/23/2009; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
TPH as Gasoline and Light HC. (C4-C12)	2.50	2.46	98.4	75-125						
Surrogates										
Bromofluorobenzene	0.0500	0.0529	106	75-125						

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Data Qualifiers and Descriptors

Data Qualifier:

*:	In the QC section, sample results have been taken directly from the ICP reading. No preparation factor has been applied.
B:	Analyte was present in the Method Blank.
D:	Result is from a diluted analysis.
E:	Result is beyond calibration limits and is estimated.
H:	Analysis was performed over the allowed holding time due to circumstances which were beyond laboratory control.
J:	Analyte was detected . However, the analyte concentration is an estimated value, which is between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL).
M:	Matrix spike recovery is outside control limits due to matrix interference. Laboratory Control Sample recovery was acceptable.
MCL:	Maximum Contaminant Level
NS:	No Standard Available
S6:	Surrogate recovery is outside control limits due to matrix interference.
S8:	The analysis of the sample required a dilution such that the surrogate concentration was diluted below the method acceptance criteria.
X:	Results represent LCS and LCSD data.

Definition:

%Limi:	Percent acceptable limits.
%REC:	Percent recovery.
Con.L:	Acceptable Control Limits
Conce:	Added concentration to the sample.
LCS:	Laboratory Control Sample
MDL:	Method Detection Limit is a statistically derived number which is specific for each instrument, each method, and each compound. It indicates a distinctively detectable quantity with 99% probability.

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Data Qualifiers and Descriptors

MS:	Matrix Spike
MS DU:	Matrix Spike Duplicate
ND:	Analyte was not detected in the sample at or above MDL.
PQL:	Practical Quantitation Limit or ML (Minimum Level as per RWQCB) is the minimum concentration that can be quantified with more than 99% confidence. Taking into account all aspects of the entire analytical instrumentation and practice.
Recov:	Recovered concentration in the sample.
RPD:	Relative Percent Difference

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JONES ENVIRONMENTAL

LABORATORY REPORT

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

ANALYSES REQUESTED

1. EPA 8260B- Volatile Organics by GC/MS + Oxygenates

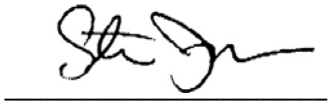
Sampling – Soil Gas samples are collected in glass gas-tight syringes equipped with Teflon plungers. Tubing placed in the ground for soil gas sampling is purged three different times as recommended by DTSC/RWQCB regulations. This purge test determines how many purges of the soil gas tubing are needed throughout the project. One, three and seven purge volumes were analyzed to make this determination.

A tracer gas, n-Propanol, was placed at the tubing-surface interface before sampling. This compound is analyzed during the 8260B analytical run to determine if there are surface leaks into the subsurface due to improper installation of the probe. No n-Propanol was found in any of the samples reported herein.

The sampling rate was approximately 200 cc/min except when noted differently on the chain of custody record using a gas tight syringe. 3 purge volumes were used since this purging level gave the highest results for the compound(s) of greatest interest.

Analytical – Soil Gas samples were analyzed using EPA Method 8260 that includes extra compounds required by DTSC/RWQCB (such as Freon 113). Instrument Continuing Calibration Verification , QC Reference Standards, Instrument Blanks and Ambient Air Blanks are analyzed every 12 hours as prescribed by the method. In addition, Matrix Spike (MS) and Matrix Spike Duplicates (MSD) are analyzed with each batch of Soil Gas samples. A duplicate sample is analyzed each day of the sampling activity.

All samples were analyzed within 30 minutes of sampling.

Approval: 

Steve Jones, Ph.D.
Laboratory Manager

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-A-10 1P	GP-9-A-10 3P	GP-9-A-10 7P	GP-9-A-5	GP-9-A-20 3P	**Practical Quantitation Limits**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromodichloromethane	ND	ND	ND	ND	ND	20	ug/M^3
Bromoform	ND	ND	ND	ND	ND	20	ug/M^3
n-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
sec-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon tetrachloride	ND	ND	ND	ND	ND	20	ug/M^3
Chlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Chloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Chloroform	ND	ND	ND	ND	ND	20	ug/M^3
Chloromethane	ND	ND	ND	ND	ND	20	ug/M^3
2-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
4-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
Dibromochloromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	20	ug/M^3
Dibromomethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Dichlorodifluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-A-10 1P	GP-9-A-10 3P	GP-9-A-10 7P	GP-9-A-5	GP-9-A-20 3P	**Practical Quantitation Limits**	**Units**
Analytes:							
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
2,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
Ethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Freon 113	ND	ND	ND	ND	ND	20	ug/M^3
Hexachlorobutadiene	ND	ND	ND	ND	ND	20	ug/M^3
Isopropylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
4-Isopropyltoluene	ND	ND	ND	ND	ND	20	ug/M^3
Methylene chloride	ND	ND	ND	ND	ND	20	ug/M^3
Naphthalene	ND	ND	ND	ND	ND	20	ug/M^3
n-Propylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Styrene	**121**	**134**	**115**	**247**	**280**	20	ug/M^3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Tetrachloroethylene	ND	ND	ND	ND	ND	20	ug/M^3
Toluene	ND	ND	ND	**66**	**79**	20	ug/M^3
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Trichloroethylene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-A-10 1P	GP-9-A-10 3P	GP-9-A-10 7P	GP-9-A-5	GP-9-A-20 3P	**Practical Quantitation Limits**	**Units**
Analytes:							
Trichlorofluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Vinyl chloride	ND	ND	ND	ND	ND	20	ug/M^3
Xylenes	ND	ND	ND	ND	**60**	20	ug/M^3
MTBE	ND	ND	ND	ND	ND	20	ug/M^3
Ethyl-tert-butylether	ND	ND	ND	ND	ND	20	ug/M^3
Di-isopropylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-amylmethylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylalcohol	ND	ND	ND	ND	ND	100	ug/M^3
TIC							
n-Propanol	ND	ND	ND	ND	ND	20	ug/M^3
Acetone	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Butadiene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon Disulfide	ND	ND	ND	ND	ND	20	ug/M^3
Heptane	ND	ND	ND	ND	ND	20	ug/M^3
2-Butanone (MEK)	ND	ND	ND	ND	**374**	20	ug/M^3
Dilution Factor	1	1	1	1	1		
Surrogate Recovery :						**QC Limits**	
Dibromofluoromethane	107%	109%	102%	108%	114%	60 - 140	
Toluene-d_8	98%	98%	93%	98%	108%	60 - 140	
4-Bromofluorobenzene	112%	115%	115%	100%	99%	60 - 140	

ND = Not Detected

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LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-A-20 DUP	GP-9-A-20 1P	GP-9-A-20 7P	GP-9-C-5	GP-9-C-10	**Practical Quantitation Limits**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	**241**	20	ug/M^3
Bromobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromodichloromethane	ND	ND	ND	ND	ND	20	ug/M^3
Bromoform	ND	ND	ND	ND	ND	20	ug/M^3
n-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
sec-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon tetrachloride	ND	ND	ND	ND	ND	20	ug/M^3
Chlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Chloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Chloroform	ND	ND	ND	ND	ND	20	ug/M^3
Chloromethane	ND	ND	ND	ND	ND	20	ug/M^3
2-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
4-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
Dibromochloromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	20	ug/M^3
Dibromomethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Dichlorodifluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-A-20 DUP	GP-9-A-20 1P	GP-9-A-20 7P	GP-9-C-5	GP-9-C-10	**Practical Quantitation Limits**	**Units**
Analytes:							
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
2,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
Ethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Freon 113	ND	ND	ND	ND	ND	20	ug/M^3
Hexachlorobutadiene	ND	ND	ND	ND	ND	20	ug/M^3
Isopropylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
4-Isopropyltoluene	ND	ND	ND	ND	ND	20	ug/M^3
Methylene chloride	ND	ND	ND	ND	ND	20	ug/M^3
Naphthalene	ND	ND	ND	ND	ND	20	ug/M^3
n-Propylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Styrene	**282**	**298**	**265**	**97**	**253**	20	ug/M^3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Tetrachloroethylene	ND	ND	ND	ND	ND	20	ug/M^3
Toluene	**63**	**75**	**69**	ND	**221**	20	ug/M^3
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Trichloroethylene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-A-20 DUP	GP-9-A-20 1P	GP-9-A-20 7P	GP-9-C-5	GP-9-C-10	**Practical Quantitation Limits**	**Units**
Analytes:							
Trichlorofluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Vinyl chloride	ND	ND	ND	ND	ND	20	ug/M^3
Xylenes	**62**	**59**	**62**	ND	**60**	20	ug/M^3
MTBE	ND	ND	ND	ND	ND	20	ug/M^3
Ethyl-tert-butylether	ND	ND	ND	ND	ND	20	ug/M^3
Di-isopropylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-amylmethylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylalcohol	ND	ND	ND	ND	ND	100	ug/M^3
TIC							
n-Propanol	ND	ND	ND	ND	ND	20	ug/M^3
Acetone	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Butadiene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon Disulfide	ND	ND	ND	ND	ND	20	ug/M^3
Heptane	ND	ND	ND	ND	ND	20	ug/M^3
2-Butanone (MEK)	**416**	ND	ND	ND	ND	20	ug/M^3
Dilution Factor	1	1	1	1	1		
Surrogate Recovery :						**QC Limits**	
Dibromofluoromethane	95%	99%	108%	99%	103%	60 - 140	
Toluene-d_8	108%	103%	103%	98%	102%	60 - 140	
4-Bromofluorobenzene	99%	98%	99%	103%	103%	60 - 140	

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-B-5	GP-9-B-10	GP-9-B-17	GP-9-D-5	GP-9-D-10	**Practical Quantitation Limits**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromodichloromethane	ND	ND	ND	ND	ND	20	ug/M^3
Bromoform	ND	ND	ND	ND	ND	20	ug/M^3
n-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
sec-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon tetrachloride	ND	ND	ND	ND	ND	20	ug/M^3
Chlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Chloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Chloroform	ND	ND	ND	ND	ND	20	ug/M^3
Chloromethane	ND	ND	ND	ND	ND	20	ug/M^3
2-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
4-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
Dibromochloromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	20	ug/M^3
Dibromomethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Dichlorodifluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-B-5	GP-9-B-10	GP-9-B-17	GP-9-D-5	GP-9-D-10	**Practical Quantitation Limits**	**Units**
Analytes:							
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
2,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
Ethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Freon 113	ND	ND	ND	ND	ND	20	ug/M^3
Hexachlorobutadiene	ND	ND	ND	ND	ND	20	ug/M^3
Isopropylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
4-Isopropyltoluene	ND	ND	ND	ND	ND	20	ug/M^3
Methylene chloride	ND	ND	ND	ND	ND	20	ug/M^3
Naphthalene	ND	ND	ND	ND	ND	20	ug/M^3
n-Propylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Styrene	**109**	**256**	ND	**108**	**254**	20	ug/M^3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Tetrachloroethylene	ND	ND	ND	ND	ND	20	ug/M^3
Toluene	ND	**102**	**55**	ND	**135**	20	ug/M^3
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Trichloroethylene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-B-5	GP-9-B-10	GP-9-B-17	GP-9-D-5	GP-9-D-10	**Practical Quantitation Limits**	**Units**
Analytes:							
Trichlorofluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Vinyl chloride	ND	ND	ND	ND	ND	20	ug/M^3
Xylenes	ND	ND	ND	ND	**75**	20	ug/M^3
MTBE	ND	ND	ND	ND	ND	20	ug/M^3
Ethyl-tert-butylether	ND	ND	ND	ND	ND	20	ug/M^3
Di-isopropylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-amylmethylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylalcohol	ND	ND	ND	ND	ND	100	ug/M^3
TIC							
n-Propanol	ND	ND	ND	ND	ND	20	ug/M^3
Acetone	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Butadiene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon Disulfide	ND	ND	ND	ND	ND	20	ug/M^3
Heptane	ND	ND	ND	ND	ND	20	ug/M^3
2-Butanone (MEK)	ND	**368**	ND	ND	**421**	20	ug/M^3
Dilution Factor	1	1	1	1	1		
Surrogate Recovery :						**QC Limits**	
Dibromofluoromethane	96%	86%	87%	102%	105%	60 - 140	
Toluene-d_8	93%	101%	100%	96%	106%	60 - 140	
4-Bromofluorobenzene	97%	102%	103%	109%	100%	60 - 140	

ND = Not Detected

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LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-D-15	GP-9-E-5	GP-9-E-10	GP-9-E-15	GP-9-E-15 DUP	**Practical Quantitation Limits**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromodichloromethane	ND	ND	ND	ND	ND	20	ug/M^3
Bromoform	ND	ND	ND	ND	ND	20	ug/M^3
n-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
sec-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon tetrachloride	ND	ND	ND	ND	ND	20	ug/M^3
Chlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Chloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Chloroform	ND	ND	ND	ND	ND	20	ug/M^3
Chloromethane	ND	ND	ND	ND	ND	20	ug/M^3
2-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
4-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
Dibromochloromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	20	ug/M^3
Dibromomethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Dichlorodifluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-D-15	GP-9-E-5	GP-9-E-10	GP-9-E-15	GP-9-E-15 DUP	**Practical Quantitation Limits**	**Units**
Analytes:							
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
2,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
Ethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Freon 113	ND	ND	ND	ND	ND	20	ug/M^3
Hexachlorobutadiene	ND	ND	ND	ND	ND	20	ug/M^3
Isopropylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
4-Isopropyltoluene	ND	ND	ND	ND	ND	20	ug/M^3
Methylene chloride	ND	ND	ND	ND	ND	20	ug/M^3
Naphthalene	ND	ND	ND	ND	ND	20	ug/M^3
n-Propylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Styrene	**126**	ND	**233**	**231**	ND	20	ug/M^3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Tetrachloroethylene	ND	ND	ND	ND	ND	20	ug/M^3
Toluene	ND	ND	**50**	ND	ND	20	ug/M^3
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Trichloroethylene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-D-15	GP-9-E-5	GP-9-E-10	GP-9-E-15	GP-9-E-15 DUP	**Practical Quantitation Limits**	**Units**
Analytes:							
Trichlorofluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Vinyl chloride	ND	ND	ND	ND	ND	20	ug/M^3
Xylenes	ND	ND	**48**	**40**	ND	20	ug/M^3
MTBE	ND	ND	ND	ND	ND	20	ug/M^3
Ethyl-tert-butylether	ND	ND	ND	ND	ND	20	ug/M^3
Di-isopropylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-amylmethylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylalcohol	ND	ND	ND	ND	ND	100	ug/M^3
TIC							
n-Propanol	ND	ND	ND	ND	ND	20	ug/M^3
Acetone	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Butadiene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon Disulfide	ND	ND	ND	ND	ND	20	ug/M^3
Heptane	ND	ND	ND	ND	ND	20	ug/M^3
2-Butanone (MEK)	ND	ND	**363**	**242**	ND	20	ug/M^3
Dilution Factor	1	1	1	1	1		
Surrogate Recovery :						**QC Limits**	
Dibromofluoromethane	98%	98%	104%	99%	99%	60 - 140	
Toluene-d_8	92%	93%	102%	105%	92%	60 - 140	
4-Bromofluorobenzene	99%	111%	104%	103%	110%	60 - 140	

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-F-5	GP-9-F-10	GP-9-F-18	**Practical Quantitation Limits**	**Units**
Analytes:					
Benzene	ND	ND	ND	20	ug/M^3
Bromobenzene	ND	ND	ND	20	ug/M^3
Bromodichloromethane	ND	ND	ND	20	ug/M^3
Bromoform	ND	ND	ND	20	ug/M^3
n-Butylbenzene	ND	ND	ND	20	ug/M^3
sec-Butylbenzene	ND	ND	ND	20	ug/M^3
tert-Butylbenzene	ND	ND	ND	20	ug/M^3
Carbon tetrachloride	ND	ND	ND	20	ug/M^3
Chlorobenzene	ND	ND	ND	20	ug/M^3
Chloroethane	ND	ND	ND	20	ug/M^3
Chloroform	ND	ND	ND	20	ug/M^3
Chloromethane	ND	ND	ND	20	ug/M^3
2-Chlorotoluene	ND	ND	ND	20	ug/M^3
4-Chlorotoluene	ND	ND	ND	20	ug/M^3
Dibromochloromethane	ND	ND	ND	20	ug/M^3
1,2-Dibromo-3-chloropropane	ND	ND	ND	20	ug/M^3
1,2-Dibromoethane (EDB)	ND	ND	ND	20	ug/M^3
Dibromomethane	ND	ND	ND	20	ug/M^3
1,2- Dichlorobenzene	ND	ND	ND	20	ug/M^3
1,3-Dichlorobenzene	ND	ND	ND	20	ug/M^3
1,4-Dichlorobenzene	ND	ND	ND	20	ug/M^3
Dichlorodifluoromethane	ND	ND	ND	20	ug/M^3
1,1-Dichloroethane	ND	ND	ND	20	ug/M^3
1,2-Dichloroethane	ND	ND	ND	20	ug/M^3
1,1-Dichloroethene	ND	ND	ND	20	ug/M^3

ND = Not Detected

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LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-F-5	GP-9-F-10	GP-9-F-18	**Practical Quantitation Limits**	**Units**
Analytes:					
cis-1,2-Dichloroethene	ND	ND	ND	20	ug/M^3
trans-1,2-Dichloroethene	ND	ND	ND	20	ug/M^3
1,2-Dichloropropane	ND	ND	ND	20	ug/M^3
1,3-Dichloropropane	ND	ND	ND	20	ug/M^3
2,2-Dichloropropane	ND	ND	ND	20	ug/M^3
1,1-Dichloropropene	ND	ND	ND	20	ug/M^3
cis-1,3-Dichloropropene	ND	ND	ND	20	ug/M^3
trans-1,3-Dichloropropene	ND	ND	ND	20	ug/M^3
Ethylbenzene	ND	ND	ND	20	ug/M^3
Freon 113	ND	ND	ND	20	ug/M^3
Hexachlorobutadiene	ND	ND	ND	20	ug/M^3
Isopropylbenzene	ND	ND	ND	20	ug/M^3
4-Isopropyltoluene	ND	ND	ND	20	ug/M^3
Methylene chloride	ND	ND	ND	20	ug/M^3
Naphthalene	ND	ND	ND	20	ug/M^3
n-Propylbenzene	ND	ND	ND	20	ug/M^3
Styrene	**254**	**258**	**99**	20	ug/M^3
1,1,1,2-Tetrachloroethane	ND	ND	ND	20	ug/M^3
1,1,2,2-Tetrachloroethane	ND	ND	ND	20	ug/M^3
Tetrachloroethylene	ND	ND	ND	20	ug/M^3
Toluene	**37**	**194**	ND	20	ug/M^3
1,2,3-Trichlorobenzene	ND	ND	ND	20	ug/M^3
1,2,4-Trichlorobenzene	ND	ND	ND	20	ug/M^3
1,1,1-Trichloroethane	ND	ND	ND	20	ug/M^3
1,1,2-Trichloroethane	ND	ND	ND	20	ug/M^3
Trichloroethylene	ND	ND	ND	20	ug/M^3

ND = Not Detected

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(714) 449-9937 • FAX (714) 4499685

JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-9-F-5	GP-9-F-10	GP-9-F-18	**Practical Quantitation Limits**	**Units**
Analytes:					
Trichlorofluoromethane	ND	ND	ND	20	ug/M^3
1,2,3-Trichloropropane	ND	ND	ND	20	ug/M^3
1,2,4-Trimethylbenzene	ND	ND	ND	20	ug/M^3
1,3,5-Trimethylbenzene	ND	ND	ND	20	ug/M^3
Vinyl chloride	ND	ND	ND	20	ug/M^3
Xylenes	**287**	**112**	**273**	20	ug/M^3
MTBE	ND	ND	ND	20	ug/M^3
Ethyl-tert-butylether	ND	ND	ND	20	ug/M^3
Di-isopropylether	ND	ND	ND	20	ug/M^3
tert-amylmethylether	ND	ND	ND	20	ug/M^3
tert-Butylalcohol	ND	ND	ND	100	ug/M^3
TIC					
n-Propanol	ND	ND	ND	20	ug/M^3
Acetone	ND	ND	ND	20	ug/M^3
1,3-Butadiene	ND	ND	ND	20	ug/M^3
Carbon Disulfide	ND	ND	ND	20	ug/M^3
Heptane	ND	ND	ND	20	ug/M^3
2-Butanone (MEK)	ND	**486**	ND	20	ug/M^3
Dilution Factor	1	1	1		
Surrogate Recovery :				**QC Limits**	
Dibromofluoromethane	134%	98%	92%	60 - 140	
Toluene-d_8	106%	103%	93%	60 - 140	
4-Bromofluorobenzene	111%	110%	104%	60 - 140	

ND = Not Detected

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QUALITY CONTROL INFORMATION

Client:	Converse Consultants, Inc.	**Report Date:**	02/08/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4963
Attn:	William Ragsdale	**Date Sampled:**	02/04/10
		Date Received:	02/04/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/04/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

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EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample Spiked: AMBIENT AIR

Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)
1,1-Dichloroethylene	73%	70%	4.4%	70-130
Benzene	100%	106%	6.1%	70-130
Trichloroethylene	99%	97%	3.0%	70-130
Toluene	103%	98%	5.7%	70-130
Chlorobezene	101%	104%	2.7%	70-130

Sample Spiked: AMBIENT AIR

Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)
1,1-Dichloroethylene	92%	90%	1.2%	70-130
Benzene	108%	109%	0.7%	70-130
Trichloroethylene	94%	93%	1.2%	70-130
Toluene	99%	91%	3.3%	70-130
Chlorobenzene	94%	91%	2.8%	70-130

Method Blank = Not Detected

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

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Chain-of-Custody Record

Client: Converse Consultants
Date: 02/04/10
Project Name:
Client Project #:
Project Address: Live Oak Ave & Arrow Hwy, Irwindale, CA
Project Contact: William Ragsdale

Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24-48 Hours
- ☐ Rush 72-96 Hours
- ☐ Normal
- ☒ Mobile Lab

SOIL GAS
Purge Vol: ☐ 1P ☒ 3P ☐ 7P
Tracer: n-propanol
Purge Rate: 200 cc/min

JEL Project #: B-4963
Page: 1 of 3

Lab Use Only
Sample Condition as Received:
Chilled ☐ yes ☒ no
Sealed ☒ yes ☐ no

Analysis Requested: 8260B VOCs + Oxygenates

Sample ID	Purge Volume	Discussion	Date	Time	Laboratory Sample Number	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Soil Gas (SG)	8260B VOCs + Oxygenates	Number of Containers	Remarks/Special Instructions
GP-9-A-10 1P	100cc	1 Purge Vol	2/4/10	09:05	B-4963-1	SG	X	1	Glass Gastight Syringe
GP-9-A-10 3P	300cc	3 Purge Vol.	2/4/10	09:07	B-4963-2	SG	X	1	" "
GP-9-A-10 7P	700cc	7 Purge Vol.	2/4/10	09:40	B-4963-3	SG	X	1	" "
GP-9-A-5	225cc	3 Purge Vol	2/4/10	09:42	B-4963-4	SG	X	1	" "
GP-9-A-20 3P	450cc	3 Purge Vol	2/4/10	10:09	B-4963-5	SG	X	1	" "
GP-9-A-20 DUP	450cc	3 Purge Vol	2/4/10	10:11	B-4963-6	SG	X	1	" "
GP-9-A-20 1P	150cc	1 Purge Vol	2/4/10	10:50	B-4963-7	SG	X	1	" "
GP-9-A-20 7P	1050cc	7 Purge Vol	2/4/10	10:52	B-4963-8	SG	X	1	" "
GP-9-C-5	225cc	3 Purge Vol	2/4/10	11:45	B-4963-9	SG	X	1	" "
GP-9-C-10	300cc	3 Purge Vol	2/4/10	11:47	B-4963-10	SG	X	1	" "

❶ Relinquished by (signature)	Date 2/4/10	❷ Received by (signature)	Date 02/04/10	Total Number of Containers
Company	Time	Company JEL	Time 15:30	
❸ Relinquished by (signature)	Date	❹ Received by Laboratory (signature)	Date	
Company	Time	Company	Time	

The delivery of samples and the signature on this Chain of Custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

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Chain-of-Custody Record

Client: Converse Consultants
Date: 02/04/10
Project Name:
Client Project #:
Project Address: Live Oak Ave & Arrow Hwy, Irwindale, CA
Project Contact: William Ragsdale

Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24-48 Hours
- ☐ Rush 72-96 Hours
- ☐ Normal
- ☒ Mobile Lab

SOIL GAS
Purge Vol: ☐ 1P ☒ 3P ☐ 7P
Tracer: n propanol
Purge Rate: 200 cc/min

JEL Project #: B-4693
Page 2 of 3
Lab Use Only
Sample Condition as Received:
Chilled ☐ yes ☒ no
Sealed ☒ yes ☐ no

Sample ID	Purge Volume	Discussion	Date	Time	Laboratory Sample Number	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Soil Gas (SG)	Analysis Requested: 8260B VOCs + Oxys	Number of Containers	Remarks/Special Instructions
GP-9-B-5	225cc	3 Purge Vol.	2/4/10	12:05	B-4693-11	SG	X	1	Glass Gastight Syr.
GP-9-B-10	300cc	" "	2/4/10	12:07	B-4693-12	SG	X	1	" "
GP-9-B-17	405cc	" "	2/4/10	12:27	B-4693-13	SG	X	1	" "
GP-9-D-5	225cc	" "	2/4/10	13:45	B-4693-14	SG	X	1	" "
GP-9-D-10	300cc	" "	2/4/10	13:47	B-4693-15	SG	X	1	" "
GP-9-D-15	375cc	" "	2/4/10	13:59	B-4693-16	SG	X	1	" "
GP-9-E-5	225cc	" "	2/4/10	14:30	B-4693-17	SG	X	1	" "
GP-9-E-10	300cc	" "	2/4/10	14:32	B-4693-18	SG	X	1	" "
GP-9-E-15	375cc	" "	2/4/10	15:00	B-4693-19	SG	X	1	" "
GP-9-E-15 DUP	375cc	" "	2/4/10	15:02	B-4693-20	SG	X	1	" "

❶ Relinquished by (signature)	Date 2/4/10	❷ Received by (signature)	Date 02/04/10	Total Number of Containers
Company	Time	Company JEL	Time 15:30	
❸ Relinquished by (signature)	Date	❹ Received by Laboratory (signature)	Date	
Company	Time	Company	Time	

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Chain-of-Custody Record

Client: Converse Consultants
Date: 02/04/10
Project Name:
Client Project #:
Project Address: Live Oak Ave & Arrow Hwy, Irwindale, CA
Project Contact: William Raysdale

Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24-48 Hours
- ☐ Rush 72-96 Hours
- ☐ Normal
- ☒ Mobile Lab

SOIL GAS
Purge Vol: ☐ 1P ☒ 3P ☐ 7P
Tracer: n Propanol
Purge Rate: 200 cc/min

JEL Project #: B-4693
Page 3 of 3

Lab Use Only
Sample Condition as Received:
Chilled ☐ yes ☒ no
Sealed ☒ yes ☐ no

Sample ID	Purge Volume	Discussion	Date	Time	Laboratory Sample Number	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Soil Gas (SG)	Analysis Requested: 8260B VOCs 10X	Number of Containers	Remarks/Special Instructions
GP-9-F-5	225cc	3 Purge Vol	2/4/10	15:22	B-4693-21	SG	X	1	Glass Gastight Syr
GP-9-F-10	300cc	"	2/4/10	15:24	B-4693-22	SG	X	1	" "
GP-9-F-18	420cc	"	2/4/10	15:26	B-4693-23	SG	X	1	" "

❶ Relinquished by (signature)	Date 2/4/10	❷ Received by (signature)	Date 02/04/10	Total Number of Containers
Company	Time	Company JEL	Time 15:30	
❸ Relinquished by (signature)	Date	❹ Received by Laboratory (signature)	Date	
Company	Time	Company	Time	

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JONES ENVIRONMENTAL

LABORATORY REPORT

Client:	Converse Consultants, Inc.	**Report Date:**	02/15/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/15/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

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ANALYSES REQUESTED

1. EPA 8260B- Volatile Organics by GC/MS + Oxygenates

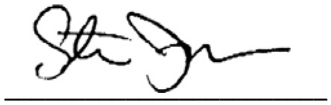
Sampling – Soil Gas samples are collected in glass gas-tight syringes equipped with Teflon plungers. Tubing placed in the ground for soil gas sampling is purged three different times as recommended by DTSC/RWQCB regulations. This purge test determines how many purges of the soil gas tubing are needed throughout the project. One, three and seven purge volumes were analyzed to make this determination.

A tracer gas, n-Propanol, was placed at the tubing-surface interface before sampling. This compound is analyzed during the 8260B analytical run to determine if there are surface leaks into the subsurface due to improper installation of the probe. No n-Propanol was found in any of the samples reported herein.

The sampling rate was approximately 200 cc/min except when noted differently on the chain of custody record using a gas tight syringe. 3 purge volumes were used since this purging level gave the highest results for the compound(s) of greatest interest.

Analytical – Soil Gas samples were analyzed using EPA Method 8260 that includes extra compounds required by DTSC/RWQCB (such as Freon 113). Instrument Continuing Calibration Verification , QC Reference Standards, Instrument Blanks and Ambient Air Blanks are analyzed every 12 hours as prescribed by the method. In addition, Matrix Spike (MS) and Matrix Spike Duplicates (MSD) are analyzed with each batch of Soil Gas samples. A duplicate sample is analyzed each day of the sampling activity.

All samples were analyzed within 30 minutes of sampling.

Approval: 

Steve Jones, Ph.D.
Laboratory Manager

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/15/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/15/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-8-C-5	GP-8-C-10	GP-8-C-20	GP-8-C-20 DUP	GP-8-B-5	**Practical Quantitation Limits**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromodichloromethane	ND	ND	ND	ND	ND	20	ug/M^3
Bromoform	ND	ND	ND	ND	ND	20	ug/M^3
n-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
sec-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon tetrachloride	ND	ND	ND	ND	ND	20	ug/M^3
Chlorobenzene	**618**	ND	ND	ND	ND	20	ug/M^3
Chloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Chloroform	ND	ND	ND	ND	ND	20	ug/M^3
Chloromethane	ND	ND	ND	ND	ND	20	ug/M^3
2-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
4-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
Dibromochloromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	20	ug/M^3
Dibromomethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Dichlorodifluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/15/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/15/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-8-C-5	GP-8-C-10	GP-8-C-20	GP-8-C-20 DUP	GP-8-B-5	**Practical Quantitation Limits**	**Units**
Analytes:							
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
2,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
Ethylbenzene	**367**	ND	ND	ND	**427**	20	ug/M^3
Freon 113	ND	ND	ND	ND	ND	20	ug/M^3
Hexachlorobutadiene	ND	ND	ND	ND	ND	20	ug/M^3
Isopropylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
4-Isopropyltoluene	ND	ND	ND	ND	ND	20	ug/M^3
Methylene chloride	ND	ND	ND	ND	ND	20	ug/M^3
Naphthalene	ND	ND	ND	ND	ND	20	ug/M^3
n-Propylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Styrene	**755**	**66**	**56**	**55**	**739**	20	ug/M^3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Tetrachloroethylene	ND	ND	ND	ND	ND	20	ug/M^3
Toluene	**550**	**45**	ND	ND	**538**	20	ug/M^3
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Trichloroethylene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/15/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-8-C-5	GP-8-C-10	GP-8-C-20	GP-8-C-20 DUP	GP-8-B-5	**Practical Quantitation Limits**	**Units**
Analytes:							
Trichlorofluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Vinyl chloride	ND	ND	ND	ND	ND	20	ug/M^3
Xylenes	**714**	ND	ND	ND	**689**	20	ug/M^3
MTBE	ND	ND	ND	ND	ND	20	ug/M^3
Ethyl-tert-butylether	ND	ND	ND	ND	ND	20	ug/M^3
Di-isopropylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-amylmethylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylalcohol	ND	ND	ND	ND	ND	100	ug/M^3
TIC							
n-Propanol	ND	ND	ND	ND	ND	20	ug/M^3
Acetone	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Butadiene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon Disulfide	ND	ND	ND	ND	ND	20	ug/M^3
Heptane	ND	ND	ND	ND	ND	20	ug/M^3
2-Butanone (MEK)	ND	ND	ND	ND	ND	20	ug/M^3
Dilution Factor	1	1	1	1	1		
Surrogate Recovery :						**QC Limits**	
Dibromofluoromethane	99%	102%	108%	112%	112%	60 - 140	
Toluene-d_8	100%	98%	103%	102%	94%	60 - 140	
4-Bromofluorobenzene	101%	99%	99%	97%	104%	60 - 140	

ND = Not Detected

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		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/15/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-8-B-10	GP-8-B-20	GP-8-A-5	GP-8-A-10	GP-8-A-17	**Practical Quantitation Limits**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Bromodichloromethane	ND	ND	ND	ND	ND	20	ug/M^3
Bromoform	ND	ND	ND	ND	ND	20	ug/M^3
n-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
sec-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon tetrachloride	ND	ND	ND	ND	ND	20	ug/M^3
Chlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Chloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Chloroform	ND	ND	ND	ND	ND	20	ug/M^3
Chloromethane	ND	ND	ND	ND	ND	20	ug/M^3
2-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
4-Chlorotoluene	ND	ND	ND	ND	ND	20	ug/M^3
Dibromochloromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	20	ug/M^3
Dibromomethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
Dichlorodifluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/15/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/15/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-8-B-10	GP-8-B-20	GP-8-A-5	GP-8-A-10	GP-8-A-17	**Practical Quantitation Limits**	**Units**
Analytes:							
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	20	ug/M^3
1,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,3-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
2,2-Dichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,1-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	20	ug/M^3
Ethylbenzene	ND	ND	**422**	ND	ND	20	ug/M^3
Freon 113	ND	ND	ND	ND	ND	20	ug/M^3
Hexachlorobutadiene	ND	ND	ND	ND	ND	20	ug/M^3
Isopropylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
4-Isopropyltoluene	ND	ND	ND	ND	ND	20	ug/M^3
Methylene chloride	ND	ND	ND	ND	ND	20	ug/M^3
Naphthalene	ND	ND	ND	ND	ND	20	ug/M^3
n-Propylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Styrene	**54**	**97**	ND	**55**	**72**	20	ug/M^3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Tetrachloroethylene	ND	ND	ND	ND	ND	20	ug/M^3
Toluene	ND	ND	**534**	**36**	ND	20	ug/M^3
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	20	ug/M^3
Trichloroethylene	ND	ND	ND	ND	ND	20	ug/M^3

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/15/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/15/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample ID:	GP-8-B-10	GP-8-B-20	GP-8-A-5	GP-8-A-10	GP-8-A-17	**Practical Quantitation Limits**	**Units**
Analytes:							
Trichlorofluoromethane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	20	ug/M^3
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	20	ug/M^3
Vinyl chloride	ND	ND	ND	ND	ND	20	ug/M^3
Xylenes	ND	ND	**681**	ND	ND	20	ug/M^3
MTBE	ND	ND	ND	ND	ND	20	ug/M^3
Ethyl-tert-butylether	ND	ND	ND	ND	ND	20	ug/M^3
Di-isopropylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-amylmethylether	ND	ND	ND	ND	ND	20	ug/M^3
tert-Butylalcohol	ND	ND	ND	ND	ND	100	ug/M^3
TIC							
n-Propanol	ND	ND	ND	ND	ND	20	ug/M^3
Acetone	ND	**473**	ND	ND	ND	20	ug/M^3
1,3-Butadiene	ND	ND	ND	ND	ND	20	ug/M^3
Carbon Disulfide	ND	**4530**	ND	ND	ND	20	ug/M^3
Heptane	ND	ND	ND	ND	ND	20	ug/M^3
2-Butanone (MEK)	ND	ND	ND	ND	ND	20	ug/M^3
Dilution Factor	1	1	1	1	1		
Surrogate Recovery :						**QC Limits**	
Dibromofluoromethane	105%	106%	116%	112%	115%	60 - 140	
Toluene-d_8	99%	100%	97%	102%	101%	60 - 140	
4-Bromofluorobenzene	105%	104%	98%	97%	100%	60 - 140	

ND = Not Detected

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QUALITY CONTROL INFORMATION

Client:	Converse Consultants, Inc.	**Report Date:**	02/15/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/15/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

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EPA 8260B- Volatile Organics by GC/MS + Oxygenates

Sample Spiked: AMBIENT AIR

Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)
1,1-Dichloroethylene	78%	71%	9.4%	70-130
Benzene	105%	97%	8.4%	70-130
Trichloroethylene	72%	64%	11%	70-130
Toluene	119%	120%	0.5%	70-130
Chlorobezene	115%	114%	0.6%	70-130

Sample Spiked: AMBIENT AIR

Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)
1,1-Dichloroethylene	97%	98%	0.7%	70-130
Benzene	109%	106%	3.0%	70-130
Trichloroethylene	102%	103%	1.1%	70-130
Toluene	102%	98%	4.4%	70-130
Chlorobenzene	105%	105%	0.5%	70-130

Method Blank = Not Detected

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

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Chain-of-Custody Record

Client: Converse Consultants
Date: 02/15/2010
Project Name:
Client Project #:
Project Address: Live Oak & Arrow Hwy. Irwindale, CA
Project Contact: William Ragsdale

Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24-48 Hours
- ☐ Rush 72-96 Hours
- ☐ Normal
- ☒ Mobile Lab

SOIL GAS
Purge Vol: ☐ 1P ☒ 3P ☐ 7P
Tracer: n propanol
Purge Rate: 200 cc/min

JEL Project #: B-4964
Page: 1 of 2

Lab Use Only
Sample Condition as Received:
Chilled ☐ yes ☒ no
Sealed ☒ yes ☐ no

Sample ID	Purge Volume	Discussion	Date	Time	Laboratory Sample Number	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Soil Gas (SG)	Analysis Requested: 8260B (GL) 15CA	Number of Containers	Remarks/Special Instructions
GP-8-C-5	225cc	3 purge Vol	2/15/10	09:00	B-4964-1	SG	X	1	Glass Gastight Syringe
GP-8-C-10	300cc	" "	2/15/10	09:03	B-4964-2	SG	X	1	" "
GP-8-C-20	450cc	" "	2/15/10	09:22	B-4964-3	SG	X	1	" "
GP8-C-20 DUP	450cc	" "	2/15/10	09:25	B-4964-4	SG	X	1	" "
GP-8-B-5	225cc	" "	2/15/10	10:30	B-4964-5	SG	X	1	" "
GP-8-B-10	300cc	" "	2/15/10	10:32	B-4964-6	SG	X	1	" "
GP-8-B-20	450cc	" "	2/15/10	10:45	B-4964-7	SG	X	1	" "
GP-8-A-5	225cc	" "	2/15/10	12:00	B-4964-8	SG	X	1	" "
GP-8-A-10	300cc	" "	2/15/10	12:02	B-4964-9	SG	X	1	" "
GP-8-A-17	450cc	" "	2/15/10	12:15	B-4964-10	SG	X	1	" "

❶ Relinquished by (signature)	Date 2/15/10	❷ Received by (signature)	Date 2/15/10	Total Number of Containers
Company	Time	Company JEL	Time	
❸ Relinquished by (signature)	Date	❹ Received by Laboratory (signature)	Date	
Company	Time	Company	Time	

The delivery of samples and the signature on this Chain of Custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

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JONES ENVIRONMENTAL

LABORATORY REPORT

Client:	Converse Consultants, Inc.	**Report Date:**	02/18/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964B
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/17/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

ANALYSES REQUESTED

1. EPA TO-15 - Volatile Organics by GC/MS in Air/SUMMA Canister

Sampling – Soil Gas samples are collected in metal 1 Liter SUMMA Canisters. Tubing placed in the ground for soil gas sampling is purged three different times as recommended by DTSC/RWQCB regulations. This purge test determines how many purges of the soil gas tubing are needed throughout the project. One, three and seven purge volumes were analyzed to make this determination previously.

A tracer gas, n-Propanol, is placed at the tubing-surface interface before sampling. This compound is analyzed during the TO-15 analytical run to determine if there are surface leaks into the subsurface due to improper installation of the probe. No n-Propanol was found in any of the samples reported herein.

The sampling rate was approximately 200 cc/min except when noted differently on the chain of custody record. 3 purge volumes were used since this purging level gave the highest results for the compound(s) of greatest interest.

Analytical – Soil Gas samples were analyzed using EPA Method TO-15 that includes extra compounds required by DTSC/RWQCB (such as Freon 113). Instrument Continuing Calibration Verification , QC Reference Standards, Instrument Blanks and Ambient Air Blanks are analyzed every 12 hours as prescribed by the method. In addition, Matrix Spike (MS) and Matrix Spike Duplicates (MSD) are analyzed with each batch of Soil Gas samples. A duplicate sample is analyzed each day of the sampling activity.

Approval: _____

Steve Jones, Ph.D.
Laboratory Manager

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/18/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964B
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		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/17/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA TO-15 - Volatile Organics by GC/MS in Air/ SUMMA Canister

Sample ID:	GP-9-A-20	GP-9-B-10	GP-9-C-10	GP-9-D-10	GP-9-E-10	**Practical Quantitation Limits**	**Units**
Analytes:							
Acetone	ND	ND	ND	ND	ND	20(48)	ppbV(µg/m^3)
Benzene	ND	ND	ND	ND	ND	5.0(16)	ppbV(µg/m^3)
Benzyl Chloride	ND	ND	ND	ND	ND	5.0(26)	ppbV(µg/m^3)
Bromodichloromethane	ND	ND	ND	ND	ND	5.0(34)	ppbV(µg/m^3)
Bromoform	ND	ND	ND	ND	ND	5.0(52)	ppbV(µg/m^3)
Bromomethane	ND	ND	ND	ND	ND	5.0(19)	ppbV(µg/m^3)
1,3-Butadiene	ND	ND	ND	ND	ND	5.0(11)	ppbV(µg/m^3)
2-Butanone (MEK)	ND	ND	ND	ND	ND	5.0(15)	ppbV(µg/m^3)
Carbon disulfide	ND	ND	ND	ND	ND	5.0(16)	ppbV(µg/m^3)
Carbon tetrachloride	ND	ND	ND	ND	ND	5.0(31)	ppbV(µg/m^3)
Chlorobenzene	ND	ND	ND	ND	ND	5.0(23)	ppbV(µg/m^3)
Chloroethane	ND	ND	ND	ND	ND	5.0(13)	ppbV(µg/m^3)
Chloroform	ND	ND	ND	ND	ND	5.0(24)	ppbV(µg/m^3)
Chloromethane	ND	ND	ND	ND	ND	20(41)	ppbV(µg/m^3)
3-Chloropropene	ND	ND	ND	ND	ND	20(63)	ppbV(µg/m^3)
Cyclohexane	ND	ND	ND	ND	ND	5.0(17)	ppbV(µg/m^3)
Dibromochloromethane	ND	ND	ND	ND	ND	5.0(42)	ppbV(µg/m^3)
1,2-Dibromoethane	ND	ND	ND	ND	ND	5.0(38)	ppbV(µg/m^3)
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	5.0(30)	ppbV(µg/m^3)
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	5.0(30)	ppbV(µg/m^3)
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	5.0(30)	ppbV(µg/m^3)
1,1-Dichloroethane	ND	ND	ND	ND	ND	5.0(20)	ppbV(µg/m^3)
1,2-Dichloroethane	ND	ND	ND	ND	ND	5.0(20)	ppbV(µg/m^3)
1,1-Dichloroethene	ND	ND	ND	ND	ND	5.0(20)	ppbV(µg/m^3)
cis-1,2-dichloroethene	ND	ND	ND	ND	ND	5.0(20)	ppbV(µg/m^3)

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/18/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964B
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Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/17/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA TO-15 - Volatile Organics by GC/MS in Air/ SUMMA Canister

Sample ID:	GP-9-A-20	GP-9-B-10	GP-9-C-10	GP-9-D-10	GP-9-E-10	**Practical Quantitation Limits**	**Units**
Analytes:							
trans-1,2-dichloroethene	ND	ND	ND	ND	ND	5.0(20)	ppbV(µg/m^3)
1,2-Dichloropropane	ND	ND	ND	ND	ND	5.0(23)	ppbV(µg/m^3)
Cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	5.0(23)	ppbV(µg/m^3)
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	5.0(23)	ppbV(µg/m^3)
1,4-Dioxane	ND	ND	ND	ND	ND	20)72)	ppbV(µg/m^3)
Ethanol	ND	ND	ND	ND	ND	20(38)	ppbV(µg/m^3)
Ethyl benzene	ND	ND	ND	ND	ND	5.0(22)	ppbV(µg/m^3)
4-Ethyltoluene	ND	ND	ND	ND	ND	5.0(24)	ppbV(µg/m^3)
Freon 11	ND	ND	ND	ND	ND	5.0(28	ppbV(µg/m^3)
Freon 12	ND	ND	ND	ND	ND	5.0(25)	ppbV(µg/m^3)
Freon 113	ND	ND	ND	ND	ND	5.0(38)	ppbV(µg/m^3)
Freon 114	ND	ND	ND	ND	ND	5.0(35)	ppbV(µg/m^3)
Heptane	ND	ND	ND	ND	ND	5.0(20)	ppbV(µg/m^3)
Hexachloro-1,3-butadiene	ND	ND	ND	ND	ND	20(210)	ppbV(µg/m^3)
Hexane	ND	ND	**61(253)**	ND	ND	5.0(18)	ppbV(µg/m^3)
2-Hexanone (MBK)	ND	ND	ND	ND	ND	20(82)	ppbV(µg/m^3)
Isopropylbenzene (Cumene)	ND	ND	ND	ND	ND	5.0(24)	ppbV(µg/m^3)
4-Methyl-2-Pentanone (MIBK)	ND	ND	ND	ND	ND	5.0(20)	ppbV(µg/m^3)
Methylene chloride	ND	ND	ND	ND	ND	5.0(17)	ppbV(µg/m^3)
MTBE	ND	ND	ND	ND	ND	5.0(18)	ppbV(µg/m^3)
2-Propanol (Isopropyl Alcohol)	ND	ND	ND	ND	ND	20(49)	ppbV(µg/m^3)
Propylbenzene	ND	ND	ND	ND	ND	5.0(24)	ppbV(µg/m^3)
Styrene	ND	ND	ND	ND	ND	5.0(21)	ppbV(µg/m^3)
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	5.0(34)	ppbV(µg/m^3)

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/18/10
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Attn:	William Ragsdale	**Date Sampled:**	02/15/10
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Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/17/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA TO-15 - Volatile Organics by GC/MS in Air/ SUMMA Canister

Sample ID:	GP-9-A-20	GP-9-B-10	GP-9-C-10	GP-9-D-10	GP-9-E-10	**Practical Quantitation Limits**	**Units**
Analytes:							
Tetrachloroethene	ND	ND	ND	ND	ND	5.0(34)	ppbV(µg/m^3)
Tetrahydrofuran	ND	ND	ND	ND	ND	5.0(15)	ppbV(µg/m^3)
Toluene	ND	ND	**21(81)**	ND	ND	5.0(19)	ppbV(µg/m^3)
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	20(150)	ppbV(µg/m^3)
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	5.0(27)	ppbV(µg/m^3)
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	5.0(27)	ppbV(µg/m^3)
Trichloroethene	ND	ND	ND	ND	ND	5.0(27)	ppbV(µg/m^3)
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	5.0(24)	ppbV(µg/m^3)
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	5.0(24)	ppbV(µg/m^3)
2,2,4-Trimethylpentane	ND	ND	ND	ND	ND	5.0(23)	ppbV(µg/m^3)
Vinyl chloride	ND	ND	ND	ND	ND	5.0(13)	ppbV(µg/m^3)
o-Xylene	ND	ND	ND	ND	ND	5.0(22)	ppbV(µg/m^3)
m/p-Xylene	ND	ND	**17(76)**	ND	ND	5.0(22)	ppbV(µg/m^3)
Dilution Factor	1	1	1	1	1		
Surrogate Recovery :						**QC Limits**	
4-Bromofluorobenzene	97%	103%	109%	106%	111%	60 - 140	

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/18/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964B
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/17/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA TO-15 - Volatile Organics by GC/MS in Air/ SUMMA Canister

Sample ID:	GP-9-F-10	**Practical Quantitation Limits**	**Units**
Analytes:			
Acetone	ND	20(48)	ppbV(µg/m^3)
Benzene	ND	5.0(16)	ppbV(µg/m^3)
Benzyl Chloride	ND	5.0(26)	ppbV(µg/m^3)
Bromodichloromethane	ND	5.0(34)	ppbV(µg/m^3)
Bromoform	ND	5.0(52)	ppbV(µg/m^3)
Bromomethane	ND	5.0(19)	ppbV(µg/m^3)
1,3-Butadiene	ND	5.0(11)	ppbV(µg/m^3)
2-Butanone (MEK)	ND	5.0(15)	ppbV(µg/m^3)
Carbon disulfide	ND	5.0(16)	ppbV(µg/m^3)
Carbon tetrachloride	ND	5.0(31)	ppbV(µg/m^3)
Chlorobenzene	ND	5.0(23)	ppbV(µg/m^3)
Chloroethane	ND	5.0(13)	ppbV(µg/m^3)
Chloroform	ND	5.0(24)	ppbV(µg/m^3)
Chloromethane	ND	20(41)	ppbV(µg/m^3)
3-Chloropropene	ND	20(63)	ppbV(µg/m^3)
Cyclohexane	ND	5.0(17)	ppbV(µg/m^3)
Dibromochloromethane	ND	5.0(42)	ppbV(µg/m^3)
1,2-Dibromoethane	ND	5.0(38)	ppbV(µg/m^3)
1,2-Dichlorobenzene	ND	5.0(30)	ppbV(µg/m^3)
1,3-Dichlorobenzene	ND	5.0(30)	ppbV(µg/m^3)
1,4-Dichlorobenzene	ND	5.0(30)	ppbV(µg/m^3)
1,1-Dichloroethane	ND	5.0(20)	ppbV(µg/m^3)
1,2-Dichloroethane	ND	5.0(20)	ppbV(µg/m^3)
1,1-Dichloroethene	ND	5.0(20)	ppbV(µg/m^3)
cis-1,2-dichloroethene	ND	5.0(20)	ppbV(µg/m^3)

ND = Not Detected

Jones Environmental, Inc.
Testing Laboratories
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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/18/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964B
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/17/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA TO-15 - Volatile Organics by GC/MS in Air/ SUMMA Canister

Sample ID:	GP-9-F-10	**Practical Quantitation Limits**	**Units**
Analytes:			
trans-1,2-dichloroethene	ND	5.0(20)	ppbV(µg/m^3)
1,2-Dichloropropane	ND	5.0(23)	ppbV(µg/m^3)
Cis-1,3-Dichloropropene	ND	5.0(23)	ppbV(µg/m^3)
Trans-1,3-Dichloropropene	ND	5.0(23)	ppbV(µg/m^3)
1,4-Dioxane	ND	20)72)	ppbV(µg/m^3)
Ethanol	ND	20(38)	ppbV(µg/m^3)
Ethyl benzene	ND	5.0(22)	ppbV(µg/m^3)
4-Ethyltoluene	ND	5.0(24)	ppbV(µg/m^3)
Freon 11	ND	5.0(28	ppbV(µg/m^3)
Freon 12	ND	5.0(25)	ppbV(µg/m^3)
Freon 113	ND	5.0(38)	ppbV(µg/m^3)
Freon 114	ND	5.0(35)	ppbV(µg/m^3)
Heptane	ND	5.0(20)	ppbV(µg/m^3)
Hexachloro-1,3-butadiene	ND	20(210)	ppbV(µg/m^3)
Hexane	ND	5.0(18)	ppbV(µg/m^3)
2-Hexanone (MBK)	ND	20(82)	ppbV(µg/m^3)
Isopropylbenzene (Cumene)	ND	5.0(24)	ppbV(µg/m^3)
4-Methyl-2-Pentanone (MIBK)	ND	5.0(20)	ppbV(µg/m^3)
Methylene chloride	ND	5.0(17)	ppbV(µg/m^3)
MTBE	ND	5.0(18)	ppbV(µg/m^3)
2-Propanol (Isopropyl Alcohol)	ND	20(49)	ppbV(µg/m^3)
Propylbenzene	ND	5.0(24)	ppbV(µg/m^3)
Styrene	ND	5.0(21)	ppbV(µg/m^3)
1,1,2,2-Tetrachloroethane	ND	5.0(34)	ppbV(µg/m^3)

ND = Not Detected

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JONES ENVIRONMENTAL

LABORATORY RESULTS

Client:	Converse Consultants, Inc.	**Report Date:**	02/18/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964B
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/17/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

EPA TO-15 - Volatile Organics by GC/MS in Air/ SUMMA Canister

Sample ID:	GP-9-F-10	**Practical Quantitation Limits**	**Units**
Analytes:			
Tetrachloroethene	ND	5.0(34)	ppbV(µg/m^3)
Tetrahydrofuran	ND	5.0(15)	ppbV(µg/m^3)
Toluene	ND	5.0(19)	ppbV(µg/m^3)
1,2,4-Trichlorobenzene	ND	20(150)	ppbV(µg/m^3)
1,1,1-Trichloroethane	ND	5.0(27)	ppbV(µg/m^3)
1,1,2-Trichloroethane	ND	5.0(27)	ppbV(µg/m^3)
Trichloroethene	ND	5.0(27)	ppbV(µg/m^3)
1,2,4-Trimethylbenzene	ND	5.0(24)	ppbV(µg/m^3)
1,3,5-Trimethylbenzene	ND	5.0(24)	ppbV(µg/m^3)
2,2,4-Trimethylpentane	ND	5.0(23)	ppbV(µg/m^3)
Vinyl chloride	ND	5.0(13)	ppbV(µg/m^3)
o-Xylene	ND	5.0(22)	ppbV(µg/m^3)
m/p-Xylene	ND	5.0(22)	ppbV(µg/m^3)
Dilution Factor	1		
Surrogate Recovery :		**QC Limits**	
4-Bromofluorobenzene	120%	60 - 140	

ND = Not Detected

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JONES ENVIRONMENTAL

QUALITY CONTROL INFORMATION

Client:	Converse Consultants, Inc.	**Report Date:**	02/18/10
Client Address:	185 E. Paularino Ave., Suite B Costa Mesa, CA 92626	**JEL Ref. No.:**	B-4964B
Attn:	William Ragsdale	**Date Sampled:**	02/15/10
		Date Received:	02/15/10
Project	Vacant Lot – Irwindale	**Date Analyzed:**	02/17/10
Project Address:	Corner of Live Oak Ave. & Arrow Hwy. Irwindale, CA	**Physical State:**	Soil Gas

---

EPA TO-15 - Volatile Organics by GC/MS in Air/ SUMMA Canister

Sample Spiked: AMBIENT AIR

Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)
1,1-Dichloroethylene	80%	81%	0.6%	60 - 140
Benzene	86%	87%	1.8%	60 - 140
Trichloroethylene	106%	104%	1.9%	60 - 140
Toluene	87%	90%	2.5%	60 - 140
Chlorobenzene	98%	98%	0.6%	60 - 140

Method Blank = Not Detected

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

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Fullerton, CA 92838
(714) 449-9937
Fax (714) 449-9685

Chain-of-Custody Record

Client: Converse Consultants
Date: 02/15/2010
Project Name:
Client Project #:
Project Address: Live Oak & Arrow Hwy, Irwindale, CA
Project Contact: William Raysdale

Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24-48 Hours
- ☐ Rush 72-96 Hours
- ☐ Normal
- ☒ Mobile Lab

SOIL GAS
Purge Vol: ☐ 1P ☒ 3P ☐ 7P
Tracer: nonane
Purge Rate: 200 cc/min

JEL Project #: B-4964B
Page: 2 of 2

Lab Use Only
Sample Condition as Received:
Chilled ☐ yes ☒ no
Sealed ☒ yes ☐ no

Sample ID	Purge Volume	Discussion	Date	Time	Laboratory Sample Number	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Soil Gas (SG)	Analysis Requested: TO-15						Number of Containers	Remarks/Special Instructions
GP-9-A-20			2/15/10	14:38	B-4964-11	SG	X						1	Summa (1 Liter)
GP-9-B-10			2/15/10	14:39	B-4964-12	SG	X						1	"
GP-9-C-10			2/15/10	14:41	B-4964-13	SG	X						1	"
GP 9-D-10			2/15/10	14:42	B-4964-14	SG	X						1	"
GP-9-E-10			2/15/10	14:42	B-4964-15	SG	X						1	"
GP-9-F-10			2/15/10	14:44	B-4964-16	SG	X						1	"

❶ Relinquished by (signature)	Date 2/15/10	❷ Received by (signature)	Date 2/15/10	Total Number of Containers
Company	Time	Company JEL	Time	
❸ Relinquished by (signature)	Date	❹ Received by Laboratory (signature)	Date	
Company	Time	Company	Time	

The delivery of samples and the signature on this Chain of Custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

Air Toxics LTD.
Laboratory Services Since 1989

12/29/2009
Mr. William Ragsdale
Converse Consultants
185 E. Paularino Avenue
Suite B
Costa Mesa CA 92626

Project Name: 17 Acro Lot
Project #: 09-42-138-02
Workorder #: 0912505

Dear Mr. William Ragsdale

The following report includes the data for the above referenced project for sample(s) received on 12/21/2009 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 (5&20 ppbv) are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kyle Vagadori at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kyle Vagadori
Project Manager

WORK ORDER #: 0912505

Work Order Summary

CLIENT:	Mr. William Ragsdale Converse Consultants 185 E. Paularino Avenue Suite B Costa Mesa, CA 92626	**BILL TO:**	Mr. William Ragsdale Converse Consultants 185 E. Paularino Avenue Suite B Costa Mesa, CA 92626
PHONE:	714-444-9660	**P.O. #**	09-42-138-02
FAX:		**PROJECT #**	09-42-138-02 17 Acro Lot
DATE RECEIVED:	12/21/2009	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	12/29/2009		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	GP1-5 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.3psi	15 psi
02A	GP3-5 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.2psi	15 psi
03A	GP3-10 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.1psi	15 psi
04A	GP6-5 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.1 "Hg	15 psi
05A	GP6-10 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.0 "Hg	15 psi
06A	GP7-5 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.2psi	15 psi
07A	GP7-10 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.0 "Hg	15 psi
07AA	GP7-10 Irwindale CA Lab Duplicate	Modified TO-15 (5&20 ppbv)	0.0 "Hg	15 psi
08A	GP8-5 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.2psi	15 psi
09A	GP8-10 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.2psi	15 psi
10A	GP-10-5 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.2 "Hg	15 psi
11A	GP10-10 Irwindale CA	Modified TO-15 (5&20 ppbv)	0.0 "Hg	15 psi
12A	GP9-10 Irwindale CA	Modified TO-15 (5&20 ppbv)	1.1 "Hg	15 psi
12AA	GP9-10 Irwindale CA Lab Duplicate	Modified TO-15 (5&20 ppbv)	1.1 "Hg	15 psi
13A	Lab Blank	Modified TO-15 (5&20 ppbv)	NA	NA
13B	Lab Blank	Modified TO-15 (5&20 ppbv)	NA	NA
14A	CCV	Modified TO-15 (5&20 ppbv)	NA	NA

Continued on next page

Air Toxics LTD.
Laboratory Services Since 1989

WORK ORDER #: 0912505

Work Order Summary

CLIENT:	Mr. William Ragsdale Converse Consultants 185 E. Paularino Avenue Suite B Costa Mesa, CA 92626	**BILL TO:**	Mr. William Ragsdale Converse Consultants 185 E. Paularino Avenue Suite B Costa Mesa, CA 92626
PHONE:	714-444-9660	**P.O. #**	09-42-138-02
FAX:		**PROJECT #**	09-42-138-02 17 Acro Lot
DATE RECEIVED:	12/21/2009	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	12/29/2009		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
14B	CCV	Modified TO-15 (5&20 ppbv)	NA	NA
15A	LCS	Modified TO-15 (5&20 ppbv)	NA	NA
15B	LCS	Modified TO-15 (5&20 ppbv)	NA	NA

CERTIFIED BY: Linda D. Fruman DATE: 12/29/09

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/09, Expiration date: 06/30/10
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Air Toxics Ltd.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15 Soil Gas
Converse Consultants
Workorder# 0912505

Twelve PAC250 Canister samples were received on December 21, 2009. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 50 mLs of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Daily CCV	+- 30% Difference	</= 30% Difference with two allowed out up to </=40%.; flag and narrate outliers
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

The Chain of Custody (COC) information for all samples did not match the entries on the sample tags with regard to sample identification. Therefore the information on the COC was used to process and report the samples.

Analytical Notes

The Laboratory Control Spike (LCS) did not meet acceptance criteria for Ethanol. Recoveries for this compound were 171% and 168%. Detected results are reported as estimated.

All Quality Control Limit exceedences and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction no

performed).

J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
UJ- Non-detected compound associated with low bias in the CCV
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

Air Toxics LTD.
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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS

Client Sample ID: GP1-5 Irwindale CA

Lab ID#: 0912505-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	9.9	18	37	69

Client Sample ID: GP3-5 Irwindale CA

Lab ID#: 0912505-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	10	11	37	41

Client Sample ID: GP3-10 Irwindale CA

Lab ID#: 0912505-03A

No Detections Were Found.

Client Sample ID: GP6-5 Irwindale CA

Lab ID#: 0912505-04A

No Detections Were Found.

Client Sample ID: GP6-10 Irwindale CA

Lab ID#: 0912505-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	10	20	38	77

Client Sample ID: GP7-5 Irwindale CA

Lab ID#: 0912505-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	10	23	37	88

Client Sample ID: GP7-10 Irwindale CA

Lab ID#: 0912505-07A

No Detections Were Found.

Air Toxics LTD.
Laboratory Services Since 1989

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS

Client Sample ID: GP7-10 Irwindale CA Lab Duplicate

Lab ID#: 0912505-07AA

No Detections Were Found.

Client Sample ID: GP8-5 Irwindale CA

Lab ID#: 0912505-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	10	13	37	49
Styrene	10	13	42	56

Client Sample ID: GP8-10 Irwindale CA

Lab ID#: 0912505-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	10	10	37	39
Tetrachloroethene	10	23	67	150

Client Sample ID: GP-10-5 Irwindale CA

Lab ID#: 0912505-10A

No Detections Were Found.

Client Sample ID: GP10-10 Irwindale CA

Lab ID#: 0912505-11A

No Detections Were Found.

Client Sample ID: GP9-10 Irwindale CA

Lab ID#: 0912505-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	21	75	47	160
Ethanol	85	94 J	160	180 J
Acetone	85	250	200	600
Carbon Disulfide	21	350	66	1100
2-Butanone (Methyl Ethyl Ketone)	21	36	62	100
Heptane	21	23	87	94
Toluene	21	33	80	120

Air Toxics LTD.
Laboratory Services Since 1989

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS

Client Sample ID: GP9-10 Irwindale CA Lab Duplicate

Lab ID#: 0912505-12AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	21	77	47	170
Acetone	85	200	200	480
Carbon Disulfide	21	330	66	1000
2-Butanone (Methyl Ethyl Ketone)	21	30	62	88
Toluene	21	32	80	120

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP1-5 Irwindale CA

Lab ID#: 0912505-01A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122605**	**Date of Collection:**	**12/18/09 7:07:00 AM**
Dil. Factor:	**1.98**	**Date of Analysis:**	**12/26/09 09:18 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	9.9	Not Detected	49	Not Detected
Freon 114	9.9	Not Detected	69	Not Detected
Chloromethane	40	Not Detected	82	Not Detected
Vinyl Chloride	9.9	Not Detected	25	Not Detected
1,3-Butadiene	9.9	Not Detected	22	Not Detected
Bromomethane	9.9	Not Detected	38	Not Detected
Chloroethane	9.9	Not Detected	26	Not Detected
Freon 11	9.9	Not Detected	56	Not Detected
Ethanol	40	Not Detected	75	Not Detected
Freon 113	9.9	Not Detected	76	Not Detected
1,1-Dichloroethene	9.9	Not Detected	39	Not Detected
Acetone	40	Not Detected	94	Not Detected
2-Propanol	40	Not Detected	97	Not Detected
Carbon Disulfide	9.9	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	120	Not Detected
Methylene Chloride	9.9	Not Detected	34	Not Detected
Methyl tert-butyl ether	9.9	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	9.9	Not Detected	39	Not Detected
Hexane	9.9	Not Detected	35	Not Detected
1,1-Dichloroethane	9.9	Not Detected	40	Not Detected
2-Butanone (Methyl Ethyl Ketone)	9.9	Not Detected	29	Not Detected
cis-1,2-Dichloroethene	9.9	Not Detected	39	Not Detected
Tetrahydrofuran	9.9	Not Detected	29	Not Detected
Chloroform	9.9	Not Detected	48	Not Detected
1,1,1-Trichloroethane	9.9	Not Detected	54	Not Detected
Cyclohexane	9.9	Not Detected	34	Not Detected
Carbon Tetrachloride	9.9	Not Detected	62	Not Detected
2,2,4-Trimethylpentane	9.9	Not Detected	46	Not Detected
Benzene	9.9	Not Detected	32	Not Detected
1,2-Dichloroethane	9.9	Not Detected	40	Not Detected
Heptane	9.9	Not Detected	40	Not Detected
Trichloroethene	9.9	Not Detected	53	Not Detected
1,2-Dichloropropane	9.9	Not Detected	46	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	9.9	Not Detected	66	Not Detected
cis-1,3-Dichloropropene	9.9	Not Detected	45	Not Detected
4-Methyl-2-pentanone	9.9	Not Detected	40	Not Detected
Toluene	9.9	18	37	69
trans-1,3-Dichloropropene	9.9	Not Detected	45	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP1-5 Irwindale CA

Lab ID#: 0912505-01A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122605**	**Date of Collection: 12/18/09 7:07:00 AM**	
Dil. Factor:	**1.98**	**Date of Analysis: 12/26/09 09:18 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	9.9	Not Detected	54	Not Detected
Tetrachloroethene	9.9	Not Detected	67	Not Detected
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	9.9	Not Detected	84	Not Detected
1,2-Dibromoethane (EDB)	9.9	Not Detected	76	Not Detected
Chlorobenzene	9.9	Not Detected	46	Not Detected
Ethyl Benzene	9.9	Not Detected	43	Not Detected
m,p-Xylene	9.9	Not Detected	43	Not Detected
o-Xylene	9.9	Not Detected	43	Not Detected
Styrene	9.9	Not Detected	42	Not Detected
Bromoform	9.9	Not Detected	100	Not Detected
Cumene	9.9	Not Detected	49	Not Detected
1,1,2,2-Tetrachloroethane	9.9	Not Detected	68	Not Detected
Propylbenzene	9.9	Not Detected	49	Not Detected
4-Ethyltoluene	9.9	Not Detected	49	Not Detected
1,3,5-Trimethylbenzene	9.9	Not Detected	49	Not Detected
1,2,4-Trimethylbenzene	9.9	Not Detected	49	Not Detected
1,3-Dichlorobenzene	9.9	Not Detected	60	Not Detected
1,4-Dichlorobenzene	9.9	Not Detected	60	Not Detected
alpha-Chlorotoluene	9.9	Not Detected	51	Not Detected
1,2-Dichlorobenzene	9.9	Not Detected	60	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	290	Not Detected
Hexachlorobutadiene	40	Not Detected	420	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	100	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP3-5 Irwindale CA

Lab ID#: 0912505-02A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122606**	**Date of Collection:**	**12/18/09 7:27:00 AM**
Dil. Factor:	**1.99**	**Date of Analysis:**	**12/26/09 09:42 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	49	Not Detected
Freon 114	10	Not Detected	70	Not Detected
Chloromethane	40	Not Detected	82	Not Detected
Vinyl Chloride	10	Not Detected	25	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	26	Not Detected
Freon 11	10	Not Detected	56	Not Detected
Ethanol	40	Not Detected	75	Not Detected
Freon 113	10	Not Detected	76	Not Detected
1,1-Dichloroethene	10	Not Detected	39	Not Detected
Acetone	40	Not Detected	94	Not Detected
2-Propanol	40	Not Detected	98	Not Detected
Carbon Disulfide	10	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	120	Not Detected
Methylene Chloride	10	Not Detected	34	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	39	Not Detected
Hexane	10	Not Detected	35	Not Detected
1,1-Dichloroethane	10	Not Detected	40	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	29	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	39	Not Detected
Tetrahydrofuran	10	Not Detected	29	Not Detected
Chloroform	10	Not Detected	48	Not Detected
1,1,1-Trichloroethane	10	Not Detected	54	Not Detected
Cyclohexane	10	Not Detected	34	Not Detected
Carbon Tetrachloride	10	Not Detected	63	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	46	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	40	Not Detected
Heptane	10	Not Detected	41	Not Detected
Trichloroethene	10	Not Detected	53	Not Detected
1,2-Dichloropropane	10	Not Detected	46	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	10	Not Detected	67	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	45	Not Detected
4-Methyl-2-pentanone	10	Not Detected	41	Not Detected
Toluene	10	11	37	41
trans-1,3-Dichloropropene	10	Not Detected	45	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP3-5 Irwindale CA

Lab ID#: 0912505-02A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122606**	**Date of Collection: 12/18/09 7:27:00 AM**	
Dil. Factor:	**1.99**	**Date of Analysis: 12/26/09 09:42 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	54	Not Detected
Tetrachloroethene	10	Not Detected	67	Not Detected
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	10	Not Detected	85	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	76	Not Detected
Chlorobenzene	10	Not Detected	46	Not Detected
Ethyl Benzene	10	Not Detected	43	Not Detected
m,p-Xylene	10	Not Detected	43	Not Detected
o-Xylene	10	Not Detected	43	Not Detected
Styrene	10	Not Detected	42	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	49	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	68	Not Detected
Propylbenzene	10	Not Detected	49	Not Detected
4-Ethyltoluene	10	Not Detected	49	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	49	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	49	Not Detected
1,3-Dichlorobenzene	10	Not Detected	60	Not Detected
1,4-Dichlorobenzene	10	Not Detected	60	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	60	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	300	Not Detected
Hexachlorobutadiene	40	Not Detected	420	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	100	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP3-10 Irwindale CA

Lab ID#: 0912505-03A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122607**	**Date of Collection:**	**12/18/09 7:20:00 AM**
Dil. Factor:	**2.01**	**Date of Analysis:**	**12/26/09 10:05 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	50	Not Detected
Freon 114	10	Not Detected	70	Not Detected
Chloromethane	40	Not Detected	83	Not Detected
Vinyl Chloride	10	Not Detected	26	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	26	Not Detected
Freon 11	10	Not Detected	56	Not Detected
Ethanol	40	Not Detected	76	Not Detected
Freon 113	10	Not Detected	77	Not Detected
1,1-Dichloroethene	10	Not Detected	40	Not Detected
Acetone	40	Not Detected	95	Not Detected
2-Propanol	40	Not Detected	99	Not Detected
Carbon Disulfide	10	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	120	Not Detected
Methylene Chloride	10	Not Detected	35	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Hexane	10	Not Detected	35	Not Detected
1,1-Dichloroethane	10	Not Detected	41	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	30	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Tetrahydrofuran	10	Not Detected	30	Not Detected
Chloroform	10	Not Detected	49	Not Detected
1,1,1-Trichloroethane	10	Not Detected	55	Not Detected
Cyclohexane	10	Not Detected	34	Not Detected
Carbon Tetrachloride	10	Not Detected	63	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	47	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	41	Not Detected
Heptane	10	Not Detected	41	Not Detected
Trichloroethene	10	Not Detected	54	Not Detected
1,2-Dichloropropane	10	Not Detected	46	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	10	Not Detected	67	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	46	Not Detected
4-Methyl-2-pentanone	10	Not Detected	41	Not Detected
Toluene	10	Not Detected	38	Not Detected
trans-1,3-Dichloropropene	10	Not Detected	46	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP3-10 Irwindale CA

Lab ID#: 0912505-03A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122607**	**Date of Collection: 12/18/09 7:20:00 AM**	
Dil. Factor:	**2.01**	**Date of Analysis: 12/26/09 10:05 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	55	Not Detected
Tetrachloroethene	10	Not Detected	68	Not Detected
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	10	Not Detected	86	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	77	Not Detected
Chlorobenzene	10	Not Detected	46	Not Detected
Ethyl Benzene	10	Not Detected	44	Not Detected
m,p-Xylene	10	Not Detected	44	Not Detected
o-Xylene	10	Not Detected	44	Not Detected
Styrene	10	Not Detected	43	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	49	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	69	Not Detected
Propylbenzene	10	Not Detected	49	Not Detected
4-Ethyltoluene	10	Not Detected	49	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	49	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	49	Not Detected
1,3-Dichlorobenzene	10	Not Detected	60	Not Detected
1,4-Dichlorobenzene	10	Not Detected	60	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	60	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	300	Not Detected
Hexachlorobutadiene	40	Not Detected	430	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	101	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP6-5 Irwindale CA

Lab ID#: 0912505-04A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122608**	**Date of Collection:**	**12/18/09 8:00:00 AM**
Dil. Factor:	**2.03**	**Date of Analysis:**	**12/26/09 10:34 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	50	Not Detected
Freon 114	10	Not Detected	71	Not Detected
Chloromethane	41	Not Detected	84	Not Detected
Vinyl Chloride	10	Not Detected	26	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	27	Not Detected
Freon 11	10	Not Detected	57	Not Detected
Ethanol	41	Not Detected	76	Not Detected
Freon 113	10	Not Detected	78	Not Detected
1,1-Dichloroethene	10	Not Detected	40	Not Detected
Acetone	41	Not Detected	96	Not Detected
2-Propanol	41	Not Detected	100	Not Detected
Carbon Disulfide	10	Not Detected	32	Not Detected
3-Chloropropene	41	Not Detected	130	Not Detected
Methylene Chloride	10	Not Detected	35	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Hexane	10	Not Detected	36	Not Detected
1,1-Dichloroethane	10	Not Detected	41	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	30	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Tetrahydrofuran	10	Not Detected	30	Not Detected
Chloroform	10	Not Detected	50	Not Detected
1,1,1-Trichloroethane	10	Not Detected	55	Not Detected
Cyclohexane	10	Not Detected	35	Not Detected
Carbon Tetrachloride	10	Not Detected	64	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	47	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	41	Not Detected
Heptane	10	Not Detected	42	Not Detected
Trichloroethene	10	Not Detected	54	Not Detected
1,2-Dichloropropane	10	Not Detected	47	Not Detected
1,4-Dioxane	41	Not Detected	150	Not Detected
Bromodichloromethane	10	Not Detected	68	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	46	Not Detected
4-Methyl-2-pentanone	10	Not Detected	42	Not Detected
Toluene	10	Not Detected	38	Not Detected
trans-1,3-Dichloropropene	10	Not Detected	46	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP6-5 Irwindale CA

Lab ID#: 0912505-04A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122608**	**Date of Collection:**	**12/18/09 8:00:00 AM**
Dil. Factor:	**2.03**	**Date of Analysis:**	**12/26/09 10:34 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	55	Not Detected
Tetrachloroethene	10	Not Detected	69	Not Detected
2-Hexanone	41	Not Detected	170	Not Detected
Dibromochloromethane	10	Not Detected	86	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	78	Not Detected
Chlorobenzene	10	Not Detected	47	Not Detected
Ethyl Benzene	10	Not Detected	44	Not Detected
m,p-Xylene	10	Not Detected	44	Not Detected
o-Xylene	10	Not Detected	44	Not Detected
Styrene	10	Not Detected	43	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	50	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	70	Not Detected
Propylbenzene	10	Not Detected	50	Not Detected
4-Ethyltoluene	10	Not Detected	50	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	50	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	50	Not Detected
1,3-Dichlorobenzene	10	Not Detected	61	Not Detected
1,4-Dichlorobenzene	10	Not Detected	61	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	61	Not Detected
1,2,4-Trichlorobenzene	41	Not Detected	300	Not Detected
Hexachlorobutadiene	41	Not Detected	430	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	98	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP6-10 Irwindale CA

Lab ID#: 0912505-05A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122609**	**Date of Collection:**	**12/18/09 7:58:00 AM**
Dil. Factor:	**2.02**	**Date of Analysis:**	**12/26/09 10:54 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	50	Not Detected
Freon 114	10	Not Detected	71	Not Detected
Chloromethane	40	Not Detected	83	Not Detected
Vinyl Chloride	10	Not Detected	26	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	27	Not Detected
Freon 11	10	Not Detected	57	Not Detected
Ethanol	40	Not Detected	76	Not Detected
Freon 113	10	Not Detected	77	Not Detected
1,1-Dichloroethene	10	Not Detected	40	Not Detected
Acetone	40	Not Detected	96	Not Detected
2-Propanol	40	Not Detected	99	Not Detected
Carbon Disulfide	10	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	130	Not Detected
Methylene Chloride	10	Not Detected	35	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Hexane	10	Not Detected	36	Not Detected
1,1-Dichloroethane	10	Not Detected	41	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	30	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Tetrahydrofuran	10	Not Detected	30	Not Detected
Chloroform	10	Not Detected	49	Not Detected
1,1,1-Trichloroethane	10	Not Detected	55	Not Detected
Cyclohexane	10	Not Detected	35	Not Detected
Carbon Tetrachloride	10	Not Detected	64	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	47	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	41	Not Detected
Heptane	10	Not Detected	41	Not Detected
Trichloroethene	10	Not Detected	54	Not Detected
1,2-Dichloropropane	10	Not Detected	47	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	10	Not Detected	68	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	46	Not Detected
4-Methyl-2-pentanone	10	Not Detected	41	Not Detected
Toluene	10	20	38	77
trans-1,3-Dichloropropene	10	Not Detected	46	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP6-10 Irwindale CA

Lab ID#: 0912505-05A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122609**	**Date of Collection: 12/18/09 7:58:00 AM**	
Dil. Factor:	**2.02**	**Date of Analysis: 12/26/09 10:54 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	55	Not Detected
Tetrachloroethene	10	Not Detected	68	Not Detected
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	10	Not Detected	86	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	78	Not Detected
Chlorobenzene	10	Not Detected	46	Not Detected
Ethyl Benzene	10	Not Detected	44	Not Detected
m,p-Xylene	10	Not Detected	44	Not Detected
o-Xylene	10	Not Detected	44	Not Detected
Styrene	10	Not Detected	43	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	50	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	69	Not Detected
Propylbenzene	10	Not Detected	50	Not Detected
4-Ethyltoluene	10	Not Detected	50	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	50	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	50	Not Detected
1,3-Dichlorobenzene	10	Not Detected	61	Not Detected
1,4-Dichlorobenzene	10	Not Detected	61	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	61	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	300	Not Detected
Hexachlorobutadiene	40	Not Detected	430	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	100	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP7-5 Irwindale CA

Lab ID#: 0912505-06A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122610**	**Date of Collection:**	**12/18/09 7:32:00 AM**
Dil. Factor:	**1.99**	**Date of Analysis:**	**12/26/09 11:15 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	49	Not Detected
Freon 114	10	Not Detected	70	Not Detected
Chloromethane	40	Not Detected	82	Not Detected
Vinyl Chloride	10	Not Detected	25	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	26	Not Detected
Freon 11	10	Not Detected	56	Not Detected
Ethanol	40	Not Detected	75	Not Detected
Freon 113	10	Not Detected	76	Not Detected
1,1-Dichloroethene	10	Not Detected	39	Not Detected
Acetone	40	Not Detected	94	Not Detected
2-Propanol	40	Not Detected	98	Not Detected
Carbon Disulfide	10	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	120	Not Detected
Methylene Chloride	10	Not Detected	34	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	39	Not Detected
Hexane	10	Not Detected	35	Not Detected
1,1-Dichloroethane	10	Not Detected	40	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	29	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	39	Not Detected
Tetrahydrofuran	10	Not Detected	29	Not Detected
Chloroform	10	Not Detected	48	Not Detected
1,1,1-Trichloroethane	10	Not Detected	54	Not Detected
Cyclohexane	10	Not Detected	34	Not Detected
Carbon Tetrachloride	10	Not Detected	63	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	46	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	40	Not Detected
Heptane	10	Not Detected	41	Not Detected
Trichloroethene	10	Not Detected	53	Not Detected
1,2-Dichloropropane	10	Not Detected	46	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	10	Not Detected	67	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	45	Not Detected
4-Methyl-2-pentanone	10	Not Detected	41	Not Detected
Toluene	10	23	37	88
trans-1,3-Dichloropropene	10	Not Detected	45	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP7-5 Irwindale CA

Lab ID#: 0912505-06A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122610**	**Date of Collection: 12/18/09 7:32:00 AM**	
Dil. Factor:	**1.99**	**Date of Analysis: 12/26/09 11:15 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	54	Not Detected
Tetrachloroethene	10	Not Detected	67	Not Detected
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	10	Not Detected	85	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	76	Not Detected
Chlorobenzene	10	Not Detected	46	Not Detected
Ethyl Benzene	10	Not Detected	43	Not Detected
m,p-Xylene	10	Not Detected	43	Not Detected
o-Xylene	10	Not Detected	43	Not Detected
Styrene	10	Not Detected	42	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	49	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	68	Not Detected
Propylbenzene	10	Not Detected	49	Not Detected
4-Ethyltoluene	10	Not Detected	49	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	49	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	49	Not Detected
1,3-Dichlorobenzene	10	Not Detected	60	Not Detected
1,4-Dichlorobenzene	10	Not Detected	60	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	60	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	300	Not Detected
Hexachlorobutadiene	40	Not Detected	420	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	101	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP7-10 Irwindale CA

Lab ID#: 0912505-07A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122611**	**Date of Collection: 12/18/09 7:21:00 AM**	
Dil. Factor:	**2.02**	**Date of Analysis: 12/26/09 11:38 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	50	Not Detected
Freon 114	10	Not Detected	71	Not Detected
Chloromethane	40	Not Detected	83	Not Detected
Vinyl Chloride	10	Not Detected	26	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	27	Not Detected
Freon 11	10	Not Detected	57	Not Detected
Ethanol	40	Not Detected	76	Not Detected
Freon 113	10	Not Detected	77	Not Detected
1,1-Dichloroethene	10	Not Detected	40	Not Detected
Acetone	40	Not Detected	96	Not Detected
2-Propanol	40	Not Detected	99	Not Detected
Carbon Disulfide	10	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	130	Not Detected
Methylene Chloride	10	Not Detected	35	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Hexane	10	Not Detected	36	Not Detected
1,1-Dichloroethane	10	Not Detected	41	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	30	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Tetrahydrofuran	10	Not Detected	30	Not Detected
Chloroform	10	Not Detected	49	Not Detected
1,1,1-Trichloroethane	10	Not Detected	55	Not Detected
Cyclohexane	10	Not Detected	35	Not Detected
Carbon Tetrachloride	10	Not Detected	64	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	47	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	41	Not Detected
Heptane	10	Not Detected	41	Not Detected
Trichloroethene	10	Not Detected	54	Not Detected
1,2-Dichloropropane	10	Not Detected	47	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	10	Not Detected	68	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	46	Not Detected
4-Methyl-2-pentanone	10	Not Detected	41	Not Detected
Toluene	10	Not Detected	38	Not Detected
trans-1,3-Dichloropropene	10	Not Detected	46	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP7-10 Irwindale CA

Lab ID#: 0912505-07A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122611**	**Date of Collection: 12/18/09 7:21:00 AM**	
Dil. Factor:	**2.02**	**Date of Analysis: 12/26/09 11:38 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	55	Not Detected
Tetrachloroethene	10	Not Detected	68	Not Detected
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	10	Not Detected	86	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	78	Not Detected
Chlorobenzene	10	Not Detected	46	Not Detected
Ethyl Benzene	10	Not Detected	44	Not Detected
m,p-Xylene	10	Not Detected	44	Not Detected
o-Xylene	10	Not Detected	44	Not Detected
Styrene	10	Not Detected	43	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	50	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	69	Not Detected
Propylbenzene	10	Not Detected	50	Not Detected
4-Ethyltoluene	10	Not Detected	50	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	50	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	50	Not Detected
1,3-Dichlorobenzene	10	Not Detected	61	Not Detected
1,4-Dichlorobenzene	10	Not Detected	61	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	61	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	300	Not Detected
Hexachlorobutadiene	40	Not Detected	430	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	99	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP7-10 Irwindale CA Lab Duplicate

Lab ID#: 0912505-07AA

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122618**	**Date of Collection:**	**12/18/09 7:21:00 AM**
Dil. Factor:	**2.02**	**Date of Analysis:**	**12/26/09 03:51 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	50	Not Detected
Freon 114	10	Not Detected	71	Not Detected
Chloromethane	40	Not Detected	83	Not Detected
Vinyl Chloride	10	Not Detected	26	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	27	Not Detected
Freon 11	10	Not Detected	57	Not Detected
Ethanol	40	Not Detected	76	Not Detected
Freon 113	10	Not Detected	77	Not Detected
1,1-Dichloroethene	10	Not Detected	40	Not Detected
Acetone	40	Not Detected	96	Not Detected
2-Propanol	40	Not Detected	99	Not Detected
Carbon Disulfide	10	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	130	Not Detected
Methylene Chloride	10	Not Detected	35	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Hexane	10	Not Detected	36	Not Detected
1,1-Dichloroethane	10	Not Detected	41	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	30	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Tetrahydrofuran	10	Not Detected	30	Not Detected
Chloroform	10	Not Detected	49	Not Detected
1,1,1-Trichloroethane	10	Not Detected	55	Not Detected
Cyclohexane	10	Not Detected	35	Not Detected
Carbon Tetrachloride	10	Not Detected	64	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	47	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	41	Not Detected
Heptane	10	Not Detected	41	Not Detected
Trichloroethene	10	Not Detected	54	Not Detected
1,2-Dichloropropane	10	Not Detected	47	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	10	Not Detected	68	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	46	Not Detected
4-Methyl-2-pentanone	10	Not Detected	41	Not Detected
Toluene	10	Not Detected	38	Not Detected
trans-1,3-Dichloropropene	10	Not Detected	46	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP7-10 Irwindale CA Lab Duplicate

Lab ID#: 0912505-07AA

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122618**	**Date of Collection:**	**12/18/09 7:21:00 AM**
Dil. Factor:	**2.02**	**Date of Analysis:**	**12/26/09 03:51 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	55	Not Detected
Tetrachloroethene	10	Not Detected	68	Not Detected
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	10	Not Detected	86	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	78	Not Detected
Chlorobenzene	10	Not Detected	46	Not Detected
Ethyl Benzene	10	Not Detected	44	Not Detected
m,p-Xylene	10	Not Detected	44	Not Detected
o-Xylene	10	Not Detected	44	Not Detected
Styrene	10	Not Detected	43	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	50	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	69	Not Detected
Propylbenzene	10	Not Detected	50	Not Detected
4-Ethyltoluene	10	Not Detected	50	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	50	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	50	Not Detected
1,3-Dichlorobenzene	10	Not Detected	61	Not Detected
1,4-Dichlorobenzene	10	Not Detected	61	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	61	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	300	Not Detected
Hexachlorobutadiene	40	Not Detected	430	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	97	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP8-5 Irwindale CA

Lab ID#: 0912505-08A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122612**	**Date of Collection:**	**12/18/09 7:41:00 AM**
Dil. Factor:	**1.99**	**Date of Analysis:**	**12/26/09 11:58 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	49	Not Detected
Freon 114	10	Not Detected	70	Not Detected
Chloromethane	40	Not Detected	82	Not Detected
Vinyl Chloride	10	Not Detected	25	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	26	Not Detected
Freon 11	10	Not Detected	56	Not Detected
Ethanol	40	Not Detected	75	Not Detected
Freon 113	10	Not Detected	76	Not Detected
1,1-Dichloroethene	10	Not Detected	39	Not Detected
Acetone	40	Not Detected	94	Not Detected
2-Propanol	40	Not Detected	98	Not Detected
Carbon Disulfide	10	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	120	Not Detected
Methylene Chloride	10	Not Detected	34	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	39	Not Detected
Hexane	10	Not Detected	35	Not Detected
1,1-Dichloroethane	10	Not Detected	40	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	29	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	39	Not Detected
Tetrahydrofuran	10	Not Detected	29	Not Detected
Chloroform	10	Not Detected	48	Not Detected
1,1,1-Trichloroethane	10	Not Detected	54	Not Detected
Cyclohexane	10	Not Detected	34	Not Detected
Carbon Tetrachloride	10	Not Detected	63	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	46	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	40	Not Detected
Heptane	10	Not Detected	41	Not Detected
Trichloroethene	10	Not Detected	53	Not Detected
1,2-Dichloropropane	10	Not Detected	46	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	10	Not Detected	67	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	45	Not Detected
4-Methyl-2-pentanone	10	Not Detected	41	Not Detected
Toluene	10	13	37	49
trans-1,3-Dichloropropene	10	Not Detected	45	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP8-5 Irwindale CA

Lab ID#: 0912505-08A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122612**	**Date of Collection:**	**12/18/09 7:41:00 AM**
Dil. Factor:	**1.99**	**Date of Analysis:**	**12/26/09 11:58 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	54	Not Detected
Tetrachloroethene	10	Not Detected	67	Not Detected
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	10	Not Detected	85	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	76	Not Detected
Chlorobenzene	10	Not Detected	46	Not Detected
Ethyl Benzene	10	Not Detected	43	Not Detected
m,p-Xylene	10	Not Detected	43	Not Detected
o-Xylene	10	Not Detected	43	Not Detected
Styrene	10	13	42	56
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	49	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	68	Not Detected
Propylbenzene	10	Not Detected	49	Not Detected
4-Ethyltoluene	10	Not Detected	49	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	49	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	49	Not Detected
1,3-Dichlorobenzene	10	Not Detected	60	Not Detected
1,4-Dichlorobenzene	10	Not Detected	60	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	60	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	300	Not Detected
Hexachlorobutadiene	40	Not Detected	420	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	100	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP8-10 Irwindale CA

Lab ID#: 0912505-09A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122613**	**Date of Collection:**	**12/18/09 7:42:00 AM**
Dil. Factor:	**1.99**	**Date of Analysis:**	**12/26/09 12:18 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	49	Not Detected
Freon 114	10	Not Detected	70	Not Detected
Chloromethane	40	Not Detected	82	Not Detected
Vinyl Chloride	10	Not Detected	25	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	26	Not Detected
Freon 11	10	Not Detected	56	Not Detected
Ethanol	40	Not Detected	75	Not Detected
Freon 113	10	Not Detected	76	Not Detected
1,1-Dichloroethene	10	Not Detected	39	Not Detected
Acetone	40	Not Detected	94	Not Detected
2-Propanol	40	Not Detected	98	Not Detected
Carbon Disulfide	10	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	120	Not Detected
Methylene Chloride	10	Not Detected	34	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	39	Not Detected
Hexane	10	Not Detected	35	Not Detected
1,1-Dichloroethane	10	Not Detected	40	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	29	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	39	Not Detected
Tetrahydrofuran	10	Not Detected	29	Not Detected
Chloroform	10	Not Detected	48	Not Detected
1,1,1-Trichloroethane	10	Not Detected	54	Not Detected
Cyclohexane	10	Not Detected	34	Not Detected
Carbon Tetrachloride	10	Not Detected	63	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	46	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	40	Not Detected
Heptane	10	Not Detected	41	Not Detected
Trichloroethene	10	Not Detected	53	Not Detected
1,2-Dichloropropane	10	Not Detected	46	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	10	Not Detected	67	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	45	Not Detected
4-Methyl-2-pentanone	10	Not Detected	41	Not Detected
Toluene	10	10	37	39
trans-1,3-Dichloropropene	10	Not Detected	45	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP8-10 Irwindale CA

Lab ID#: 0912505-09A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122613**	**Date of Collection:**	**12/18/09 7:42:00 AM**
Dil. Factor:	**1.99**	**Date of Analysis:**	**12/26/09 12:18 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	54	Not Detected
Tetrachloroethene	10	23	67	150
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	10	Not Detected	85	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	76	Not Detected
Chlorobenzene	10	Not Detected	46	Not Detected
Ethyl Benzene	10	Not Detected	43	Not Detected
m,p-Xylene	10	Not Detected	43	Not Detected
o-Xylene	10	Not Detected	43	Not Detected
Styrene	10	Not Detected	42	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	49	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	68	Not Detected
Propylbenzene	10	Not Detected	49	Not Detected
4-Ethyltoluene	10	Not Detected	49	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	49	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	49	Not Detected
1,3-Dichlorobenzene	10	Not Detected	60	Not Detected
1,4-Dichlorobenzene	10	Not Detected	60	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	60	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	300	Not Detected
Hexachlorobutadiene	40	Not Detected	420	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	100	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP-10-5 Irwindale CA

Lab ID#: 0912505-10A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122614**	**Date of Collection:**	**12/18/09 7:44:00 AM**
Dil. Factor:	**2.03**	**Date of Analysis:**	**12/26/09 01:04 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	50	Not Detected
Freon 114	10	Not Detected	71	Not Detected
Chloromethane	41	Not Detected	84	Not Detected
Vinyl Chloride	10	Not Detected	26	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	27	Not Detected
Freon 11	10	Not Detected	57	Not Detected
Ethanol	41	Not Detected	76	Not Detected
Freon 113	10	Not Detected	78	Not Detected
1,1-Dichloroethene	10	Not Detected	40	Not Detected
Acetone	41	Not Detected	96	Not Detected
2-Propanol	41	Not Detected	100	Not Detected
Carbon Disulfide	10	Not Detected	32	Not Detected
3-Chloropropene	41	Not Detected	130	Not Detected
Methylene Chloride	10	Not Detected	35	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Hexane	10	Not Detected	36	Not Detected
1,1-Dichloroethane	10	Not Detected	41	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	30	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Tetrahydrofuran	10	Not Detected	30	Not Detected
Chloroform	10	Not Detected	50	Not Detected
1,1,1-Trichloroethane	10	Not Detected	55	Not Detected
Cyclohexane	10	Not Detected	35	Not Detected
Carbon Tetrachloride	10	Not Detected	64	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	47	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	41	Not Detected
Heptane	10	Not Detected	42	Not Detected
Trichloroethene	10	Not Detected	54	Not Detected
1,2-Dichloropropane	10	Not Detected	47	Not Detected
1,4-Dioxane	41	Not Detected	150	Not Detected
Bromodichloromethane	10	Not Detected	68	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	46	Not Detected
4-Methyl-2-pentanone	10	Not Detected	42	Not Detected
Toluene	10	Not Detected	38	Not Detected
trans-1,3-Dichloropropene	10	Not Detected	46	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP-10-5 Irwindale CA

Lab ID#: 0912505-10A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122614**	**Date of Collection: 12/18/09 7:44:00 AM**	
Dil. Factor:	**2.03**	**Date of Analysis: 12/26/09 01:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	55	Not Detected
Tetrachloroethene	10	Not Detected	69	Not Detected
2-Hexanone	41	Not Detected	170	Not Detected
Dibromochloromethane	10	Not Detected	86	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	78	Not Detected
Chlorobenzene	10	Not Detected	47	Not Detected
Ethyl Benzene	10	Not Detected	44	Not Detected
m,p-Xylene	10	Not Detected	44	Not Detected
o-Xylene	10	Not Detected	44	Not Detected
Styrene	10	Not Detected	43	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	50	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	70	Not Detected
Propylbenzene	10	Not Detected	50	Not Detected
4-Ethyltoluene	10	Not Detected	50	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	50	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	50	Not Detected
1,3-Dichlorobenzene	10	Not Detected	61	Not Detected
1,4-Dichlorobenzene	10	Not Detected	61	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	61	Not Detected
1,2,4-Trichlorobenzene	41	Not Detected	300	Not Detected
Hexachlorobutadiene	41	Not Detected	430	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	99	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP10-10 Irwindale CA

Lab ID#: 0912505-11A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122615**	**Date of Collection: 12/18/09 7:51:00 AM**	
Dil. Factor:	**2.02**	**Date of Analysis: 12/26/09 01:32 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	50	Not Detected
Freon 114	10	Not Detected	71	Not Detected
Chloromethane	40	Not Detected	83	Not Detected
Vinyl Chloride	10	Not Detected	26	Not Detected
1,3-Butadiene	10	Not Detected	22	Not Detected
Bromomethane	10	Not Detected	39	Not Detected
Chloroethane	10	Not Detected	27	Not Detected
Freon 11	10	Not Detected	57	Not Detected
Ethanol	40	Not Detected	76	Not Detected
Freon 113	10	Not Detected	77	Not Detected
1,1-Dichloroethene	10	Not Detected	40	Not Detected
Acetone	40	Not Detected	96	Not Detected
2-Propanol	40	Not Detected	99	Not Detected
Carbon Disulfide	10	Not Detected	31	Not Detected
3-Chloropropene	40	Not Detected	130	Not Detected
Methylene Chloride	10	Not Detected	35	Not Detected
Methyl tert-butyl ether	10	Not Detected	36	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Hexane	10	Not Detected	36	Not Detected
1,1-Dichloroethane	10	Not Detected	41	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	30	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Tetrahydrofuran	10	Not Detected	30	Not Detected
Chloroform	10	Not Detected	49	Not Detected
1,1,1-Trichloroethane	10	Not Detected	55	Not Detected
Cyclohexane	10	Not Detected	35	Not Detected
Carbon Tetrachloride	10	Not Detected	64	Not Detected
2,2,4-Trimethylpentane	10	Not Detected	47	Not Detected
Benzene	10	Not Detected	32	Not Detected
1,2-Dichloroethane	10	Not Detected	41	Not Detected
Heptane	10	Not Detected	41	Not Detected
Trichloroethene	10	Not Detected	54	Not Detected
1,2-Dichloropropane	10	Not Detected	47	Not Detected
1,4-Dioxane	40	Not Detected	140	Not Detected
Bromodichloromethane	10	Not Detected	68	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	46	Not Detected
4-Methyl-2-pentanone	10	Not Detected	41	Not Detected
Toluene	10	Not Detected	38	Not Detected
trans-1,3-Dichloropropene	10	Not Detected	46	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP10-10 Irwindale CA

Lab ID#: 0912505-11A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122615**	**Date of Collection:**	**12/18/09 7:51:00 AM**
Dil. Factor:	**2.02**	**Date of Analysis:**	**12/26/09 01:32 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	10	Not Detected	55	Not Detected
Tetrachloroethene	10	Not Detected	68	Not Detected
2-Hexanone	40	Not Detected	160	Not Detected
Dibromochloromethane	10	Not Detected	86	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	78	Not Detected
Chlorobenzene	10	Not Detected	46	Not Detected
Ethyl Benzene	10	Not Detected	44	Not Detected
m,p-Xylene	10	Not Detected	44	Not Detected
o-Xylene	10	Not Detected	44	Not Detected
Styrene	10	Not Detected	43	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	50	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	69	Not Detected
Propylbenzene	10	Not Detected	50	Not Detected
4-Ethyltoluene	10	Not Detected	50	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	50	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	50	Not Detected
1,3-Dichlorobenzene	10	Not Detected	61	Not Detected
1,4-Dichlorobenzene	10	Not Detected	61	Not Detected
alpha-Chlorotoluene	10	Not Detected	52	Not Detected
1,2-Dichlorobenzene	10	Not Detected	61	Not Detected
1,2,4-Trichlorobenzene	40	Not Detected	300	Not Detected
Hexachlorobutadiene	40	Not Detected	430	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	96	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP9-10 Irwindale CA

Lab ID#: 0912505-12A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122905**	**Date of Collection:**	**12/18/09 11:23:00 AM**
Dil. Factor:	**4.24**	**Date of Analysis:**	**12/29/09 12:43 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	21	Not Detected	100	Not Detected
Freon 114	21	Not Detected	150	Not Detected
Chloromethane	85	Not Detected	180	Not Detected
Vinyl Chloride	21	Not Detected	54	Not Detected
1,3-Butadiene	21	75	47	160
Bromomethane	21	Not Detected	82	Not Detected
Chloroethane	21	Not Detected	56	Not Detected
Freon 11	21	Not Detected	120	Not Detected
Ethanol	85	94 J	160	180 J
Freon 113	21	Not Detected	160	Not Detected
1,1-Dichloroethene	21	Not Detected	84	Not Detected
Acetone	85	250	200	600
2-Propanol	85	Not Detected	210	Not Detected
Carbon Disulfide	21	350	66	1100
3-Chloropropene	85	Not Detected	260	Not Detected
Methylene Chloride	21	Not Detected	74	Not Detected
Methyl tert-butyl ether	21	Not Detected	76	Not Detected
trans-1,2-Dichloroethene	21	Not Detected	84	Not Detected
Hexane	21	Not Detected	75	Not Detected
1,1-Dichloroethane	21	Not Detected	86	Not Detected
2-Butanone (Methyl Ethyl Ketone)	21	36	62	100
cis-1,2-Dichloroethene	21	Not Detected	84	Not Detected
Tetrahydrofuran	21	Not Detected	62	Not Detected
Chloroform	21	Not Detected	100	Not Detected
1,1,1-Trichloroethane	21	Not Detected	120	Not Detected
Cyclohexane	21	Not Detected	73	Not Detected
Carbon Tetrachloride	21	Not Detected	130	Not Detected
2,2,4-Trimethylpentane	21	Not Detected	99	Not Detected
Benzene	21	Not Detected	68	Not Detected
1,2-Dichloroethane	21	Not Detected	86	Not Detected
Heptane	21	23	87	94
Trichloroethene	21	Not Detected	110	Not Detected
1,2-Dichloropropane	21	Not Detected	98	Not Detected
1,4-Dioxane	85	Not Detected	300	Not Detected
Bromodichloromethane	21	Not Detected	140	Not Detected
cis-1,3-Dichloropropene	21	Not Detected	96	Not Detected
4-Methyl-2-pentanone	21	Not Detected	87	Not Detected
Toluene	21	33	80	120
trans-1,3-Dichloropropene	21	Not Detected	96	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP9-10 Irwindale CA

Lab ID#: 0912505-12A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122905**	**Date of Collection:**	**12/18/09 11:23:00 AM**
Dil. Factor:	**4.24**	**Date of Analysis:**	**12/29/09 12:43 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	21	Not Detected	120	Not Detected
Tetrachloroethene	21	Not Detected	140	Not Detected
2-Hexanone	85	Not Detected	350	Not Detected
Dibromochloromethane	21	Not Detected	180	Not Detected
1,2-Dibromoethane (EDB)	21	Not Detected	160	Not Detected
Chlorobenzene	21	Not Detected	98	Not Detected
Ethyl Benzene	21	Not Detected	92	Not Detected
m,p-Xylene	21	Not Detected	92	Not Detected
o-Xylene	21	Not Detected	92	Not Detected
Styrene	21	Not Detected	90	Not Detected
Bromoform	21	Not Detected	220	Not Detected
Cumene	21	Not Detected	100	Not Detected
1,1,2,2-Tetrachloroethane	21	Not Detected	140	Not Detected
Propylbenzene	21	Not Detected	100	Not Detected
4-Ethyltoluene	21	Not Detected	100	Not Detected
1,3,5-Trimethylbenzene	21	Not Detected	100	Not Detected
1,2,4-Trimethylbenzene	21	Not Detected	100	Not Detected
1,3-Dichlorobenzene	21	Not Detected	130	Not Detected
1,4-Dichlorobenzene	21	Not Detected	130	Not Detected
alpha-Chlorotoluene	21	Not Detected	110	Not Detected
1,2-Dichlorobenzene	21	Not Detected	130	Not Detected
1,2,4-Trichlorobenzene	85	Not Detected	630	Not Detected
Hexachlorobutadiene	85	Not Detected	900	Not Detected

J = Estimated value.

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	98	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP9-10 Irwindale CA Lab Duplicate

Lab ID#: 0912505-12AA

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122906**	**Date of Collection:**	**12/18/09 11:23:00 AM**
Dil. Factor:	**4.24**	**Date of Analysis:**	**12/29/09 01:05 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	21	Not Detected	100	Not Detected
Freon 114	21	Not Detected	150	Not Detected
Chloromethane	85	Not Detected	180	Not Detected
Vinyl Chloride	21	Not Detected	54	Not Detected
1,3-Butadiene	21	77	47	170
Bromomethane	21	Not Detected	82	Not Detected
Chloroethane	21	Not Detected	56	Not Detected
Freon 11	21	Not Detected	120	Not Detected
Ethanol	85	Not Detected	160	Not Detected
Freon 113	21	Not Detected	160	Not Detected
1,1-Dichloroethene	21	Not Detected	84	Not Detected
Acetone	85	200	200	480
2-Propanol	85	Not Detected	210	Not Detected
Carbon Disulfide	21	330	66	1000
3-Chloropropene	85	Not Detected	260	Not Detected
Methylene Chloride	21	Not Detected	74	Not Detected
Methyl tert-butyl ether	21	Not Detected	76	Not Detected
trans-1,2-Dichloroethene	21	Not Detected	84	Not Detected
Hexane	21	Not Detected	75	Not Detected
1,1-Dichloroethane	21	Not Detected	86	Not Detected
2-Butanone (Methyl Ethyl Ketone)	21	30	62	88
cis-1,2-Dichloroethene	21	Not Detected	84	Not Detected
Tetrahydrofuran	21	Not Detected	62	Not Detected
Chloroform	21	Not Detected	100	Not Detected
1,1,1-Trichloroethane	21	Not Detected	120	Not Detected
Cyclohexane	21	Not Detected	73	Not Detected
Carbon Tetrachloride	21	Not Detected	130	Not Detected
2,2,4-Trimethylpentane	21	Not Detected	99	Not Detected
Benzene	21	Not Detected	68	Not Detected
1,2-Dichloroethane	21	Not Detected	86	Not Detected
Heptane	21	Not Detected	87	Not Detected
Trichloroethene	21	Not Detected	110	Not Detected
1,2-Dichloropropane	21	Not Detected	98	Not Detected
1,4-Dioxane	85	Not Detected	300	Not Detected
Bromodichloromethane	21	Not Detected	140	Not Detected
cis-1,3-Dichloropropene	21	Not Detected	96	Not Detected
4-Methyl-2-pentanone	21	Not Detected	87	Not Detected
Toluene	21	32	80	120
trans-1,3-Dichloropropene	21	Not Detected	96	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: GP9-10 Irwindale CA Lab Duplicate

Lab ID#: 0912505-12AA

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122906**	**Date of Collection: 12/18/09 11:23:00 AM**	
Dil. Factor:	**4.24**	**Date of Analysis: 12/29/09 01:05 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	21	Not Detected	120	Not Detected
Tetrachloroethene	21	Not Detected	140	Not Detected
2-Hexanone	85	Not Detected	350	Not Detected
Dibromochloromethane	21	Not Detected	180	Not Detected
1,2-Dibromoethane (EDB)	21	Not Detected	160	Not Detected
Chlorobenzene	21	Not Detected	98	Not Detected
Ethyl Benzene	21	Not Detected	92	Not Detected
m,p-Xylene	21	Not Detected	92	Not Detected
o-Xylene	21	Not Detected	92	Not Detected
Styrene	21	Not Detected	90	Not Detected
Bromoform	21	Not Detected	220	Not Detected
Cumene	21	Not Detected	100	Not Detected
1,1,2,2-Tetrachloroethane	21	Not Detected	140	Not Detected
Propylbenzene	21	Not Detected	100	Not Detected
4-Ethyltoluene	21	Not Detected	100	Not Detected
1,3,5-Trimethylbenzene	21	Not Detected	100	Not Detected
1,2,4-Trimethylbenzene	21	Not Detected	100	Not Detected
1,3-Dichlorobenzene	21	Not Detected	130	Not Detected
1,4-Dichlorobenzene	21	Not Detected	130	Not Detected
alpha-Chlorotoluene	21	Not Detected	110	Not Detected
1,2-Dichlorobenzene	21	Not Detected	130	Not Detected
1,2,4-Trichlorobenzene	85	Not Detected	630	Not Detected
Hexachlorobutadiene	85	Not Detected	900	Not Detected

Container Type: PAC250 Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	100	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 0912505-13A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/26/09 08:54 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.0	Not Detected	25	Not Detected
Freon 114	5.0	Not Detected	35	Not Detected
Chloromethane	20	Not Detected	41	Not Detected
Vinyl Chloride	5.0	Not Detected	13	Not Detected
1,3-Butadiene	5.0	Not Detected	11	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	5.0	Not Detected	13	Not Detected
Freon 11	5.0	Not Detected	28	Not Detected
Ethanol	20	Not Detected	38	Not Detected
Freon 113	5.0	Not Detected	38	Not Detected
1,1-Dichloroethene	5.0	Not Detected	20	Not Detected
Acetone	20	Not Detected	48	Not Detected
2-Propanol	20	Not Detected	49	Not Detected
Carbon Disulfide	5.0	Not Detected	16	Not Detected
3-Chloropropene	20	Not Detected	63	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	5.0	Not Detected	18	Not Detected
trans-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Hexane	5.0	Not Detected	18	Not Detected
1,1-Dichloroethane	5.0	Not Detected	20	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.0	Not Detected	15	Not Detected
cis-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Tetrahydrofuran	5.0	Not Detected	15	Not Detected
Chloroform	5.0	Not Detected	24	Not Detected
1,1,1-Trichloroethane	5.0	Not Detected	27	Not Detected
Cyclohexane	5.0	Not Detected	17	Not Detected
Carbon Tetrachloride	5.0	Not Detected	31	Not Detected
2,2,4-Trimethylpentane	5.0	Not Detected	23	Not Detected
Benzene	5.0	Not Detected	16	Not Detected
1,2-Dichloroethane	5.0	Not Detected	20	Not Detected
Heptane	5.0	Not Detected	20	Not Detected
Trichloroethene	5.0	Not Detected	27	Not Detected
1,2-Dichloropropane	5.0	Not Detected	23	Not Detected
1,4-Dioxane	20	Not Detected	72	Not Detected
Bromodichloromethane	5.0	Not Detected	34	Not Detected
cis-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected
4-Methyl-2-pentanone	5.0	Not Detected	20	Not Detected
Toluene	5.0	Not Detected	19	Not Detected
trans-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 0912505-13A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/26/09 08:54 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	5.0	Not Detected	27	Not Detected
Tetrachloroethene	5.0	Not Detected	34	Not Detected
2-Hexanone	20	Not Detected	82	Not Detected
Dibromochloromethane	5.0	Not Detected	42	Not Detected
1,2-Dibromoethane (EDB)	5.0	Not Detected	38	Not Detected
Chlorobenzene	5.0	Not Detected	23	Not Detected
Ethyl Benzene	5.0	Not Detected	22	Not Detected
m,p-Xylene	5.0	Not Detected	22	Not Detected
o-Xylene	5.0	Not Detected	22	Not Detected
Styrene	5.0	Not Detected	21	Not Detected
Bromoform	5.0	Not Detected	52	Not Detected
Cumene	5.0	Not Detected	24	Not Detected
1,1,2,2-Tetrachloroethane	5.0	Not Detected	34	Not Detected
Propylbenzene	5.0	Not Detected	24	Not Detected
4-Ethyltoluene	5.0	Not Detected	24	Not Detected
1,3,5-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,2,4-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,3-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,4-Dichlorobenzene	5.0	Not Detected	30	Not Detected
alpha-Chlorotoluene	5.0	Not Detected	26	Not Detected
1,2-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,2,4-Trichlorobenzene	20	Not Detected	150	Not Detected
Hexachlorobutadiene	20	Not Detected	210	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	101	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 0912505-13B

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122904**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/29/09 12:21 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.0	Not Detected	25	Not Detected
Freon 114	5.0	Not Detected	35	Not Detected
Chloromethane	20	Not Detected	41	Not Detected
Vinyl Chloride	5.0	Not Detected	13	Not Detected
1,3-Butadiene	5.0	Not Detected	11	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	5.0	Not Detected	13	Not Detected
Freon 11	5.0	Not Detected	28	Not Detected
Ethanol	20	Not Detected	38	Not Detected
Freon 113	5.0	Not Detected	38	Not Detected
1,1-Dichloroethene	5.0	Not Detected	20	Not Detected
Acetone	20	Not Detected	48	Not Detected
2-Propanol	20	Not Detected	49	Not Detected
Carbon Disulfide	5.0	Not Detected	16	Not Detected
3-Chloropropene	20	Not Detected	63	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	5.0	Not Detected	18	Not Detected
trans-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Hexane	5.0	Not Detected	18	Not Detected
1,1-Dichloroethane	5.0	Not Detected	20	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.0	Not Detected	15	Not Detected
cis-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Tetrahydrofuran	5.0	Not Detected	15	Not Detected
Chloroform	5.0	Not Detected	24	Not Detected
1,1,1-Trichloroethane	5.0	Not Detected	27	Not Detected
Cyclohexane	5.0	Not Detected	17	Not Detected
Carbon Tetrachloride	5.0	Not Detected	31	Not Detected
2,2,4-Trimethylpentane	5.0	Not Detected	23	Not Detected
Benzene	5.0	Not Detected	16	Not Detected
1,2-Dichloroethane	5.0	Not Detected	20	Not Detected
Heptane	5.0	Not Detected	20	Not Detected
Trichloroethene	5.0	Not Detected	27	Not Detected
1,2-Dichloropropane	5.0	Not Detected	23	Not Detected
1,4-Dioxane	20	Not Detected	72	Not Detected
Bromodichloromethane	5.0	Not Detected	34	Not Detected
cis-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected
4-Methyl-2-pentanone	5.0	Not Detected	20	Not Detected
Toluene	5.0	Not Detected	19	Not Detected
trans-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 0912505-13B

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122904**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/29/09 12:21 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	5.0	Not Detected	27	Not Detected
Tetrachloroethene	5.0	Not Detected	34	Not Detected
2-Hexanone	20	Not Detected	82	Not Detected
Dibromochloromethane	5.0	Not Detected	42	Not Detected
1,2-Dibromoethane (EDB)	5.0	Not Detected	38	Not Detected
Chlorobenzene	5.0	Not Detected	23	Not Detected
Ethyl Benzene	5.0	Not Detected	22	Not Detected
m,p-Xylene	5.0	Not Detected	22	Not Detected
o-Xylene	5.0	Not Detected	22	Not Detected
Styrene	5.0	Not Detected	21	Not Detected
Bromoform	5.0	Not Detected	52	Not Detected
Cumene	5.0	Not Detected	24	Not Detected
1,1,2,2-Tetrachloroethane	5.0	Not Detected	34	Not Detected
Propylbenzene	5.0	Not Detected	24	Not Detected
4-Ethyltoluene	5.0	Not Detected	24	Not Detected
1,3,5-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,2,4-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,3-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,4-Dichlorobenzene	5.0	Not Detected	30	Not Detected
alpha-Chlorotoluene	5.0	Not Detected	26	Not Detected
1,2-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,2,4-Trichlorobenzene	20	Not Detected	150	Not Detected
Hexachlorobutadiene	20	Not Detected	210	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	100	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 0912505-14A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/26/09 08:07 AM**	

Compound	%Recovery
Freon 12	92
Freon 114	94
Chloromethane	78
Vinyl Chloride	93
1,3-Butadiene	95
Bromomethane	98
Chloroethane	93
Freon 11	94
Ethanol	94
Freon 113	96
1,1-Dichloroethene	92
Acetone	93
2-Propanol	82
Carbon Disulfide	94
3-Chloropropene	92
Methylene Chloride	88
Methyl tert-butyl ether	111
trans-1,2-Dichloroethene	95
Hexane	95
1,1-Dichloroethane	91
2-Butanone (Methyl Ethyl Ketone)	94
cis-1,2-Dichloroethene	91
Tetrahydrofuran	89
Chloroform	91
1,1,1-Trichloroethane	88
Cyclohexane	93
Carbon Tetrachloride	91
2,2,4-Trimethylpentane	93
Benzene	90
1,2-Dichloroethane	89
Heptane	94
Trichloroethene	89
1,2-Dichloropropane	89
1,4-Dioxane	90
Bromodichloromethane	89
cis-1,3-Dichloropropene	93
4-Methyl-2-pentanone	94
Toluene	88
trans-1,3-Dichloropropene	88

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 0912505-14A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/26/09 08:07 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	90
Tetrachloroethene	88
2-Hexanone	90
Dibromochloromethane	90
1,2-Dibromoethane (EDB)	89
Chlorobenzene	88
Ethyl Benzene	89
m,p-Xylene	90
o-Xylene	90
Styrene	95
Bromoform	93
Cumene	96
1,1,2,2-Tetrachloroethane	88
Propylbenzene	93
4-Ethyltoluene	96
1,3,5-Trimethylbenzene	86
1,2,4-Trimethylbenzene	93
1,3-Dichlorobenzene	88
1,4-Dichlorobenzene	90
alpha-Chlorotoluene	99
1,2-Dichlorobenzene	88
1,2,4-Trichlorobenzene	92
Hexachlorobutadiene	91

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	103	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 0912505-14B

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122902**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/29/09 11:30 AM**	

Compound	%Recovery
Freon 12	89
Freon 114	90
Chloromethane	86
Vinyl Chloride	92
1,3-Butadiene	97
Bromomethane	96
Chloroethane	92
Freon 11	93
Ethanol	92
Freon 113	93
1,1-Dichloroethene	91
Acetone	94
2-Propanol	82
Carbon Disulfide	93
3-Chloropropene	94
Methylene Chloride	89
Methyl tert-butyl ether	100
trans-1,2-Dichloroethene	93
Hexane	92
1,1-Dichloroethane	91
2-Butanone (Methyl Ethyl Ketone)	96
cis-1,2-Dichloroethene	91
Tetrahydrofuran	88
Chloroform	91
1,1,1-Trichloroethane	87
Cyclohexane	94
Carbon Tetrachloride	91
2,2,4-Trimethylpentane	94
Benzene	89
1,2-Dichloroethane	88
Heptane	94
Trichloroethene	87
1,2-Dichloropropane	88
1,4-Dioxane	92
Bromodichloromethane	87
cis-1,3-Dichloropropene	89
4-Methyl-2-pentanone	94
Toluene	87
trans-1,3-Dichloropropene	88

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 0912505-14B

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122902**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/29/09 11:30 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	89
Tetrachloroethene	88
2-Hexanone	90
Dibromochloromethane	89
1,2-Dibromoethane (EDB)	91
Chlorobenzene	87
Ethyl Benzene	90
m,p-Xylene	91
o-Xylene	91
Styrene	95
Bromoform	90
Cumene	97
1,1,2,2-Tetrachloroethane	89
Propylbenzene	92
4-Ethyltoluene	96
1,3,5-Trimethylbenzene	87
1,2,4-Trimethylbenzene	94
1,3-Dichlorobenzene	88
1,4-Dichlorobenzene	90
alpha-Chlorotoluene	96
1,2-Dichlorobenzene	89
1,2,4-Trichlorobenzene	91
Hexachlorobutadiene	92

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	103	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 0912505-15A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/26/09 08:32 AM**	

Compound	%Recovery
Freon 12	98
Freon 114	101
Chloromethane	92
Vinyl Chloride	102
1,3-Butadiene	107
Bromomethane	103
Chloroethane	105
Freon 11	102
Ethanol	171 Q
Freon 113	92
1,1-Dichloroethene	90
Acetone	98
2-Propanol	85
Carbon Disulfide	100
3-Chloropropene	97
Methylene Chloride	88
Methyl tert-butyl ether	107
trans-1,2-Dichloroethene	100
Hexane	101
1,1-Dichloroethane	94
2-Butanone (Methyl Ethyl Ketone)	102
cis-1,2-Dichloroethene	101
Tetrahydrofuran	97
Chloroform	94
1,1,1-Trichloroethane	93
Cyclohexane	100
Carbon Tetrachloride	97
2,2,4-Trimethylpentane	100
Benzene	97
1,2-Dichloroethane	95
Heptane	100
Trichloroethene	96
1,2-Dichloropropane	99
1,4-Dioxane	100
Bromodichloromethane	95
cis-1,3-Dichloropropene	103
4-Methyl-2-pentanone	104
Toluene	91
trans-1,3-Dichloropropene	96

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 0912505-15A

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/26/09 08:32 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	96
Tetrachloroethene	95
2-Hexanone	100
Dibromochloromethane	100
1,2-Dibromoethane (EDB)	102
Chlorobenzene	96
Ethyl Benzene	100
m,p-Xylene	101
o-Xylene	99
Styrene	103
Bromoform	100
Cumene	102
1,1,2,2-Tetrachloroethane	99
Propylbenzene	99
4-Ethyltoluene	104
1,3,5-Trimethylbenzene	94
1,2,4-Trimethylbenzene	104
1,3-Dichlorobenzene	96
1,4-Dichlorobenzene	100
alpha-Chlorotoluene	106
1,2-Dichlorobenzene	100
1,2,4-Trichlorobenzene	104
Hexachlorobutadiene	100

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	95	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	106	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 0912505-15B

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122903**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/29/09 11:57 AM**	

Compound	%Recovery
Freon 12	97
Freon 114	99
Chloromethane	89
Vinyl Chloride	99
1,3-Butadiene	108
Bromomethane	103
Chloroethane	101
Freon 11	98
Ethanol	169 Q
Freon 113	88
1,1-Dichloroethene	87
Acetone	95
2-Propanol	84
Carbon Disulfide	97
3-Chloropropene	94
Methylene Chloride	86
Methyl tert-butyl ether	105
trans-1,2-Dichloroethene	97
Hexane	98
1,1-Dichloroethane	92
2-Butanone (Methyl Ethyl Ketone)	99
cis-1,2-Dichloroethene	100
Tetrahydrofuran	93
Chloroform	94
1,1,1-Trichloroethane	91
Cyclohexane	98
Carbon Tetrachloride	94
2,2,4-Trimethylpentane	97
Benzene	96
1,2-Dichloroethane	93
Heptane	101
Trichloroethene	95
1,2-Dichloropropane	97
1,4-Dioxane	100
Bromodichloromethane	95
cis-1,3-Dichloropropene	101
4-Methyl-2-pentanone	101
Toluene	90
trans-1,3-Dichloropropene	99

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 0912505-15B

MODIFIED EPA METHOD TO-15 GC/MS

File Name:	**w122903**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/29/09 11:57 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	99
Tetrachloroethene	96
2-Hexanone	102
Dibromochloromethane	98
1,2-Dibromoethane (EDB)	104
Chlorobenzene	97
Ethyl Benzene	99
m,p-Xylene	101
o-Xylene	102
Styrene	105
Bromoform	101
Cumene	104
1,1,2,2-Tetrachloroethane	99
Propylbenzene	99
4-Ethyltoluene	105
1,3,5-Trimethylbenzene	97
1,2,4-Trimethylbenzene	104
1,3-Dichlorobenzene	98
1,4-Dichlorobenzene	102
alpha-Chlorotoluene	107
1,2-Dichlorobenzene	102
1,2,4-Trichlorobenzene	107
Hexachlorobutadiene	105

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	105	70-130

Air Toxics LTD.

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager William Ragsdale

Collected by: (Print and Sign) William Ragsdale

Company Converse Consultants Email wragsdale@converseconsultants.com

Address 1055 E. Parkview Ave. City Corona State CA Zip 92626

Phone 714-444-9660 Fax 714-444-9620

Project Info:
P.O. # 09-42-1382
Project # 09-42-138-0L
Project Name 17 Auto Ctr

Turn Around Time:
☒ Normal
☐ Rush
_____ specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	GP1-5 Irwindale CA	6358	12/18/09	7:07	TO15	-29	0		
02A	GP3-5	2979		7:27		-27	0		
03A	GP3-10	2959		7:20		-30	0		
04A	GP6-5	3154		8:00		-30	0		
05A	GP6-10	3385		7:58		-28	0		
06A	GP7-5	2840		7:32		-27	0		
07A	GP7-10	2907		7:21		-28	0		
08A	GP8-5	2952		7:41		-27	0		
09A	GP8-10	2597		7:42		-28	0		
10A	GP10-5	2898		7:44		-30	0		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
	12/18/09	Monica Gallegos ATL	12/21/09 830
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinqu shed by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:
Rec'd
Return 1 Summa canister (~~not used~~).

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	OnTAC		NA	Good	Yes No None	0912505

Form 1238 rev.1

Air Toxics LTD.

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager William Rayshore

Collected by: (Print and Sign) William Rayshore

Company _____ Email Pabc1

Address Somerset Ave State ___ Zip ___

Phone _____ Fax _____

Project Info:
P.O. # 09-42-1378-01
Project # 09-42-1378-01
Project Name 17 Acre Lot

Turn Around Time:
☐ Normal
☐ Rush
_____ specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psig)
01A	6P10-10 Irwindale, CA	6356	12/8/09	7:51	TO15	-30	6		
02A	6P9-10 ↓	2596	↓	11:23	↓	-30	6		

Relinquished by: (signature) Date/Time: 12/8/09
Received by: (signature) Date/Time: Monica Gregson AIR 12/8/09 830

Relinquished by: (signature) Date/Time
Received by: (signature) Date/Time

Relinquished by: (signature) Date/Time
Received by: (signature) Date/Time

Notes:
6P9-10 Strong odor no soil sample

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	Fed Ex		NA	Good	Yes No (None)	0912505

Form 1259 rev.11

Boring Logs

Appendix B

Log of Boring No. GP1

Dates Drilled: 12/17/2009 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY SAND (SM): fine to medium-grained, moderately sorted, slightly moist.	X		0.0			
5			X		0.0			
		SANDY GRAVEL (GW): tan, gravel and cobbles with fine to coarse sand, dry.						
10			X		0.0			
15			X		0.0			
		End of boring at 15 feet. Hole collapse at 5 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP1**

Log of Boring No. GP10

Dates Drilled: 12/17/2010 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY CLAY (SM): very fine-grianed with trace gravel, moderately sorted, slightly moist.	X		0.0			
5			X		0.0			
		SAND (SP): slightly moist, very weill sorted.						
10			X		0.0			
		GRAVELLY SAND (SW): trace, very fine to coarse with gravel and cobbles, poorly sorted, dry.						
15			X		0.0			
		End of boring at 15 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP9**

Log of Boring No. GP2

Dates Drilled: 12/18/2009 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SANDY GRAVEL (GW): light tan, crushed granite cobble and gravel with fine to medium grained sand, poorly sorted, dry.	X		0.0			
5			X		0.0			
		SAND (SP): with gravel, brown, slightly moist, very fine to coarse grained sand with gravel, poorly sorted.						
10			X		0.0			
15			X		0.0			
		End of boring at 15 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP2**

Log of Boring No. GP3

Dates Drilled: 12/18/2009 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY SAND (SM): brown, very fine grained with minor coarse sand, moderately sorted, slightly moist.	X		0.0			
			X		0.0			
5		**SAND (SP):** light brown, very fine to fine grained, well sorted, slightly moist.						
		-gray, slightly coarser grained, moderately sorted	X		0.0			
10								
		SANDY GRAVEL (GW): tan, gravel and cobble with fine to coarse grained sand, poorly sorted, dry.	X		0.0			
15		End of boring at 15 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP3**

Log of Boring No. GP4

Dates Drilled: 12/18/2009 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY SAND (SM): brown, very fine grained, moderately sorted, sllightly moist.	X		0.0			
			X		0.0			
5		**SANDY GRAVEL (GW):** tan, gravel and cobbles with fine to coarse grained sand, poorly sorted, dry.						
10		-dry	X		0.0			
		Refusal at 12 feet. End of boring at 12 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP4**

Log of Boring No. GP5

Dates Drilled: 12/18/2009 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY SAND (SM): brown, very fine grained, moderately sorted, slightly moist.	X		0.0			
5			X		0.0			
			X		0.0			
10		**GRAVELLY SAND (SW):** tan, very fine to coarse sand with gravel, poorly sorted, dry.						
		SANDY GRAVEL (GW): tan, fine to coarse with sand with gravel and cobbles, poorly sorted, dry.	X		0.0			
15		End of boring at 15 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP5**

Log of Boring No. GP6

Dates Drilled: 12/17/2009 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY SAND (SM): brown, slightly moist, very fine grained sand with minor gravels.	X		0.0			
5			X		0.0			
		SAND (SP): brown, very fine to fine grained, well sorted, slightly moist.						
10			X		0.0			
		GRAVELLY SAND (SW): brown, very fine to coarse sand with gravel, very poorly sorted, slightly moist.						
15		-increased gravel and cobbles, dry	X		0.0			
		End of boring at 15 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP6**

Log of Boring No. GP7

Dates Drilled: 12/17/2009 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY SAND (SM): very fine to medium grained with minor clay and trace gravel, poorly sorted, slightly moist.	X		0.0			
5			X		0.0			
10			X		0.0			
		SAND (SP): tan, fine to medium grained, moderately sorted, dry.						
15		-cobble and rock, gray, dry	X		0.0			
		End of boring at 15 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP7**

Log of Boring No. GP8

Dates Drilled: 12/17/2009 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		GRAVELLY SAND (SW): fine to coarse-grained with gravel, poorly sorted, dry.	X		0.0			
5			X		0.0			
10		-increased gravel and cobbles	X		0.0			
15			X		0.0			
		End of boring at 15 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP8**

Log of Boring No. GP9

Dates Drilled: 12/18/2009 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		GRAVELLY SAND (SW): gray, very fine to coarse grained with cobbles and gravel, poorly sorted, dry.	X		15.8			
			X		54.2			
5		**SAND (SP):** dark gray, medium grained, slightly moist, well sorted, strong odor, possibly fill.						
			X		54.6			
10		**GRAVELLY SAND (SW):** gray, very fine to coarse with gravel and cobbles, slight odor.						
		-slight odor	X		20.8			
15		End of boring at 15 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP9**

Log of Boring No. GP8A

Dates Drilled: 2/15/2010 Logged by: MVF Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY SAND (SM): brown, very fine to fine grained, moderately sorted, slightly moist.	X					
5		**SAND (SP):** brown, fine to medium grained, well sorted, trace gravel, slighlty moist.	X					
10		**GRAVELLY SAND (SW):** brown, fine to coarse grained sand with gravel, poorly sorted, slighlty moist.	X					
15			X					
20		End of boring at 20 feet. Soil vapor probes at 5, 10, and 20 feet bgs.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP8A**

Log of Boring No. GP8B

Dates Drilled: 2/15/2010 Logged by: MVF Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY SAND (SM): brown, very fine to fine grained, moderately sorted, slightly moist.	X					
5		**SAND (SP):** brown, fine to medium grained, well sorted, trace gravel, slighlty moist.	X					
10		**GRAVELLY SAND (SW):** brown, fine to coarse grained sand with gravel, poorly sorted, slighlty moist.	X					
15			X					
20		End of boring at 20 feet. Soil vapor probes at 5, 10, and 20 feet bgs.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP8B**

Log of Boring No. GP-8C

Dates Drilled: 2/15/2010 Logged by: MVF Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
0		**GRAVELLY SAND (SW):** brown, fine to coarse grained sand with gravel, poorly sorted, slightly moist.	X					
5			X					
10			X					
15			X					
20		End of boring at 20 feet. Sample liner melted at 20 feet. Sample had to be transfered to new liner. Soil vapor probes at 5, 10, and 20 feet bgs.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP8C**

Log of Boring No. GP9A

Dates Drilled: 2/4/2010 Logged by: MVF Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SILTY SAND (SM): brown, very fine to medium grained with trace gravel, moderately sorted, dry.	X					
5		**SAND (SP):** dark gray, very fine to fine grained, well sorted, slightly moist, possibly fill material.	X					
10		**GRAVELLY SAND (SW):** gray, very fine to coarse grained sand, gravel and cobbles, poorly sorted, dry.	X					
15			X					
20		End of boring at 20 feet. Soil vapor probes at 5, 10, and 20 feet bgs.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP9A**

Log of Boring No. GP9B

Dates Drilled: 2/4/2010 Logged by: MVF Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		GRAVELLY SAND (SW): gray, very fine to coarse grained sand with gravel, poorly sorted.	X					
5		**SAND (SP):** dark gray, very fine to fine grained, well sorted, sligIty moist, possibly fill material.	X					
10		**GRAVELLY SAND (SW):** gray, very fine to coarse grained sand with gravel, poorly sorted.	X					
15			X					
		End of boring at 17 feet. Soil vapor probes at 5, 10, and 17 feet bgs.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP9B**

Log of Boring No. GP9C

Dates Drilled: 2/15/2010 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		GRAVELLY SAND (SW): gray, fine to coarse grained sand with gravel, poorly sorted, slightly moist.	X					
5		-dark gray, slight odor (possibly a solvent)	X					
10		-Refusal due to gravel at 10 feet in initial boring. Remainder of boring logged from samples from co-located boring **SAND (SP):** dark gray, fine grained, well sorted, slightly moist, possibly fill material, slight odor.	X					
15		**GRAVELLY SAND (SW):** brown, very fine to medium grained sand with gravel, poorly sorted slightly moist, no odor.	X					
20		End of boring at 20 feet. Soil vapor probes at 5 and 10 feet bgs.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP9C**

Log of Boring No. GP9D

Dates Drilled: 2/15/2010 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
5		**GRAVELLY SAND (SW):** gray, fine to coarse grained sand with gravel and cobbles, poorly sorted, slightly moist.	X					
10			X					
15			X					
		End of boring at 16.5 feet. Soil vapor probes at 5, 10, and 15 feet bgs.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP9D**

Log of Boring No. GP9E

Dates Drilled: 2/14/2010 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		GRAVELLY SAND (SW): tan, fine to coarse grained sand with gravel, poorly sorted, slightly moist.	X					
5		**SAND (SP):** brown, very fine to fine grained, trace gravel, well sorted, slightly moist.	X					
10		**GRAVELLY SAND (SW):** tan, fine to coarse grained sand with gravel, poorly sorted, slightly moist.	X					
15		End of boring at 15 feet. Soil vapor probes at 5, 10, and 15 feet bgs.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP9E**

Log of Boring No. GP9F

Dates Drilled: 2/14/2010 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		GRAVELLY SAND (SW): tan, fine to coarse grained sand with gravel, poorly sorted, slightly moist.	X		0.0			
			X		0.0			
5		**SAND (SP):** brown, very fine to fine grained, trace gravel, well sorted, slightly moist.						
			X		0.0			
10		**GRAVELLY SAND (SW):** tan, fine to coarse grained sand with gravel, poorly sorted, slightly moist.						
			X		0.0			
15		End of boring at 18 feet. Soil vapor probes at 5, 10, and 18 feet bgs.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP9F**

Log of Boring No. GP9G

Dates Drilled: 2/15/2010 Logged by: WLR Checked By: MVF, PG

Equipment: GEOPROBE Driving Weight and Drop: N/A

Ground Surface Elevation (ft): N/A Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	PID (ppm)	MOISTURE (%)	DRY UNIT WT. (pcf)	MUNSELL COLOR
		SAND (SW): brown, very fine to medium grained sand with gravel, poorly sorted, slightly moist.	X					
5			X					
		-significant cobble or boulder						
10			X					
15			X					
20			X					
		End of boring at 20 feet.						

Converse Consultants

Project Name
CITY OF IRWINDALE
LIVE OAK AVENUE
IRWINDALE, CALIFORNIA

Project No. **09-42-138-02**

Drawing No. **GP9G**

Asbestos Analytical Report & Chain of Custody Documentation

Appendix C

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

POLARIZED LIGHT MICROSCOPY ANALYSIS REPORT

Client: CONVERSE CONSULTANTS
185 E. PAULARINO AVENUE, SUITE B
COSTA MESA, CALIFORNIA 92626
Account: N/A
Contact: LAURA TANAKA
Project No.: 09-42-138-02

Date Received: 12/18/09
Date Analyzed: 12/18/09
Date Reported: 12/18/09
Reported To: LAURA TANAKA
Submitted By: DELIVERY SERVICE
Report No.: 71-179419
P. O. #: N/A

CITY OF IRWINDALE

I certify that these results are accurate for the samples obtained and comply with accepted methods of analysis.

Lab Manager, Dan R. Dolk

Analyst, Dan R. Dolk

RESULTS: LAB SAMPLE # LAB DESCRIPTION LOCATION	CLIENT SAMPLE #	PERCENT & TYPE OF ASBESTOS	PERCENT & TYPE OF NON-ASBESTOS	LAYER I-H APPEARANCE F-NF
179419A Black Mastic Debris Pile	01-A	None Detected	<1% Cellulose <1% Glass Fibers 95% Organic Binders 5% Mineral Cleavages	I F
179419B Black Mastic Debris Pile	01-B	None Detected	95% Organic Binders 5% Mineral Cleavages	I NF
179419C Black Mastic Debris Pile	01-C	None Detected	5% Glass Fibers 85% Organic Binders 10% Mineral Cleavages	I F
179419D Black Felt Debris Pile	01-D	None Detected	30% Glass Fibers 50% Organic Binders 20% Mineral Cleavages	I F
179420A Black Felt Debris Pile	02-A	None Detected	40% Glass Fibers 40% Organic Binders 20% Mineral Cleavages	I F
179420B Black Mastic Debris Pile	02-B	None Detected	5% Glass Fibers 70% Organic Binders 25% Mineral Cleavages	I F
179421A Black Roofing Debris Pile	03-A	None Detected	25% Glass Fibers 45% Organic Binders 30% Mineral Cleavages	I F

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Telephone (916) 331-5444 ◆ Fax (916) 331-6444

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RESULTS: LAB SAMPLE # LAB DESCRIPTION LOCATION	CLIENT SAMPLE #	PERCENT & TYPE OF ASBESTOS	PERCENT & TYPE OF NON-ASBESTOS	LAYER I-H APPEARANCE F-NF
179421B Black Roofing Debris Pile	03-B	None Detected	40% Glass Fibers 40% Organic Binders 20% Mineral Cleavages	I F
179421C Black Roofing Debris Pile	03-C	None Detected	40% Glass Fibers 30% Organic Binders 30% Mineral Cleavages	I F
179421D Black Roofing Debris Pile	03-D	None Detected	5% Glass Fibers 75% Organic Binders 20% Mineral Cleavages	I F
179421E Black Roofing Debris Pile	03-E	None Detected	5% Cellulose 85% Organic Binders 10% Mineral Cleavages	I F
179422A Black Roofing Debris Pile	04-A	None Detected	30% Glass Fibers 40% Organic Binders 30% Mineral Cleavages	I F
179422B Black Roofing Debris Pile	04-B	None Detected	5% Cellulose 50% Organic Binders 45% Mineral Cleavages	I F
179423 Black Roofing Debris Pile	05	None Detected	<1% Cellulose 50% Organic Binders 50% Mineral Cleavages	I F
179424 Black Roofing Debris Pile	06	None Detected	5% Cellulose 40% Organic Binders 55% Mineral Cleavages	I F
179425 Black Roofing Debris Pile	07	None Detected	20% Glass Fibers 25% Organic Binders 30% Aggregate 25% Mineral Cleavages	I F
179426A Black Roofing Debris Pile	08-A	None Detected	25% Glass Fibers 30% Organic Binders 25% Aggregate 20% Mineral Cleavages	I F
179426B Black Mastic Debris Pile	08-B	None Detected	<1% Cellulose 30% Glass Fibers 50% Organic Binders 20% Mineral Cleavages	I F
179427 Black Roofing Debris Pile	09	None Detected	20% Glass Fibers 20% Organic Binders 30% Aggregate 25% Mineral Cleavages	I F
179428A White Pool Plaster Debris Pile	10-A	None Detected	<1% Cellulose 90% Carbonate Binders 10% Mineral Cleavages	I F

179428B Light Grey Cementitious Debris Pile	10-B	None Detected	<1% Cellulose 50% Sulfate Binders 20% Aggregate 30% Mineral Cleavages	I F
179429 White Pool Plaster Debris Pile	11	None Detected	85% Carbonate Binders 15% Mineral Cleavages	I NF
179430 White Pool Plaster Debris Pile	12	None Detected	85% Carbonate Binders 15% Mineral Cleavages	I NF

Attached are the results of analysis of bulk samples submitted for asbestos identification. Converse Consultants follows EPA Method EPA/600/R-93/116; July 1993.

Each sample was initially examined under a stereoscopic microscopic at a magnification of 10x to 60x. Fibrous material was examined for morphology and content. Portions of each sample were immersed in a fluid with a known refractive index. The sample was examined under polarized light using a Nikon Labophot microscope with a McCrone Dispersion Staining objective under 100X magnification. Optical characteristics of the fibrous material were examined to determine the mineralogy of the fiber. The observed optical characteristics include angles of extinction, signs of elongation and dispersion staining colors. Asbestos fiber content is estimated by optically comparing the quantity of asbestos material and non-asbestos material to establish estimated percentages. Per the method, samples with distinct layers or inhomogenous character have each layer analyzed separately and reported as individual layers. (I – Inhomogeneous, H – Homogeneous, F – Fibrous, NF – Non-Fibrous)

Bulk sampling may not have been performed by Converse Consultants personnel. No warranty is made as to the acceptability of sampling strategies.

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185 East Paularino Avenue
Suite B
Costa Mesa, CA 92626-3500
Tel.: (714) 444-9660
Fax: (714)444-9640

Converse Consultants

BULK SAMPLE LOG

Project Name: City of Irwindale Collected By: LAT

Project No.: 09-42-138-02 Date: 12-17-09

HOMOGENEOUS MATERIAL: Roofing felt - lg. rocks

Sample Number	Location	Area Sq. Ft.	Condition
01	Debris pile 179419		Damag.
02	↓ 179420		
03	↓ 179421		

Friability: Friable / Non-Friable
Potential for Contact with Material: High / Moderate
Influence of Vibration: High / Moderate
Potential for Air Erosion: High / Low
Damage Assessment: Good / Damaged / Significantly Damaged

COMMENTS:

Debris pile = 4' height x 8' long x 4' wide
- roofing materials
- stucco
- brick & stucco / pile

small portion of debris

CHAIN OF CUSTODY

Relinquished By: L Durable Time: 12:40 Date: 12-17-09
Received By: _____ Time: _____ Date: _____
Relinquished By: _____ Time: _____ Date: _____
Received By: _____ Time: _____ Date: _____

12/18/09

185 East Paularino Avenue
Suite B
Costa Mesa, CA 92626-3500
Tel.: (714) 444-9660
Fax: (714)444-9640

Converse Consultants

BULK SAMPLE LOG

Project Name: City of Irwindale Collected By: LAT

Project No.: 09-42-138-02 Date: 12-17-09

HOMOGENEOUS MATERIAL: Roofing felt - "sand" type

Sample Number	Location	Area Sq. Ft.	Condition
04	Demo pile 179422		Damag.
05	〃 179423		〃
06	〃 179424		〃

Friability:	Friable	(Non-Friable)	
Potential for Contact with Material:	(High)	Moderate	Low
Influence of Vibration:	(High)	Moderate	Low
Potential for Air Erosion:	(High)	Moderate	Low
Damage Assessment:	Good	Damaged	(Significantly Damaged)

COMMENTS:

CHAIN OF CUSTODY

Relinquished By: L Barnhart	Time: 12:40	Date: 12-17-09
Received By:	Time:	Date:
Relinquished By:	Time:	Date:
Received By:	Time:	Date:

12/18/09

185 East Paularino Avenue
Suite B
Costa Mesa, CA 92626-3500
Tel.: (714) 444-9660
Fax: (714)444-9640

Converse Consultants

BULK SAMPLE LOG

Project Name: City of Irwindale Collected By: LAT

Project No.: 09-42-138-02 Date: 12-17-09

HOMOGENEOUS MATERIAL: Roof felt - small nodes

Sample Number	Location	Area Sq. Ft.	Condition
07	Debris pile 179425		Damage
08	" 179426		"
09	" 179427		"

Friability:	Friable	~~Non-Friable~~	
Potential for Contact with Material:	High	Moderate	Low
Influence of Vibration:	High	Moderate	Low
Potential for Air Erosion:	High	Moderate	Low
Damage Assessment:	Good	Damaged	Significantly Damaged

COMMENTS:

✓ typical roof felt material

CHAIN OF CUSTODY

Relinquished By: [signature] Time: 12:40 Date: 12-17-09

Received By: _____ Time: _____ Date: _____

Relinquished By: _____ Time: _____ Date: _____

Received By: _____ Time: _____ Date: _____

12/18/09

185 East Paularino Avenue
Suite B
Costa Mesa, CA 92626-3500
Tel.: (714) 444-9660
Fax: (714)444-9640

Converse Consultants

BULK SAMPLE LOG

Project Name: City of Irwindale Collected By: LAT

Project No.: 09-42-138-02 Date: 12-17-09

HOMOGENEOUS MATERIAL: Stucco.

Sample Number	Location	Area Sq. Ft.	Condition
10	Debris pile 179428		Dam.
11	" 179429		"
12	" 179430		"

Friability:	Friable	(Non-Friable)	
Potential for Contact with Material:	(High)	Moderate	Low
Influence of Vibration:	(High)	Moderate	Low
Potential for Air Erosion:	(High)	Moderate	Low
Damage Assessment:	Good	Damaged	(Significantly Damaged)

COMMENTS: white

CHAIN OF CUSTODY

Relinquished By: [signature] Time: 12:40 Date: 12-17-09
Received By: _____ Time: _____ Date: _____
Relinquished By: _____ Time: _____ Date: _____
Received By: _____ Time: _____ Date: _____

12/18/09

Appendix G
Traffic Impact Assessment

Athens-Irwindale Materials Recovery Facility and Transfer Station Traffic Impact Analysis

City of Irwindale, California

August 29, 2013
Revised February 27, 2014

Athens-Irwindale Materials Recovery Facility and Transfer Station

TRAFFIC IMPACT ANALYSIS
CITY OF IRWINDALE, CALIFORNIA

PREPARED FOR:

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REVISED: FEBRUARY 27, 2014
AUGUST 29, 2013

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ES EXECUTIVE SUMMARY

The purpose of this traffic impact analysis is to evaluate the proposed materials recovery and transfer station from a traffic circulation standpoint. The proposed project is located east of the I-605 Freeway, on the northwesterly quadrant of Arrow Highway and Live Oak Avenue in the City of Irwindale.

Exhibit ES-A illustrates the general vicinity of the project site. As shown on Exhibit ES-A, the proposed project is located east of the I-605 Freeway in the City of Irwindale. The proposed project consists of three (3) primary areas: 1.) Materials Recovery Facility and Transfer Station, 2.) Convenience Store / Fueling Facility and 3.) Administrative/Visitor Center and Maintenance Building. The Materials and Recovery Facility and Transfer Station would include the majority of the building development totaling approximately 228,432 square feet. The Convenience Store / Fueling Facility would be a separate structure located on the north-east portion of the project site totaling approximately 2,390 square feet. The Administrative/Visitor Center and Maintenance Building is approximately 15,200 square feet. The project is estimated to be constructed and become operational in 2016. The project is expected to process approximately 6,000 tons of material per day with up to 345 employees.

Exhibit ES-B illustrates the intersection analysis locations which include the proposed site access driveways, adjacent roadways, and intersections around the site, including the major signalized intersections providing access from the site to the nearest regional corridor (I-605 Freeway). The intersection analysis locations have been selected based on locations where the project is anticipated to contribute 50 (or more) peak hour trips. The intersection analysis locations have also been refined based on the traffic study scoping presented in Appendix "A" and discussions with City staff. The San Gabriel Freeway (I-605) and the Foothill Freeway (I-210) ramps located in the City of Irwindale are the only Los Angeles County Congestion Management (CMP) - designated facilities in the City of Irwindale. Table ES-1 summarizes the intersection analysis locations identified on Exhibit ES-B:

EXHIBIT ES-A

VICINITY MAP

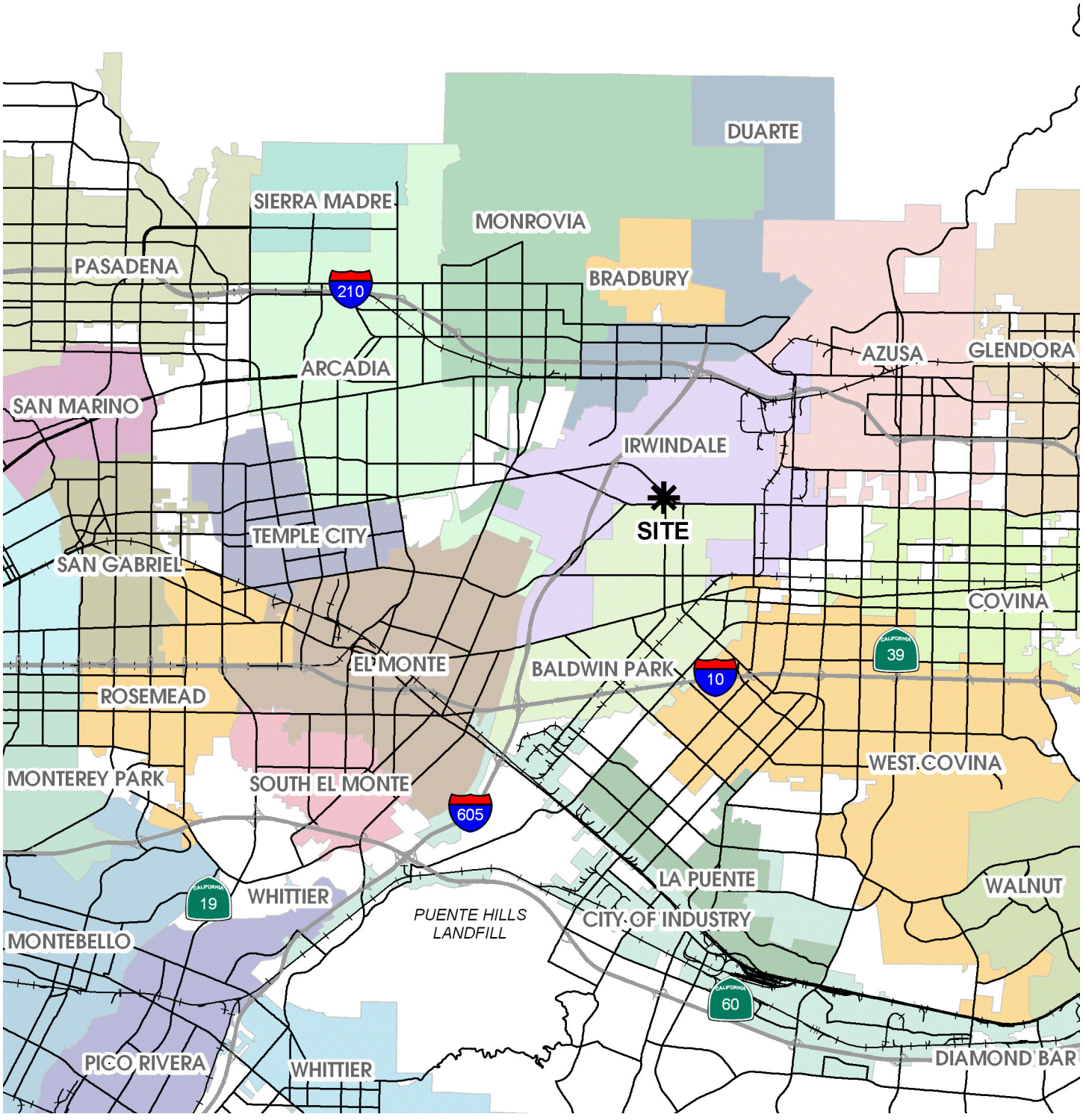
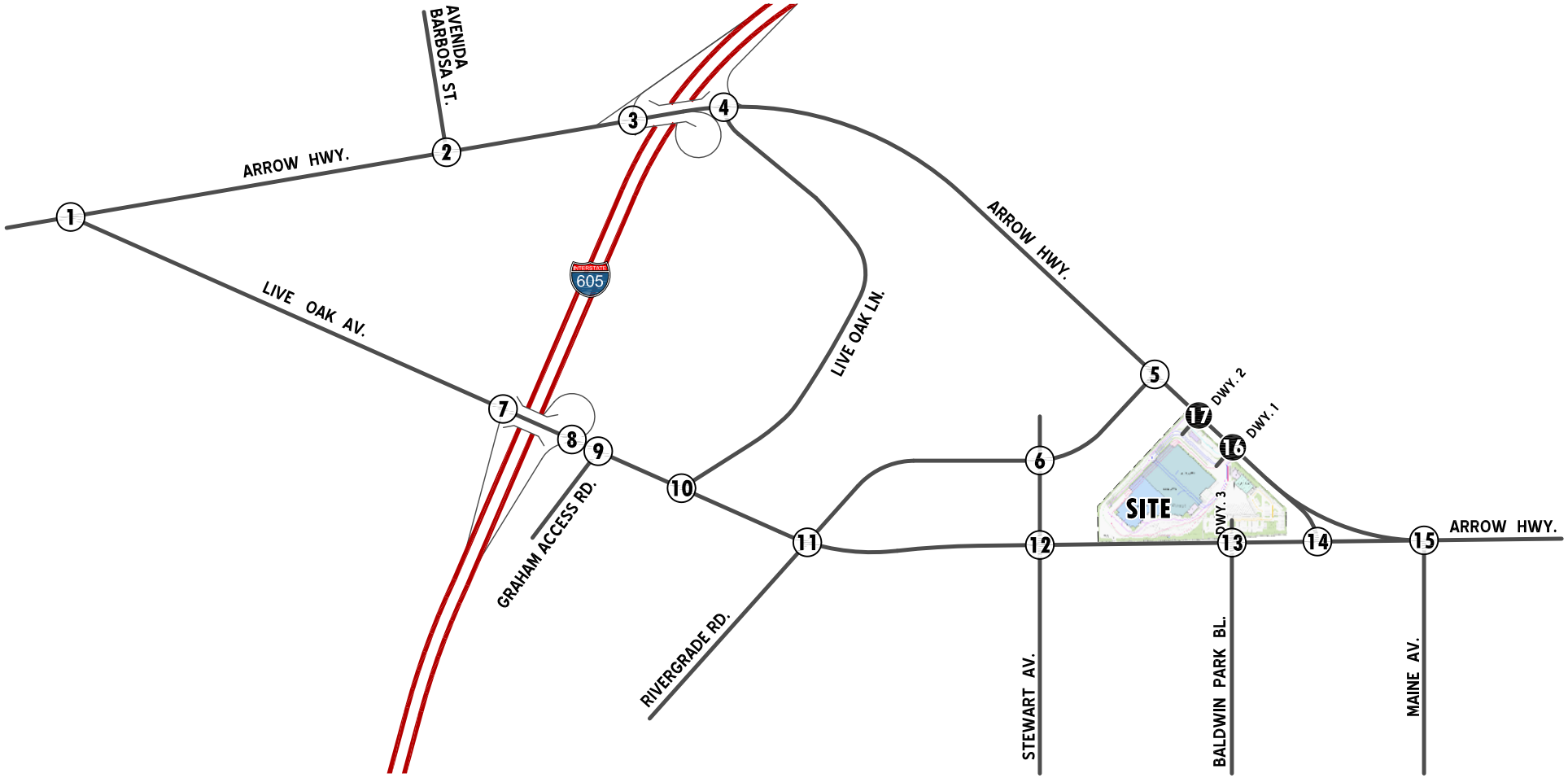


EXHIBIT ES-B

LOCATION MAP



LEGEND:

(15) = EXISTING INTERSECTION ANALYSIS LOCATION

(2) = FUTURE INTERSECTION ANALYSIS LOCATION

N

Table ES-1 Intersection Analysis Locations

ID	Intersection Location	Traffic Control	Jurisdiction
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)	Signalized	Irwindale
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)	Signalized	Irwindale
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	Signalized	Caltrans
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)	Unsignalized	Caltrans
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)	Signalized	Irwindale
6	Stewart Av. (NS) / Rivergrade Rd. (EW)	Signalized	Irwindale
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)	Signalized	Caltrans
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Unsignalized	Caltrans
9	Graham Access Rd. (NS) / Live Oak Av. (EW)	Signalized	Irwindale
10	Live Oak Ln. (NS) / Live Oak Av. (EW)	Unsignalized	Irwindale
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)	Signalized	Irwindale
12	Stewart Av. (NS) / Live Oak Av. (EW)	Signalized	Irwindale &Baldwin Park
13	Baldwin Park Bl./Dwy. 3 (NS) / Live Oak Av. (EW)	Signalized	Irwindale & Baldwin Park
14	Arrow Hwy. (NS) / Live Oak Av. (EW)	Signalized	Irwindale & Baldwin Park
15	Maine Av. (NS) / Arrow Hwy. (EW)	Signalized	Irwindale & Baldwin Park
16	Arrow Hwy. (NS) / Dwy. 1 (EW) - *(Future Intersection)*	Signalized	Irwindale
17	Arrow Hwy. (NS) / Dwy. 2 (EW) - *(Future Intersection)*	Unsignalized	Irwindale

Consistent with California Department of Transportation (Caltrans) NOP comments, the freeway mainline analysis locations include the segments on either side of key study area interchanges where operational analysis have been requested. The study area freeway mainline analysis locations include seven (7) I-605 Freeway mainline segments and six (6) I-210 Freeway mainline segments for both directions of flow as shown on Table ES-2:

Table ES-2 Freeway Mainline Segment Analysis Locations

ID	Freeway Mainline Segments
1	I-605 Northbound, South of Live Oak Avenue
2	I-605 Northbound, Between Live Oak Avenue and Eastbound Arrow Highway Loop On-Ramp
3	I-605 Northbound, Between Eastbound Arrow Highway Loop On-Ramp and Westbound Arrow Highway On-Ramp
4	I-605 Northbound, Immediately North of Arrow Highway On-Ramp

Table ES-2 Freeway Mainline Segment Analysis Locations (Cont.)

ID	Freeway Mainline Segments
5	I-605 Southbound, Immediately North of Arrow Highway Off-Ramps
6	I-605 Southbound, Between Arrow Highway Off-Ramps and Live Oak Avenue On-Ramps
7	I-605 Southbound, South of Live Oak On-Ramps
8	I-210 Westbound, Immediately east of Irwindale Avenue Westbound Off-Ramp
9	I-210 Westbound, Between Irwindale Avenue Westbound Loop On-Ramp and Irwindale Avenue Westbound Off-Ramp
10	I-210 Westbound, Immediately West of Irwindale Avenue Westbound On-Ramp
11	I-210 Eastbound, Immediately West of Irwindale Avenue Eastbound Off-Ramp
12	I-210 Eastbound, Between Irwindale Avenue Eastbound Off-Ramp and Irwindale Avenue Eastbound On-Ramp
13	I-210 Eastbound, Immediately East of Irwindale Avenue Eastbound Off-Ramp

Similar to the freeway mainline segments, the study area freeway merge/diverge ramp junction analysis locations include five (5) I-605 Freeway ramp junctions and five (5) I-210 Freeway ramp junctions for both directions of flow as shown on Table ES-3:

Table ES-3 Freeway Merge/Diverge Ramp Junction Analysis Locations

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)
2	I-605 Northbound - On-Ramp for Eastbound Arrow Highway (Merge)
3	I-605 Northbound - Direct On-Ramp for Westbound Arrow Highway (Merge)
4	I-605 Southbound - Off-Ramp at Arrow Highway (Diverge)
5	I-605 Southbound - On-Ramp at Live Oak Avenue (Merge)
6	I-210 Westbound - Off-Ramp at Irwindale Avenue (Diverge)
7	I-210 Westbound – Loop On-Ramp at Irwindale Avenue (Merge)
8	I-210 Westbound - Direct On-Ramp at Irwindale Avenue Highway (Merge)
9	I-210 Eastbound - Off-Ramp at Irwindale Avenue (Diverge)
10	I-210 Eastbound - On-Ramp at Irwindale Avenue (Merge)

In addition, Table ES-4 summarizes queuing analysis locations at the following on / off ramp intersections:

Table ES-4 Queuing Analysis Locations

ID	Intersection Location	Traffic Control	Jurisdiction
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	Signalized	Caltrans
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)	Signalized	Caltrans
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Unsignalized	Caltrans

The following summarizes the principal findings in the traffic analysis portions of this report:

For Existing (2013), Existing Plus Project, Interim Year (2016) Without and With Project, and Long Range (2035) Without Project conditions, the following intersection is projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Intersection Location	Jurisdiction
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

For Long Range (2035) With Project conditions, the following study area intersections are projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Intersection Location	Jurisdiction
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	Caltrans
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

Freeway Mainline Segment Analysis results indicate study area mainline segment locations operate at acceptable level of service (LOS "D" or better) during the peak hours under Existing and Existing plus Project Conditions. However, for Interim Year (2016) Without Project Conditions, the following study area freeway mainline segments are anticipated to operate at deficient level of service (LOS "E" or worse) during the peak hours during the peak hours, with existing geometry:

ID	Freeway Mainline Segments
10	I-210 Westbound, Immediately West of Irwindale Avenue Westbound On-Ramp
11	I-210 Eastbound, Immediately West of Irwindale Avenue Eastbound Off-Ramp
13	I-210 Eastbound, Immediately East of Irwindale Avenue Eastbound Off-Ramp

For Interim Year (2016) With Project Conditions and Long Range (2035) Without and With Project conditions, the following freeway mainline segment is projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry, in addition to the previously identified location under Interim Year (2016) Without Project Conditions:

ID	Freeway Mainline Segments
8	I-210 Westbound, Immediately east of Irwindale Avenue Westbound Off-Ramp

Merge/Diverge Ramp Junction Analysis results indicate study area ramp locations operate at acceptable level of service (LOS "D" or better) during the peak hours under Existing Conditions. However, for Existing plus Project Conditions, the following study area ramp location is anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)

For Interim Year (2016) Without and With Project Conditions and Long Range (2035) Without and With Project conditions, the following study area ramp location is anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry, in addition to the previously identified location under Existing plus Project Conditions:

ID	Freeway Merge/Diverge Ramp Junctions
6	I-210 Westbound - Off-Ramp at Irwindale Avenue (Diverge)

As the proposed project would contribute to the existing and forecasted deficient freeway segments, the project's contribution to these cumulative traffic impacts are considered cumulatively considerable.

Neither Caltrans nor the State has adopted a fee program that can ensure that locally-contributed impact fees will be tied to improvements to freeway mainlines, and only Caltrans has the

jurisdiction over mainline improvements. Because Caltrans has exclusive control over state highway improvements, ensuring that fair share contributions to mainline improvements are actually part of a program tied to implementation of mitigation is within the jurisdiction of Caltrans. As such, the City of Irwindale may decide whether specific overriding economic, legal, social, technological, or other benefits of the project outweigh the unavoidable adverse cumulative traffic impacts associated with the project. Based on the Synchro plus SimTraffic 8 simulation results, the vehicular queues appear to clear in a reasonable and timely fashion throughout the network under all traffic conditions, with the exception of the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue.

The following improvements are recommended to mitigate cumulative impacts at the deficient study area locations:

1. **2016 Without and With Project Conditions:**

   I-605 NB Off-Ramp (NS) / Live Oak Avenue (EW) (#8)

   - Install a traffic signal
   - Construct a 2nd northbound right turn lane.
   - Provide a 3rd westbound through lane by modifying the existing raised median. This will also provide additional queuing storage for the westbound left turn lane at the intersection of I-605 SB On-Ramp (NS) / Live Oak Avenue (EW).

2. **2035 with Project Conditions:**

   I-605 SB Off-Ramp (NS) / Arrow Highway (EW) (#3)

   - Construct a 2nd southbound left turn lane.

It should be noted that the abovementioned improvements are generally consistent with the *Traffic Study Report for I-605/Live Oak Avenue/Arrow Highway Interchanges December 14, 2012)*, prepared by Advantec Consulting Engineers.

1.0 INTRODUCTION

1.1 Purpose of Report and Study Objectives

The purpose of this traffic impact analysis is to evaluate the proposed materials recovery and transfer station from a traffic circulation standpoint. The proposed project is located east of the I-605 Freeway, on the northwesterly quadrant of Arrow Highway and Live Oak Avenue in the City of Irwindale.

To satisfy the environmental analysis requirements per the City of Irwindale Policy Guidelines for Traffic Impact Reports, the California Department of Transportation (Caltrans) requirements/comments on the Notice of Project (NOP), the California Environmental Quality Act (CEQA) and the Los Angeles County Congestion Management Program (CMP), the following time frames / scenarios will be evaluated in the traffic analysis:

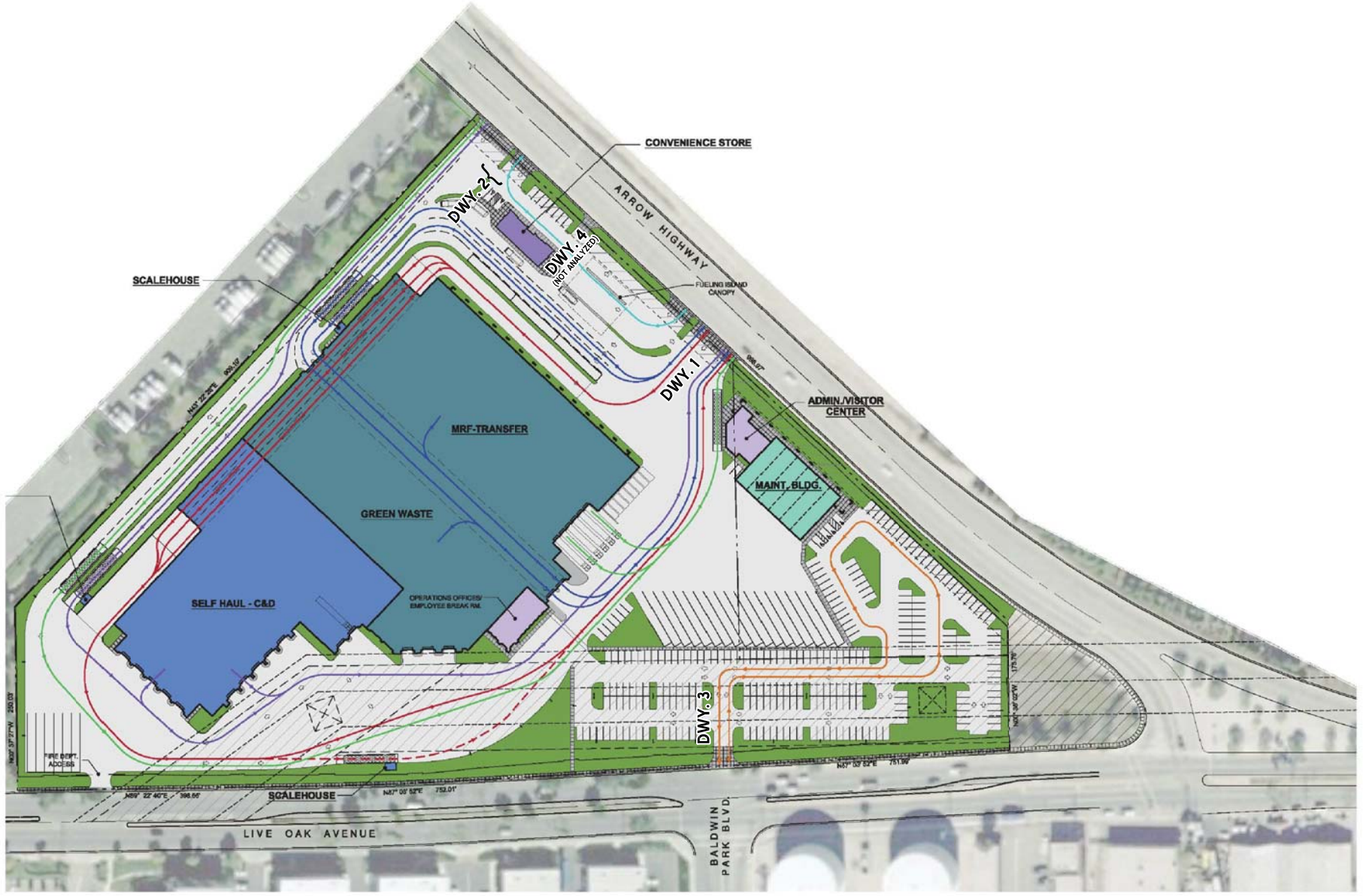
- Existing (2013) Conditions
- Existing Plus Project Conditions
- Interim Year (2016) Conditions Without and With the Project
- Long Range (2035) Conditions Without and With the Project

1.2 Project Description

Exhibit 1-A shows the site plan of the proposed project. As indicated on Exhibit 1-A, the proposed project site would be grouped into three (3) primary areas: 1.) Materials Recovery Facility and Transfer Station, 2.) Convenience Store / Fueling Facility and 3.) Administrative/Visitor Center and Maintenance Building. The Materials and Recovery Facility and Transfer Station would include the majority of the building development totaling approximately 228,432 square feet. The Convenience Store / Fueling Facility

EXHIBIT 1-A

SITE PLAN



would be a separate structure located on the north-east portion of the project site totaling approximately 2,390 square feet. The Administrative/Visitor Center and Maintenance Building is approximately 15,200 square feet. In addition, a traffic signal will be installed at Driveway 1 along Arrow Highway as a Project design feature.

The Proposed Project proposes a maximum throughput of up to 6,000 tons per day. The maximum daily number of truck trips would be 2,456 truck round trips (including collection trucks, transfer trucks and self-haul trucks). The daily trips include 249 self-haul trips, 1,137 packer truck trip, 66 end dump truck trips, 445 roll-off truck trips, and 559 transfer truck trips. The Proposed Project also includes 345 employee trips. An additional 751 daily trips would be associated with the convenience store/service station. The convenience store/service station would occur with the Proposed Project but is not included in the Baseline Condition.

For the purpose of this TIA report, the truck trips have been converted to passenger car equivalents (PCE). The project is anticipated to generate a net total of approximately 8,333 (PCE) trip-ends per day, with 664 AM peak hour (PCE) trips and 664 PM peak hour (PCE) trips.

1.3 Traffic Operations Analysis

1.3.1 Intersection Delay Analysis Methodology

For this study, the technical guide used in the evaluation of traffic operations is the 2000 Highway Capacity Manual (HCM) (Transportation Research Board Special Report 209). The HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate Level of Service (LOS) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted.

The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS "A" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
- LOS "B" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.
- LOS "C" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.
- LOS "D" represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.
- LOS "E" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.
- LOS "F" is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

Uninterrupted flow is generally found only on limited access (freeway) facilities in urban areas. The level of service is based on the HCM, Table 3-1.

The definitions of level of service for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control.

The level of service is typically dependent on the quality of traffic flow at the intersections along a roadway. The HCM methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control.

For signalized intersections, average total delay per vehicle for the overall intersection is used to determine level of service. Levels of service at the study intersections have been evaluated using an HCM intersection analysis program (Synchro Version 8). The level of service has been determined at signalized intersections using data collected describing the intersection configuration, traffic signal timing, and traffic volumes to calculate average intersection delay.

The study area intersections which are stop sign controlled with stop-control on the minor street only have been analyzed using the two-way stop-controlled unsignalized intersection analysis methodology of the HCM. For these intersections, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the major street. The level of service criteria for this type of intersection analysis is based on total delay per vehicle for the worst minor street movement(s).

The levels of service are defined in terms of average delay for the HCM intersection analysis methodology is as follows:

Level of Service	Average Total Delay per Vehicle (Seconds)	
	Signalized	Unsignalized
A	0 to 10.00	0 to 10.00
B	10.01 to 20.00	10.01 to 15.00
C	20.01 to 35.00	15.01 to 25.00
D	35.01 to 55.00	25.01 to 35.00
E	55.01 to 80.00	35.01 to 50.00
F	80.01 and up	50.01 and up

Urban segments (i.e., segments on roadways that are generally signalized) do not typically require segment analysis. Segment requirements can normally be determined by the analysis of lane requirements at intersections.

For Existing and Future 'Without Project' conditions LOS analysis, the existing signal timing plans (provided by City of Irwindale staff and Caltrans staff) have been utilized for the study area intersections. For 'With Project' conditions, the existing

signal timing plans in conjunction with potential signal optimization timing opportunities (e.g. – lengthier green times and separate / protected left turn phases, where necessary) were used to calculate 'With Project' LOS.

A saturation flow rate of 1,900 vehicles per hour of green (vphg) per lane is utilized in each scenario for HCM calculation purposes. The signalized study area intersections have also been analyzed using the Intersection Capacity Utilization (ICU) technique. To calculate an ICU, the volume of traffic using the intersection is compared with the capacity of the intersection. ICU is usually expressed as a volume to capacity (V/C) ratio. The V/C represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

For unsignalized study area intersections, explicit ICU volume to capacity ratios cannot be calculated. Per the County of Los Angeles CMP guidelines (page B-5), the V/C ratio for an unsignalized intersection must be converted/extracted from the HCM analysis.

For all study area signalized intersections, ICU analysis has also been performed using the Synchro 8 software. It should be noted that the Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information. Therefore, consistent with the City's guidelines, both the Synchro v/c ratio (ICU) and delay results are presented in this report. The V/C ratio and corresponding Level of Service (LOS) are as follows:

Level of Service	Critical Volume To Capacity Ratio
A	0.00 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
E	0.91 - 1.00
F	>1.00

1.3.2 Freeway Mainline Analysis Methodology

The freeway segments have been evaluated in this report based upon peak hour directional volumes. The freeway segment analysis is based on the methodology described in Chapter 23 of the HCM and performed using HCS+ software. The performance measure preferred by Caltrans to calculate LOS is density. Density is expressed in terms of passenger cars per mile per lane. The three measures of speed, density, and flow or volume are interrelated. Table below illustrates the freeway segment LOS thresholds for each density range utilized for this analysis.

Freeway Mainline LOS Thresholds

Level of Service	Description	Density Range (pc/mi/ln)[1]
A	Free-flow operations in which vehicles are relatively unimpeded in their ability to maneuver within the traffic stream. Effects of incidents are easily absorbed.	0.0 – 11.0
B	Relative free-flow operations in which vehicle maneuvers within the traffic stream are slightly restricted. Effects of minor incidents are easily absorbed.	11.1 – 18.0
C	Travel is still at relative free-flow speeds, but freedom to maneuver within the traffic stream is noticeably restricted. Minor incidents may be absorbed, but local deterioration in service will be substantial. Queues begin to form behind significant blockages.	18.1 – 26.0
D	Speeds begin to decline slightly and flows and densities begin to increase more quickly. Freedom to maneuver is noticeably limited. Minor incidents can be expected to create queuing as the traffic stream has little space to absorb disruptions.	26.1 – 35.0
E	Operation at capacity. Vehicles are closely spaced with little room to maneuver. Any disruption in the traffic stream can establish a disruption wave that propagates throughout the upstream traffic flow. Any incident can be expected to produce a serious disruption in traffic flow and extensive queuing.	35.1 – 45.0
F	Breakdown in vehicle flow.	>45.0

[1] *pc/mi/ln = passenger cars per mile per lane. Source: HCM 2000, Chapter 23*

The specification of maximum densities for LOS "A" through "D" is based on the collective professional judgment of the members of the Committee on Highway Capacity and Quality of Service for the Transportation Research Board. The upper value shown for LOS "E" (45 pm/mi/ln) is the maximum density at which sustained flows at capacity are expected to occur.

1.3.3 Freeway Ramp Analysis Methodology

The ramp operation analyses have been based on the following HCM methodologies: Merge, Diverge and/or Weave analysis methods. The Weave analysis method is performed between an on-ramp and an off-ramp of adjacent interchanges spaced less than 2,500 feet apart. For ramps of adjacent interchanges spaced more than 2,500 feet apart, Merge and Diverge analysis methods are used for on-ramps and off-ramps, respectively. For this assessment, Merge and Diverge analyses have been used to be consistent with the Traffic Study Report for I-605/Live Oak Avenue/Arrow Highway Interchanges (2012), prepared by Advantec Consulting Engineers.

The merge/diverge analysis is based on the HCM Ramps and Ramp Junctions analysis method and performed using HCS+ software. The measure of effectiveness (reported in passenger car/mile/lane) are calculated based on the existing number of travel lanes, number of lanes at the on and off ramps both at the analysis junction and at upstream and downstream locations (if applicable) and acceleration/deceleration lengths at each merge/diverge point. Table below presents the merge/diverge area LOS thresholds for each density range utilized for this analysis.

Freeway Merge/Diverge Ramp Junction LOS Thresholds

Level of Service	Density Range (pc/mi/ln)[1]
A	0.0 – 10.0
B	10.1 – 20.0
C	20.1 – 28.0
D	28.1 – 35.0
E	>35.0
F	Demand Exceeds Capacity

[1] *pc/mi/ln = passenger cars per mile per lane. Source: HCM 2000, Chapter 25*

1.3.4 Intersection Queuing Analysis Methodology

A traffic signal progression analysis has been conducted at the I-605 freeway on/off ramp intersections to evaluate vehicular queuing and stacking length requirements by considering the signal timing and physical spacing of intersections. The progression results have been based on the output from the Synchro plus SimTraffic 8 software program.

1.4 Definition of Deficiency and Significant Impact

The following definitions of deficiencies and significant impacts have been developed in accordance with City of Irwindale requirements.

1.4.1 Definition of Deficiency

The City of Irwindale requires the following LOS criteria be implemented:

- LOS will not exceed LOS "D" at all intersections (excluding State Highway facilities) on arterial and collector streets.

In addition, the study intersections along Live Oak Avenue, east of Rivergrade Road, are located on the City boundary of Irwindale and Baldwin Park. The City of Baldwin Park General Plan (November 2002) states that the City will maintain level of service "D" at all City intersections. As such, LOS "D" has also been considered acceptable at any intersections and roadways within the City of Baldwin Park.

For State Highway facilities, the Caltrans Guide for the Preparation of Traffic Impact Studies (December 2002) states that Caltrans endeavors to maintain a target LOS at the transition between LOS"C" and LOS "D", however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained. Therefore, for the purpose of this report, LOS "D" is used as

the maximum acceptable threshold for study area ramp intersections and freeway mainline and ramp segments.

1.4.2 Definition of Significant Impact

- When a signalized intersection operates at mid-range LOS "D" (45.0 seconds) or better under existing or future baseline conditions, and the addition of project trips degrades the intersection operations to LOS "E" or "F". The project mitigation should bring the facility to operate at mid-range LOS "D" at minimum.

- When a signalized intersection operates at mid-range LOS "E" (67.5 seconds) for State Highways or better under existing or future baseline conditions, and the addition of project trips degrades the intersection operations to 67.6 seconds (LOS "E") or worse (LOS "F"). The project mitigation should bring the facility to operate at mid-range LOS "E" at minimum.

- When a signalized intersection operates at LOS "E" for non-state or LOS "F" (for State) under existing or future baseline conditions, and the addition of more than 50 peak hour project trips contributes to the continuing operational failure at the intersection. The project mitigation should bring the facility to pre-project conditions.

- At an unsignalized intersection, when the minor stop-controlled approach operates at LOS **"F"** and does not have acceptable operation in terms of total control delay, and the addition of project trips increases the total control delay to more than 4.0 vehicle hours for a single lane approach or 5.0 vehicle hours for a multi-lane approach. The project mitigation should bring the facility to operate at LOS "E" (at a minimum) or bring the total control delay to less than 4.0 vehicle-hours for a single lane approach or 5.0 vehicle-hours for a multi-lane approach (at a minimum).

- At an unsignalized intersection, when the minor stop controlled approach operates at LOS **"F"** and does not have an acceptable operation in terms of total control delay, and the addition of more than 50 peak hour project trips contributes to the continuing operational failure at the minor approach. The project mitigation should bring the facility to pre-project conditions.

1.5 Los Angeles County Congestion Management Program (CMP) Consistency Requirements

The proposed project is located within the jurisdiction of the City of Irwindale in Los Angeles County. Therefore, this traffic study is required to address all CMP requirements of the Los Angeles County Congestion Management Program. The purpose of the Los Angeles County Congestion Management Program (CMP) is to address the impact of local growth on the regional transportation system. The goals of the CMP are summarized below:

- To link local land use decisions with their impacts on regional transportation, and air quality;
- To develop a partnership among transportation decision makers on devising appropriate transportation solutions that include all modes of travel; and
- To provide transportation projects which are eligible to compete for state gas tax funds.

The CMP offers the following mechanisms to meet these goals:

- Tracking and analysis to determine how the regional highway and transit systems are performing;
- Analysis of the impacts of local land use decisions on regional transportation;
- Local implementation of Transportation Demand Management design guidelines that ensure new development includes improvements supportive of transit and TDM;
- Tracking new building activity throughout Los Angeles County; and Implementation of local strategies which benefit the regional transportation system and offset the impact of new development.

1.6 Principal Findings

For Existing (2013), Existing Plus Project, Interim Year (2016) Without and With Project, and Long Range (2035) Without Project conditions, the following study area intersection is projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Intersection Location	Jurisdiction
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

For Long Range (2035) With Project conditions, the following study area intersections are projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Intersection Location	Jurisdiction
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	Caltrans
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

Freeway Mainline Segment Analysis results indicate study area mainline segment locations operate at acceptable level of service (LOS "D" or better) during the peak hours under Existing (2013) and Existing plus Project Conditions. However, for Interim Year (2016) Without Project Conditions, the following study area freeway mainline segments are anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Mainline Segments
10	I-210 Westbound, Immediately West of Irwindale Avenue Westbound On-Ramp
11	I-210 Eastbound, Immediately West of Irwindale Avenue Eastbound Off-Ramp
13	I-210 Eastbound, Immediately East of Irwindale Avenue Eastbound Off-Ramp

For Interim Year (2016) With Project Conditions and Long Range (2035) Without and With Project conditions, the following study area freeway mainline segments are anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Mainline Segments
8	I-210 Westbound, Immediately east of Irwindale Avenue Westbound Off-Ramp
10	I-210 Westbound, Immediately West of Irwindale Avenue Westbound On-Ramp
11	I-210 Eastbound, Immediately West of Irwindale Avenue Eastbound Off-Ramp
13	I-210 Eastbound, Immediately East of Irwindale Avenue Eastbound Off-Ramp

Merge/Diverge Ramp Junction Analysis results indicate that the following study area freeway ramp location is projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry, under Existing plus Project Conditions:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)

For Interim Year (2016) Without and With Project Conditions and Long Range (2035) Without and With Project conditions, the following study area freeway ramp locations are anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)
6	I-210 Westbound - Off-Ramp at Irwindale Avenue (Diverge)

In addition, the I-605 queuing analysis results indicate that vehicular queues for the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue appears to exceed available storage length under all traffic scenarios.

As the proposed project would contribute to the existing and forecasted deficient freeway segments, the project's contribution to these cumulative traffic impacts are considered cumulatively considerable.

Neither Caltrans nor the State has adopted a fee program that can ensure that locally-contributed impact fees will be tied to improvements to freeway mainlines, and only Caltrans has the jurisdiction over mainline improvements. Because Caltrans has

exclusive control over state highway improvements, ensuring that fair share contributions to mainline improvements are actually part of a program tied to implementation of mitigation is within the jurisdiction of Caltrans. As such, the City of Irwindale may decide whether specific overriding economic, legal, social, technological, or other benefits of the project outweigh the unavoidable adverse cumulative traffic impacts associated with the project.

1.7 Project Fair Share Calculations

The project fair share percentages (%) towards the required improvements have also been calculated. Table 8-1 summarizes the 2035 With Project fair share percentages for the proposed project. As shown on Table 8-1, the project is contributes approximately 33% of the new traffic at the intersection of I-605 SB Off-Ramp / Arrow Highway and I-605 NB Off-Ramp / Live Oak Avenue.

1.8 Recommendations

1.8.1 Off-Site Improvements

Existing plus Project, Interim Year (2016) Without and With Project, and Long Range (2035) conditions, the following improvements are recommended:

I-605 NB Off-Ramp (NS) / Live Oak Avenue (EW) (#8)

- Install a traffic signal
- Construct a 2nd northbound right turn lane.
- Provide a 3rd westbound through lane by modifying the existing raised median. This will also provide additional queuing storage for the westbound left turn lane at the intersection of I-605 SB On-Ramp (NS) / Live Oak Avenue (EW).

In addition, the following improvements are recommended for 2035 with Project Conditions:

I-605 SB Off-Ramp (NS) / Arrow Highway (EW) (#3)

- Construct a 2nd southbound left turn lane.

It should be noted that the above mentioned improvements are generally consistent with the *Traffic Study Report for I-605/Live Oak Avenue/Arrow Highway Interchanges (December 14, 2012)*, prepared by Advantec Consulting Engineers.

1.8.2 On-Site Circulation Recommendations

The recommended site access driveway improvements for the Project are described below. Exhibit 8-D illustrates the on-site and site adjacent recommended roadway lane improvements. Construction of on-site and site adjacent improvements shall occur in conjunction with adjacent Project development activity or as needed for Project access purposes.

Arrow Highway (NS) / Driveway 1 (EW) (#16) – Install a traffic signal and construct the intersection with the following geometrics:
Northbound Approach: One left turn lane (two way turn lane) and two through lanes.
Southbound Approach: Two through lanes and one right turn lane.
Eastbound Approach: One left turn lane and one right turn lane
Westbound Approach: N/A

Arrow Highway (NS) / Driveway 2 (EW) (#17) – Install a stop control on the eastbound approach and construct the intersection with the following geometrics:
Northbound Approach: One left turn lane (two way turn lane) and two through lanes.
Southbound Approach: Two through lanes and one right turn lane.
Eastbound Approach: One shared left turn and right turn lane.
Westbound Approach: N/A

Driveway 3 - Baldwin Park Boulevard (NS) / Live Oak Av. (EW) (#13) – Modify traffic signal to include Project Driveway 3 (north leg) and construct the intersection with the following geometrics:

Northbound Approach: Two left turn lanes and one shared through-right turn lane.

Southbound Approach: One left turn lane and one shared through-right turn lane.

Eastbound Approach: One left turn lane (100-foot pocket length), two through lanes, and one defacto right turn lane.

Westbound Approach: One left turn lane, two through lanes, and one right turn lane.

Vehicle queuing on-site at the Arrow Highway / Driveway 1 intersection is estimated to require approximately 240 feet of back-up / storage length during peak hours. The Project site plan accommodates this on-site peak hour queuing activity. Inbound Project traffic does not cross the paths of outbound vehicles in the vicinity of Driveway 1. However, the site access recommendation shown on Exhibit 8-D include changes to the convenience store/gas pump access configuration in order to reduce conflicting auto turning movements in the vicinity of Driveway 1. Those recommendations include the following:

- Provide a right-in/right-out access for the convenience store located between Driveway 1 and Driveway 2 along Arrow Highway.
- Eliminate convenience store Driveway located immediately to the north of Driveway 1 along Arrow Highway.
- Move Convenience Store/Gas pump access further into the site (away from signalized intersection, increasing the throat length of the driveway).
- Provide a 28-foot internal access driveway connecting MRF main driveway to convenience store with gas pumps.
- On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project site.
- Sight distance at the project driveways should be reviewed with respect to standard Caltrans and City of Irwindale sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

2.0 PROJECT DESCRIPTION

2.1 Location

The proposed project is located on the northwest corner of Arrow Highway and Live Oak Avenue in the City of Irwindale, as previously shown on Exhibit 1-A.

2.2 Land Use and Intensity

The project site is currently zoned for Heavy Manufacturing and is designated for commercial land use in the City's General Plan. The project site is located in an industrial area, with various commercial/industrial, residential, and recreational land uses in surrounding areas.

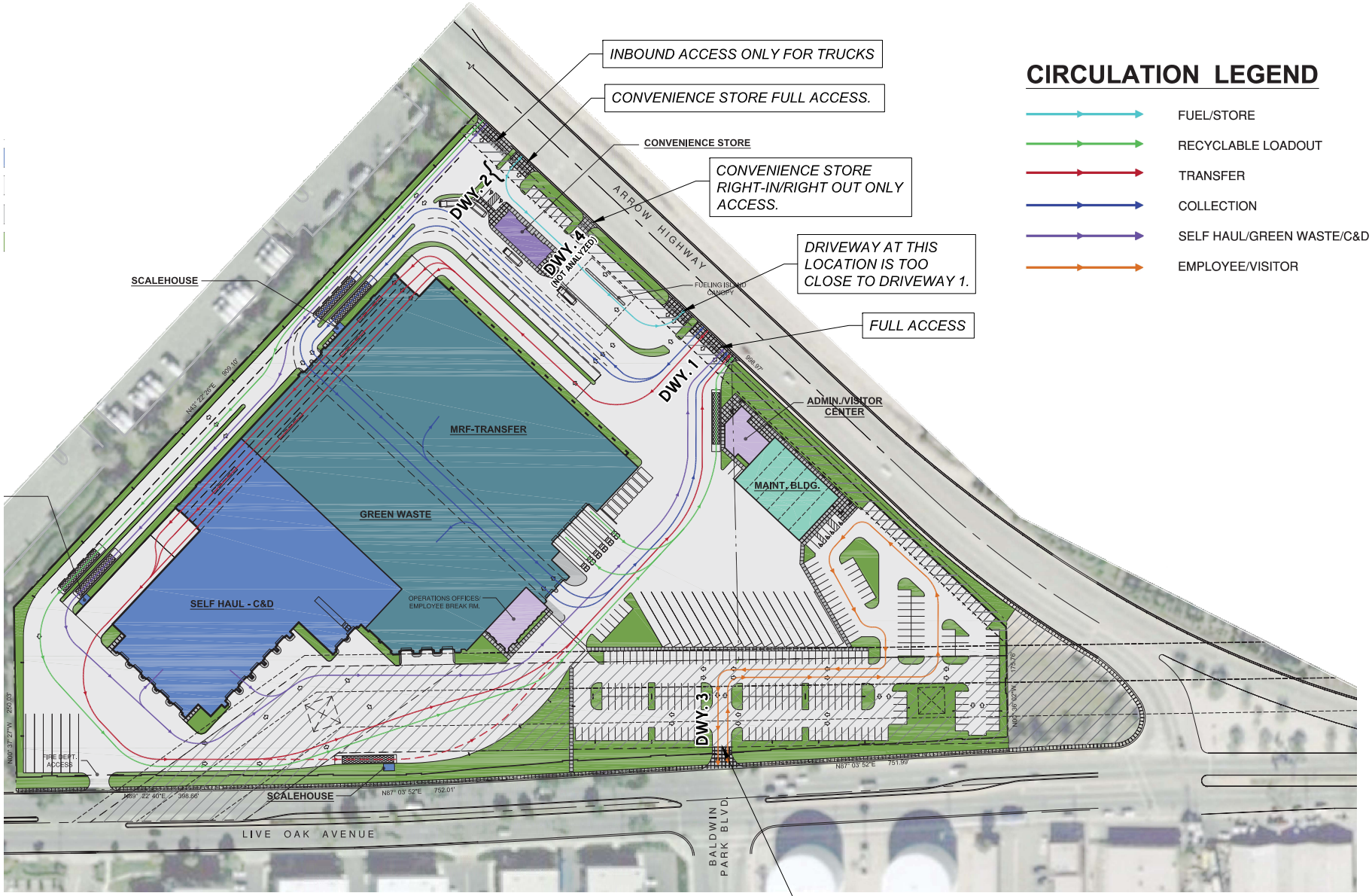
Exhibit 1-A (previously presented) shows the site plan proposed project. As indicated on Exhibit 1-A, the proposed project site would be grouped into three (3) primary areas: 1.) Materials Recovery Facility and Transfer Station, 2.) Convenience Store / Fueling Facility and 3.) Administrative/Visitor Center and Maintenance Building. The Materials and Recovery Facility and Transfer Station would include the majority of the building development totaling approximately 228,432 square feet. The Convenience Store / Fueling Facility would be a separate structure located on the north-east portion of the project site totaling approximately 2,390 square feet. The Administrative/Visitor Center and Maintenance Building is approximately 15,200 square feet.

2.3 Project Access

Exhibit 2-A illustrates the proposed Access and On-Site Circulation for the project. Primary access for transfer trucks to and from the project site would be from Arrow Highway, and directed towards Interstate 605 for regional transport, utilizing Irwindale roadways. Two additional access points to the south from Live Oak Avenue will serve for employees, visitors and Fire Department access only. Site access into the Fueling

EXHIBIT 2-A

ACCESS AND ON-SITE CIRCULATION



CIRCULATION LEGEND

- FUEL/STORE
- RECYCLABLE LOADOUT
- TRANSFER
- COLLECTION
- SELF HAUL/GREEN WASTE/C&D
- EMPLOYEE/VISITOR

N

Facility/Convenience Store area would be located on Arrow Highway. For the purpose of this report, only the full access driveways are analyzed. As shown in Exhibit 2-A, Driveway 1 is proposed to be the only full access for trucks. Driveway 2 is proposed as an entrance only for trucks and full access for passenger cars accessing the convenience store/fueling facility. Driveway 3 is proposed to be utilized by passenger cars only (i.e. – employee and visitor traffic). Driveway 4, located south of Driveway 2, is proposed as right-in/right-out only access for the convenient store/fueling facility. The convenience store/gas station driveway immediately adjacent to Driveway 1 is recommended to be eliminated, in conjunction with improved internal connectivity with Driveway 1 (see Section 8 of this report).

2.4 Phasing and Timing

The project will be constructed in one phase and expected to become operational in 2016. The project is expected to process approximately 6,000 tons of material per day with up to 345 employees.

2.5 Project Trip Distribution

Under the Proposed Project, the truck trips are processed at the Irwindale Facility and then transported to the Mid-Valley Landfill (85 percent of trips) and San Timoteo Landfill (15 percent of trips); with a weighted average one-way travel distance of 38 miles. The recycling materials are sent to the Port of Los Angeles/Long Beach, an average of 34 miles travel distance. The composting materials are sent to Victorville (American Organics), an average of 73 miles travel distance. The waste is estimated to be 46 percent landfill material, 35 percent recycling material, and 19 percent composting material for the Proposed Project.

Materials/waste headed inbound into the proposed project would be recovered from cities such as the City of Irwindale, Azusa, Covina, Monrovia, Monterey Park, Glendora, San Marino, Sierra Madre, West Covina, and additional nearby cities. Subsequent to the processing of the inbound materials/waste, recovered materials would be transferred to compost facilities in Victorville or to the ports of Los Angeles and Long

Beach for overseas shipping to recycling plants. The remaining/unrecoverable waste materials would be transported to one of several landfills in Los Angeles County, Riverside County, or to other regional landfills.

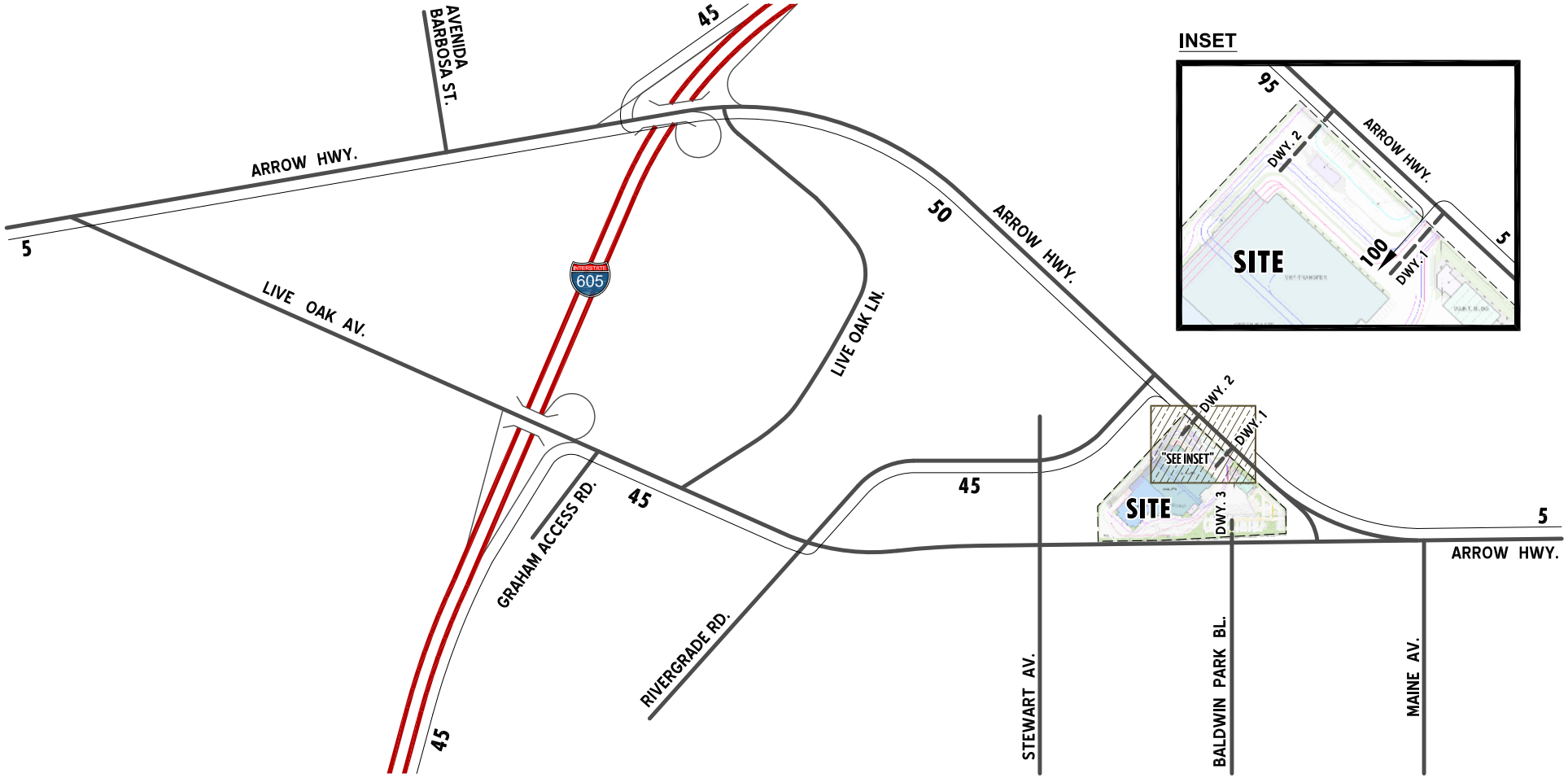
Regional access to the site is provided by a number of major freeways, including Interstate Freeway 10 (I-10) to the south, I-605 Freeway to the west and I-210 Freeway to the north. However, based on discussion with the project team, project related truck traffic will be accessing the freeway system via the I-605 Freeway On and Off Ramps. Local access to the project site is anticipated to be served by the following roadways:

- Rivergrade Road
- Stewart Avenue
- Baldwin Park Boulevard
- Arrow Highway
- Live Oak Avenue

Exhibit 2-B presents the Collection Trucks and Roll-Off Trucks trip distribution patterns for the proposed project. The trip distribution anticipated for the Collection Trucks and Roll-Off Trucks represent the traffic pattern for trucks/vehicles bringing commodities into the site for processing. As shown on Exhibit 2-B, 45% of the "Collection Trucks and Roll-Off Trucks" are anticipated to travel to/from the north (via the I-605 Freeway) and 45% to/from the south (via I-605 Freeway). As also shown on Exhibit 2-B, 5% of the "Collection Trucks and Roll-Off Trucks" are anticipated to travel along Arrow Highway to the west.

Exhibit 2-C presents the Self-Haul/Contractor trip distribution patterns for the proposed project. As shown on Exhibit 2-C, 40% of the Self-Haul/Contractor vehicles are anticipated to travel along Arrow Highway to/from the north and 40% along Live Oak Avenue to/from the I-605 Freeway to/from the south. As also shown on Exhibit 2-C, 5% of the Self-Haul/Contractor vehicles are anticipated to travel to the west along Arrow Highway and to the east along Live Oak Avenue. The self-haul/contractor trucks are proposed to utilize Driveway 2 for entering the site and Driveway 1 for exiting the site. The trip distribution anticipated for the "Self-Haul/Contractor" vehicles represent the traffic pattern for trucks/vehicles bringing commodities into the site for processing.

COLLECTION TRUCK (INCLUDING PACKER, END DUMP & ROLL-OFF TRUCKS) INBOUND TRIP DISTRIBUTION

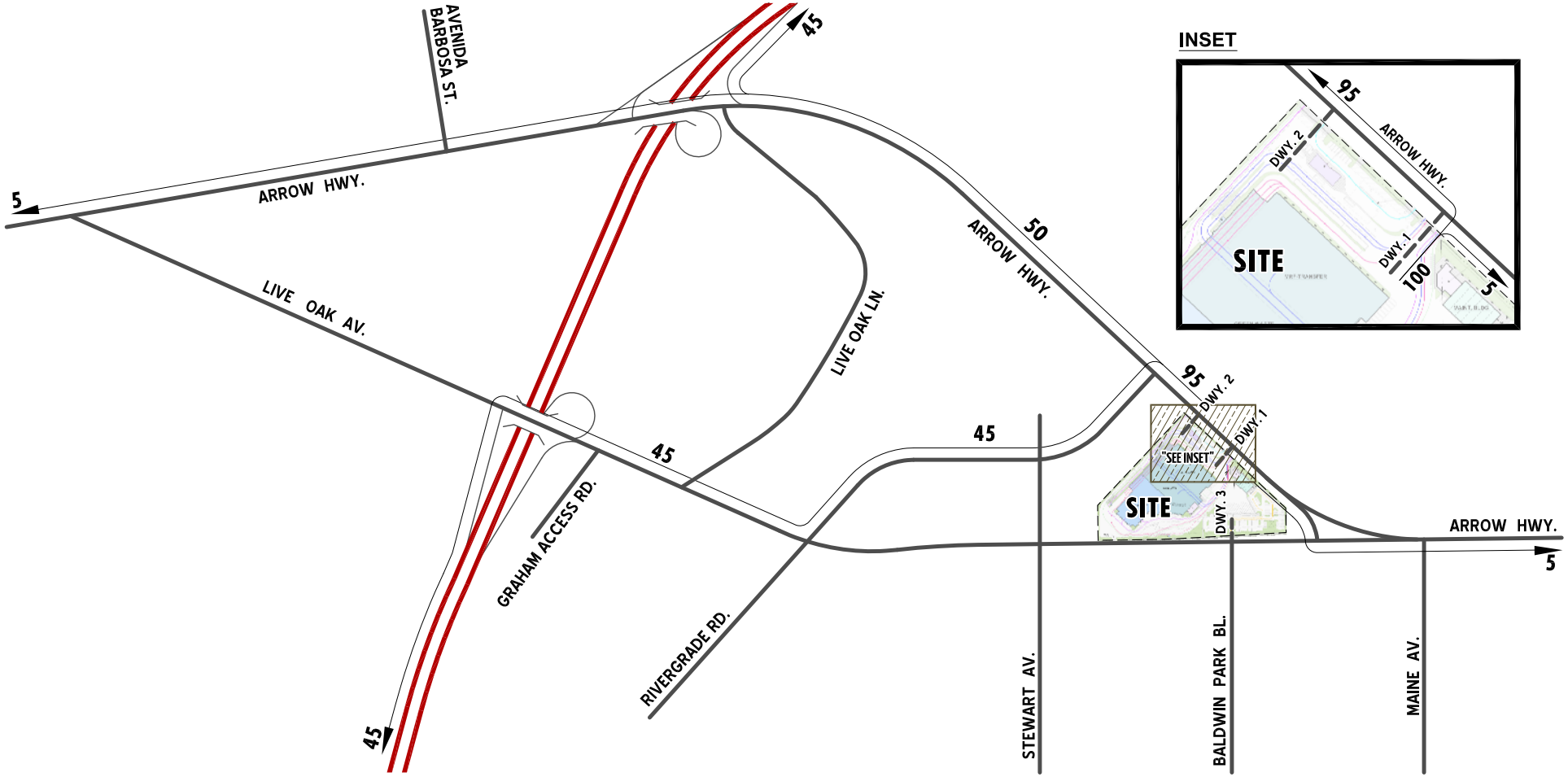


LEGEND:

10 = PERCENT TO PROJECT

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COLLECTION TRUCK (INCLUDING PACKER, END DUMP & ROLL-OFF TRUCKS) OUTBOUND TRIP DISTRIBUTION



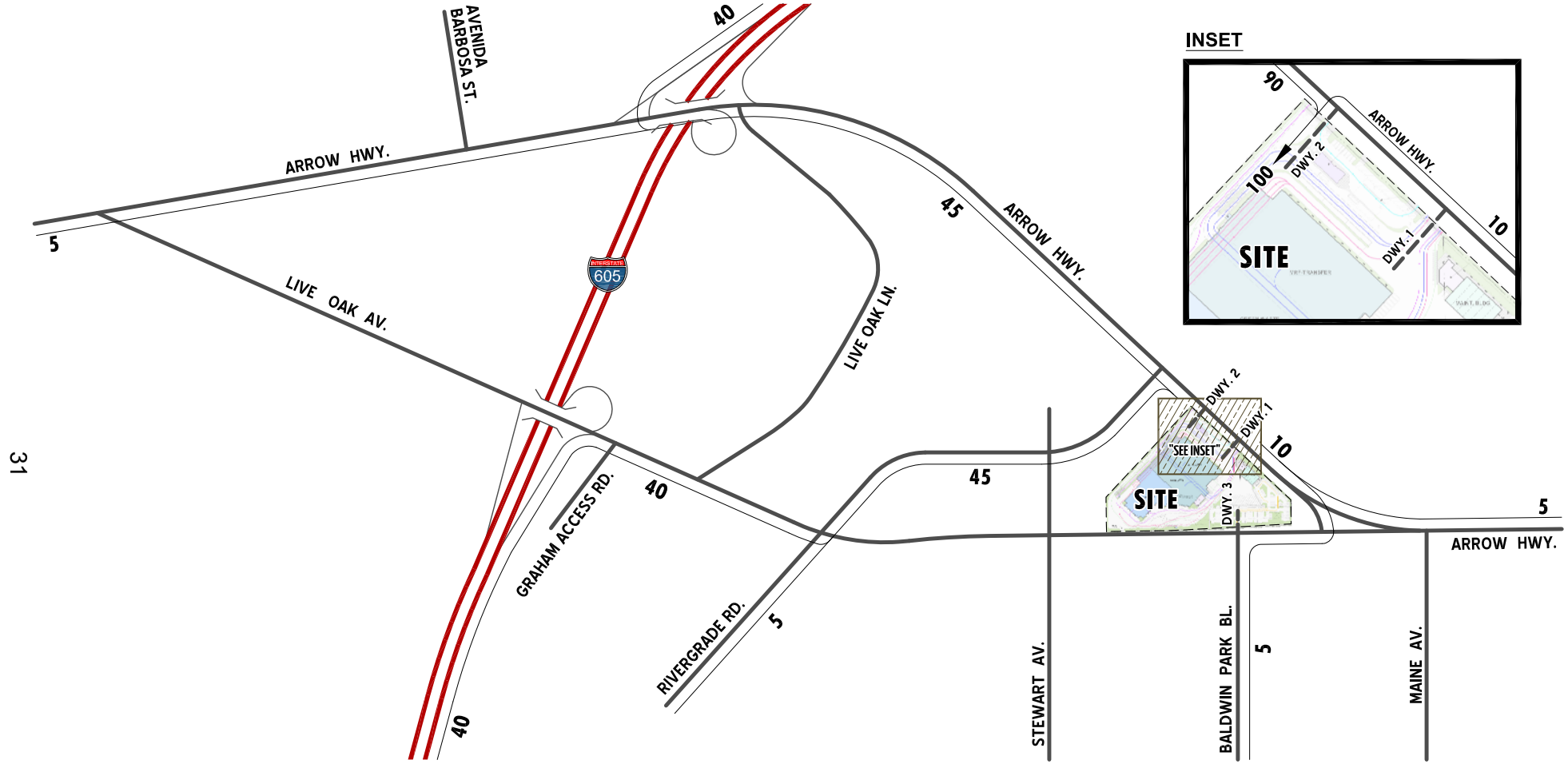
LEGEND:

10 = PERCENT FROM PROJECT

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EXHIBIT 2-C (Page 1 of 2)

SELF HAUL/CONTRACTOR TRUCK INBOUND TRIP DISTRIBUTION



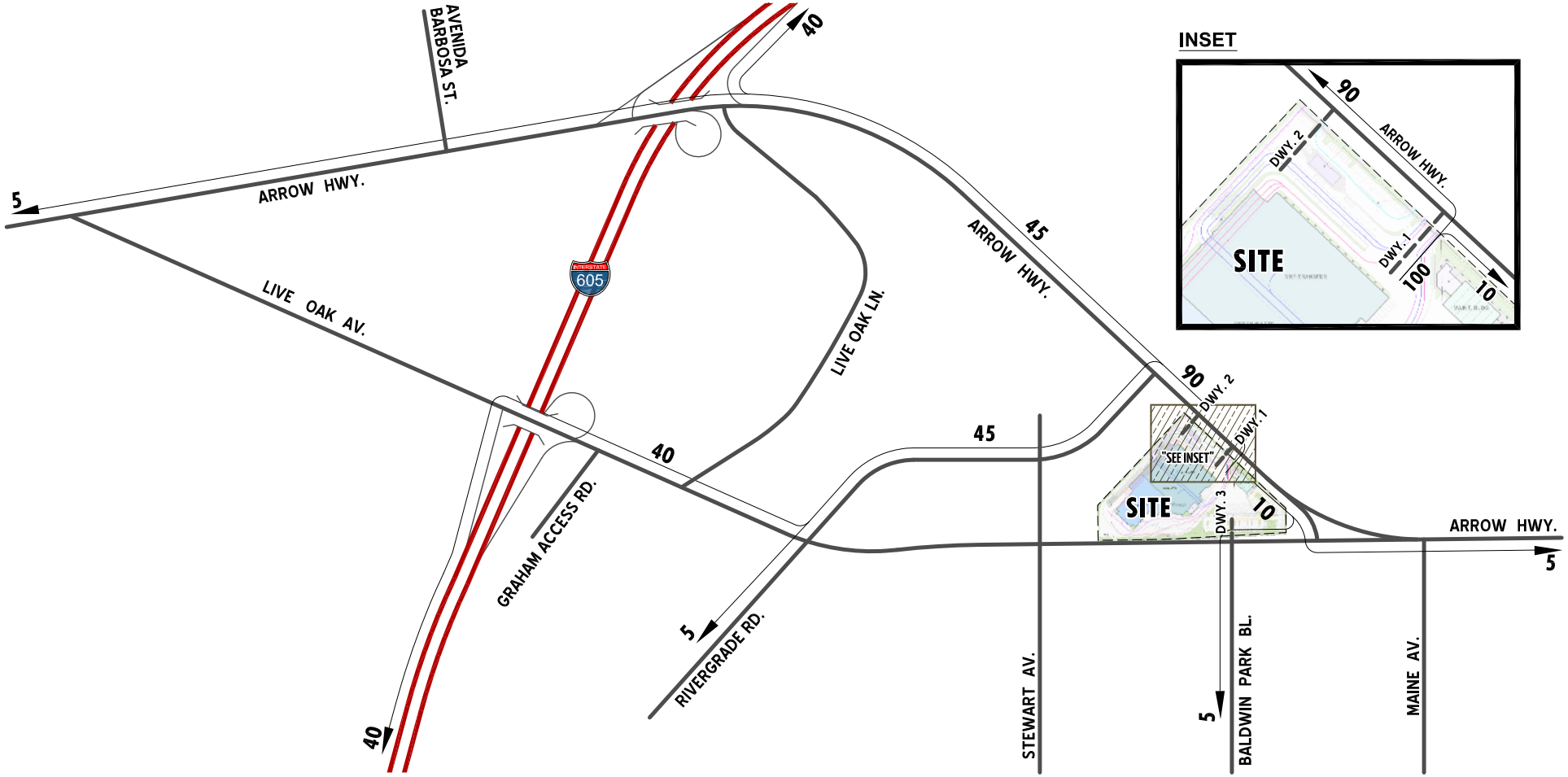
LEGEND:

10 = PERCENT TO PROJECT

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EXHIBIT 2-C (Page 2 of 2)

SELF HAUL/CONTRACTOR TRUCK OUTBOUND TRIP DISTRIBUTION



LEGEND:

10 = PERCENT FROM PROJECT

N

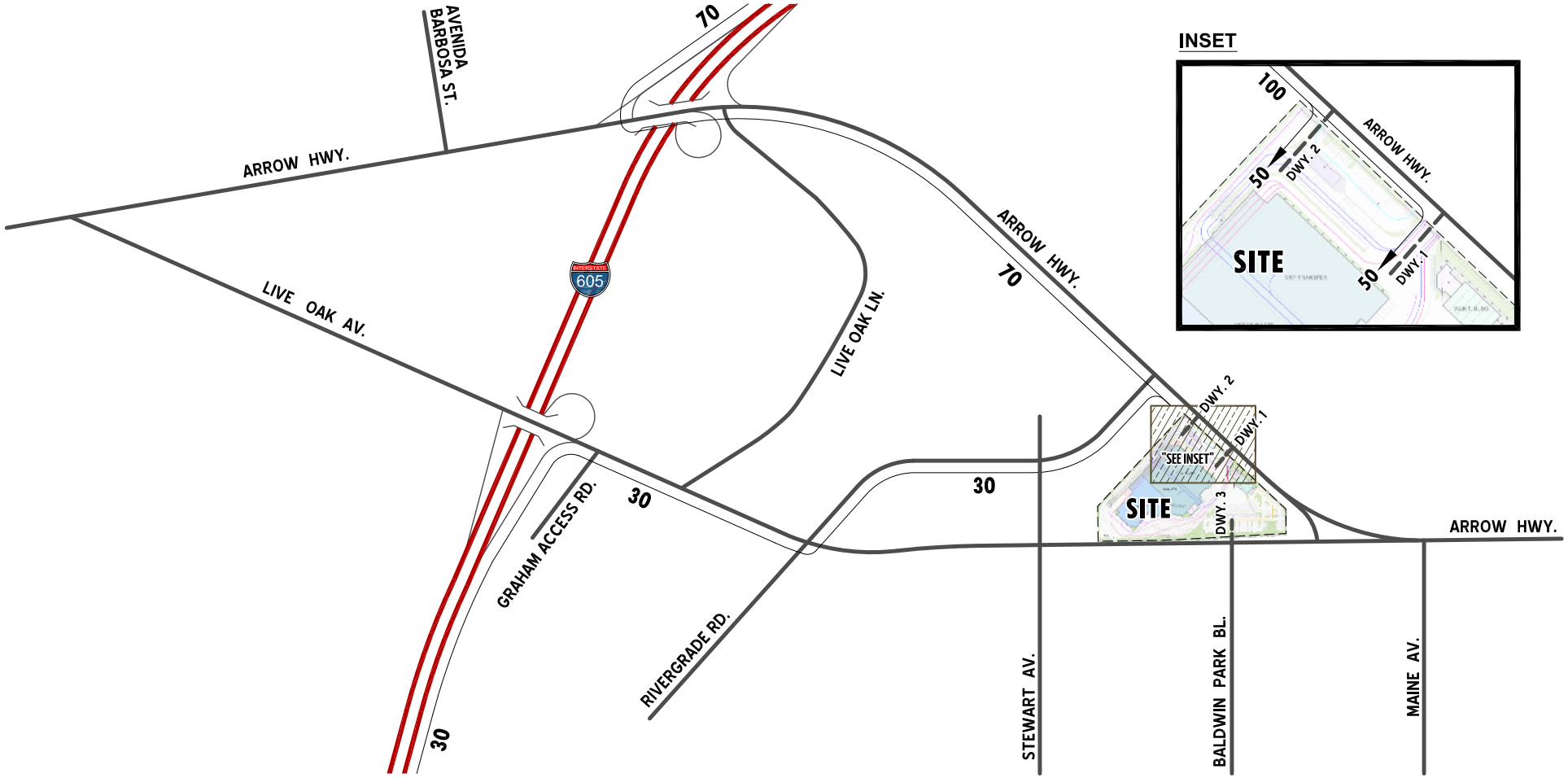
Exhibit 2-D presents the Transfer Trucks trip distribution patterns for the proposed project. The trip distribution anticipated for the Transfer Trucks represents the traffic pattern for trucks bringing materials out of the site to be transferred to compost facilities in Victorville or to the ports of Los Angeles and Long Beach for overseas shipping to recycling plants. Unrecoverable materials would be transported to one of several landfills in Los Angeles County, Riverside County, or Tulare County. Thirty percent (30%) of the Transfer Trucks are anticipated to travel to/from the south (via the I-605 Freeway) and 70% to/from the north (via the I-605 Freeway).

Exhibit 2-E presents the Employee trip distribution patterns for the proposed project. As shown on Exhibit 2-E, 30% of the proposed project's employee vehicles are anticipated to travel along the I-605 Freeway to the north and 30% to the south, and 10% to the east towards the northerly portions of Baldwin Park and the easterly portions of Irwindale. As also shown on Exhibit 2-E, 5% of employee traffic is expected to travel to the west along Live Oak Avenue, 5% along Rivergrade Road, 5% along Stewart Avenue and 10% along Baldwin Park Boulevard.

Exhibit 2-F presents the "Convenience Store / Fueling Facility" trip distribution patterns for the proposed project. As shown on Exhibit 2-F, 20% of the Convenience Store / Fueling Facility traffic is anticipated to be captured within the project site. The following summarizes the other trip distribution percentages for the Convenience Store / Fueling Facility:

- 5% to the north along the I-605 Freeway
- 5% to the north along Avenida Barbosa Street
- 5% to the west along Arrow Highway
- 5% to the south to/from the I-605 Freeway
- 5% along Rivergrade Avenue
- 15% within the industrial areas immediately west / northwest of the project site.
- 10% to / from Stewart Avenue
- 10% along Baldwin Park Boulevard
- 10% along Maine Avenue
- 10% to the east along Arrow Highway

TRANSFER & RECYCLABLE LOADOUT TRUCKS INBOUND TRIP DISTRIBUTION

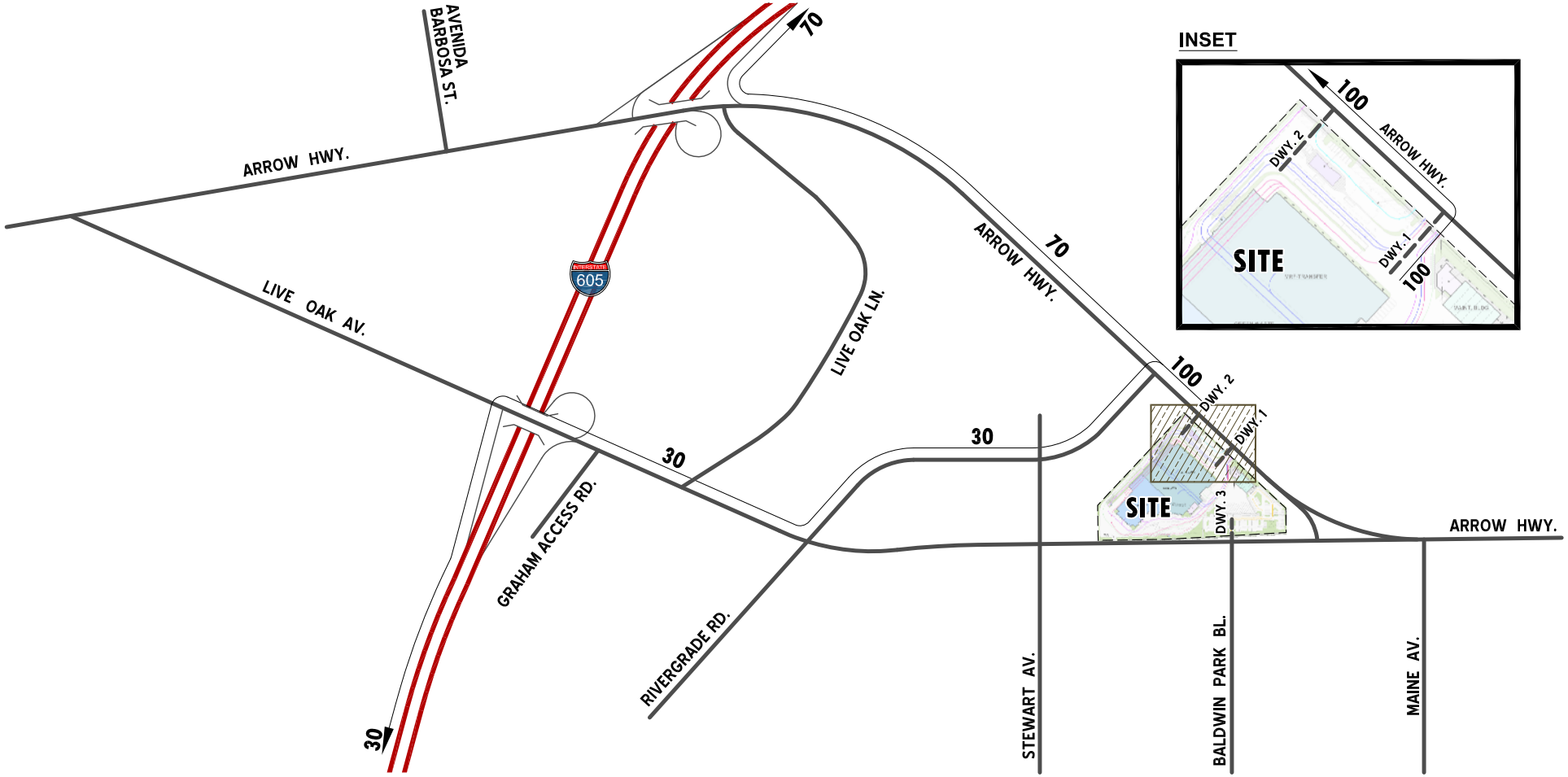


LEGEND:

10 = PERCENT TO PROJECT

N

TRANSFER & RECYCLABLE LOADOUT TRUCKS OUTBOUND TRIP DISTRIBUTION

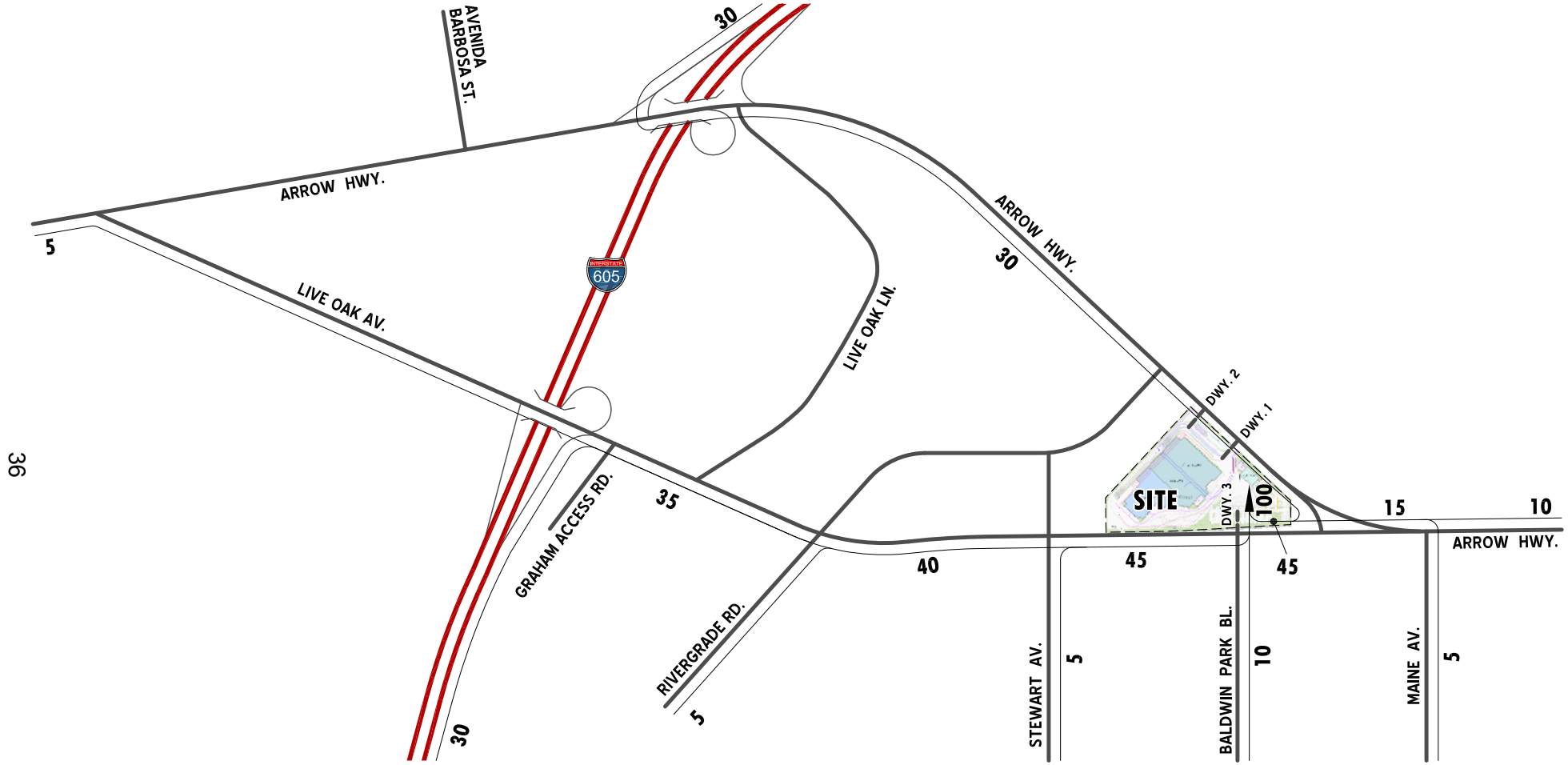


LEGEND:

10 = PERCENT FROM PROJECT

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EMPLOYEE (PASSENGER CAR) INBOUND TRIP DISTRIBUTION



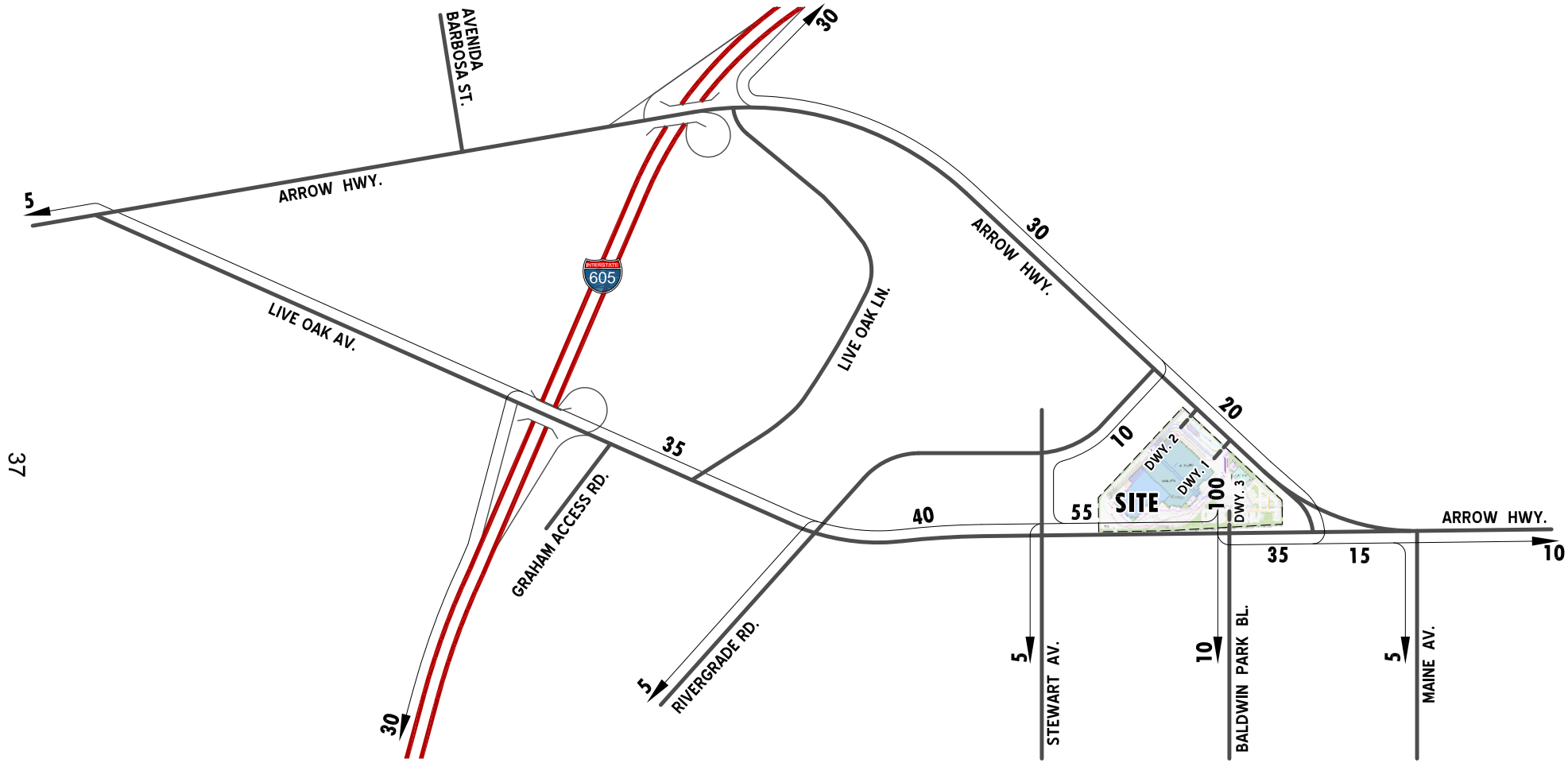
LEGEND:

10 = PERCENT TO PROJECT

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EXHIBIT 2-E (Page 2 of 2)

EMPLOYEE (PASSENGER CAR) OUTBOUND TRIP DISTRIBUTION



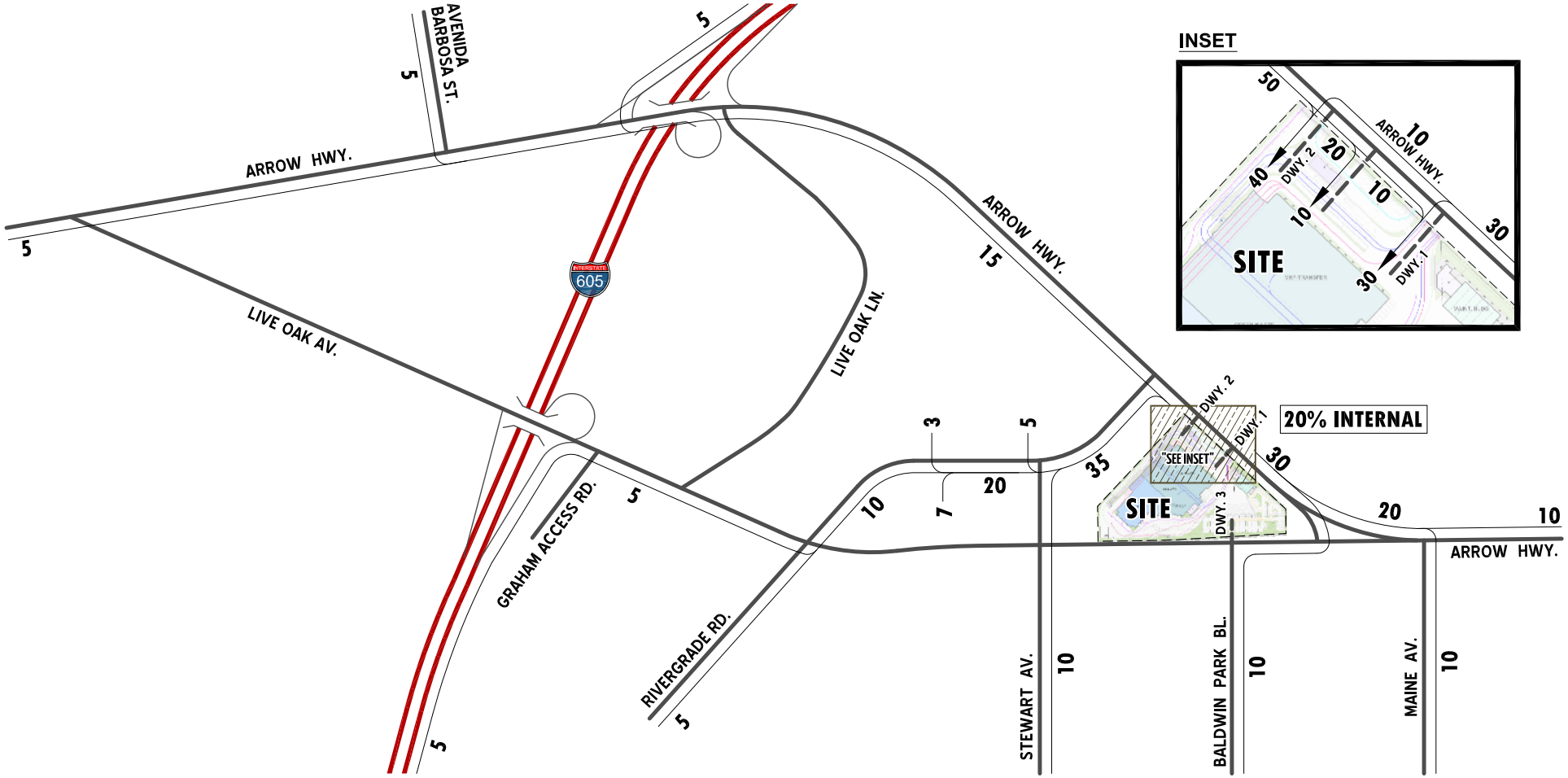
37

LEGEND:

10 = PERCENT FROM PROJECT

N

CONVENIENCE STORE/FUELING FACILITY
INBOUND TRIP DISTRIBUTION



LEGEND:

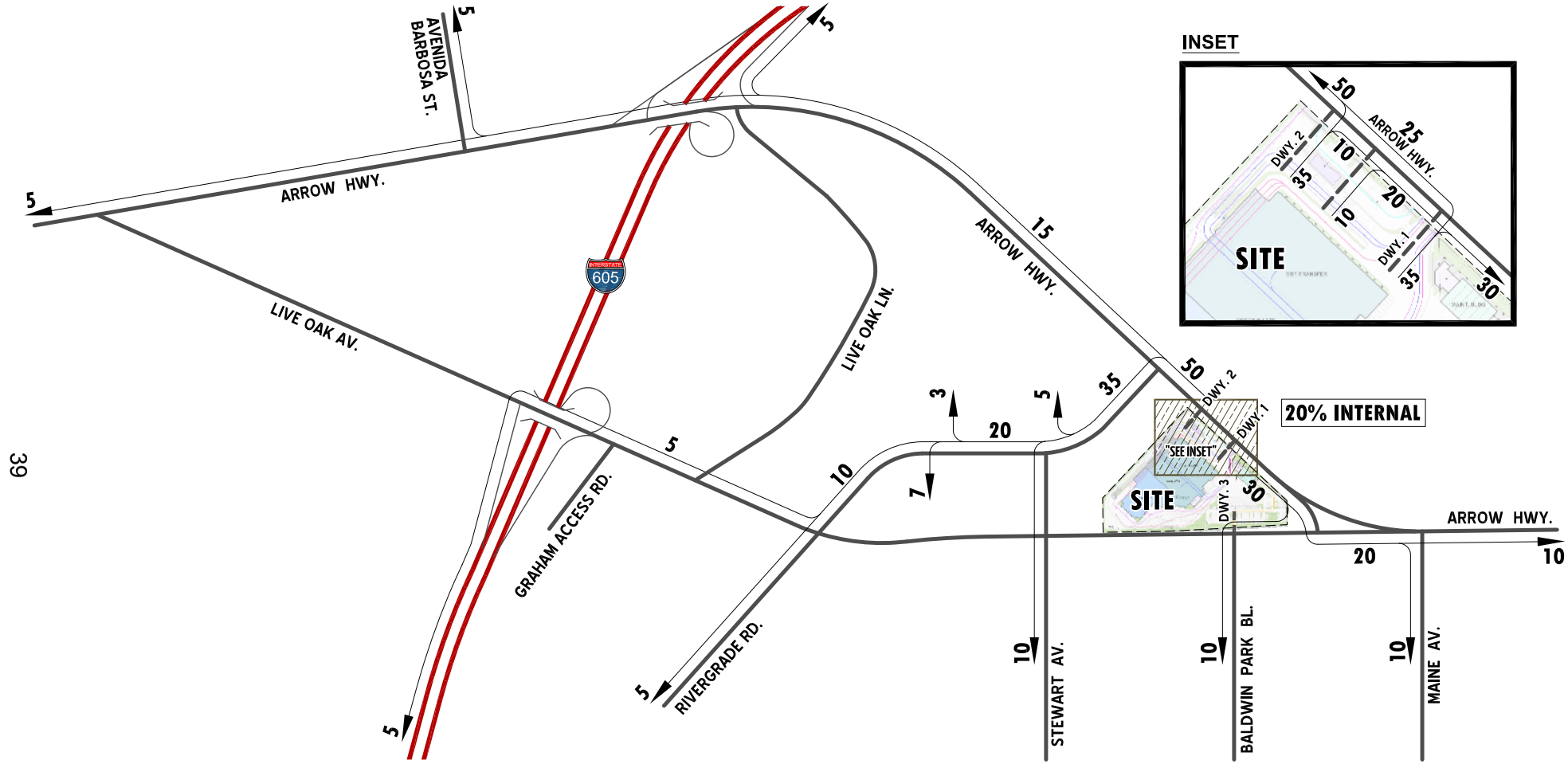
10 = PERCENT TO PROJECT

NOTE: TRIP DISTRIBUTION APPLIES TO ADDED TRIPS, NOT PASS-BY TRIPS WHICH ARE ALREADY ON THE ROADWAY SYSTEM.

N

EXHIBIT 2-F (Page 2 of 2)

CONVENIENCE STORE/FUELING FACILITY OUTBOUND TRIP DISTRIBUTION



LEGEND:

10 = PERCENT FROM PROJECT

NOTE: TRIP DISTRIBUTION APPLIES TO ADDED TRIPS, NOT PASS-BY TRIPS WHICH ARE ALREADY ON THE ROADWAY SYSTEM.

N

2.6 Project Trip Generation

Information on trip generation rates for the project's proposed use (i.e., solid waste transfer station) is not readily available in the Institute of Transportation Engineers (ITE) Trip Generation Informational Report (9th Edition). However, the trip generation (truck and employee passenger cars) for the proposed project has been calculated based on (1) data collected by Urban Crossroads, Inc. for similar existing land uses, and (2) Peak to daily relationships (for manufacturing type facilities) illustrated in the ITE Trip Generation Informational Report. The Convenience Store / Fueling Facility store's trip generation has been calculated via ITE trip generation rates. This facility will be open to the public.

Heavy vehicles, such as Collection Trucks and Transfer Trucks, occupy more space, and experience inferior performance when compared with passenger cars. Historically, the effect of heavy vehicles on traffic flow has been accounted for through the use of Passenger Car Equivalent (PCE) factors. These factors were developed to account for the effects of heavy vehicles when traffic is operating at free-flow conditions. However, the effect of heavy vehicles during congestion is significantly greater than that during free flow conditions. This is mainly due to the fact that the acceleration and deceleration cycles, a situation that is normally experienced during congestion or stop-and-go conditions, impose an extra limitation on the performance of heavy vehicles. With this in mind, a conservative PCE factor of 1.5 has been used for Self-Haul Trucks, 2.7 has been used for Collection Trucks and 3.7 for Transfer Trucks. These PCE values are consistent with numerous other Solid Waste Facility Permits (SWFP) available for review on the California Integrated Waste Management Board (CIWMB) website.

Empirical data collected by Urban Crossroads Inc. at various transfer station locations in southern California were considered in the development of project trip generation rates. The data is included as Attachment 1 within Appendix 1. Attachment 1 also includes calculations performed by Urban Crossroads, Inc. staff to evaluate trip generation patterns and develop trip generation rates for each truck type. The empirical data includes truck axle counts for facilities of various sizes, so the weighted average trip rate was calculated. Although the sample projects are not as large as the proposed Project, the application of derived trip rates to the Irwindale facility yields conservatively high estimates of travel activity associated with the site.

Table 2-1 summarizes the data utilized to calculate the proposed project's trip generation for the proposed project. Each employee is assumed to generate 2 trips per day (e.g., each employee drives individually and enters and exits the site once per day). This is a conservative approach, since many of the employees can be expected to carpool or use alternative modes of transport. At the same time, this conservative approach allows / accounts for incidental trips entering and exiting the site (visitors, etc.).

Table 2-1 and 2-2 present the project's trip generation. As shown on Table 2-2, the proposed project is anticipated to generate a net total of approximately 8,333 passenger car equivalent (PCE) trip-ends per day, with 664 AM peak hour trips and 664 PM peak hour trips.

2.7 Project Only Volumes

The project only related average daily traffic (ADT) volumes are shown on Exhibit 2-G. Similarly, Exhibit 2-H and Exhibit 2-I present the project only AM and PM peak hour volumes, respectively. As shown on these exhibits, Arrow Highway is projected to carry the most project related traffic with approximately 7,200 vehicles per day (vpd) immediately north of Driveway 2. Project only daily traffic contributions on Live Oak Avenue other locations along Arrow Highway between the project site and the I-605 Freeway would generally range between 300 and 4,200 vehicles (passenger car equivalents) per day.

"Project only" peak hour 2-way (link) traffic volumes are presented on Exhibit 2-J. As shown on Exhibit 2-J, the project is anticipated to generate the most peak hour trips along Arrow Highway immediately north of Driveway 2. A substantial amount of project related traffic is also anticipated to travel along Live Oak Avenue, east of the I-605 Freeway. The 327 AM and 308 PM trips along Arrow Highway is reflective of the truck trips related to cities located north of the project site and of the landfill transfer truck trips destined towards the City of Victorville, the Sunshine Canyon Landfill, the Chiquita Canyon Sanitary Landfill, and Central Valley Landfill (Tulare County). By comparing Exhibit 2-J and Exhibit ES-B (intersection analysis location map), all major intersections projected to carry 50 (or more) peak hour trips have been evaluated in this traffic study.

TABLE 2-1
PROJECT TRIP GENERATION RATES

LAND USE	UNIT[1]	AM PEAK HOUR			PM PEAK HOUR			DAILY
		IN	OUT	TOTAL	IN	OUT	TOTAL	
Truck Trips - 2-axle[2]	Site TPD	0.002	0.003	0.005	0.002	0.002	0.004	0.041
Truck Trips - 3-axle[2]	Site TPD	0.008	0.009	0.017	0.013	0.010	0.024	0.275
Truck Trips - 4-axle[2]	Site TPD	0.004	0.004	0.008	0.002	0.002	0.004	0.093
Employees (Passenger Cars)[3]	EMP	0.274	0.102	0.376	0.149	0.189	0.338	2.000
Convenience Store (ITE LU 853)	TSF	20.46	20.46	40.92	25.46	25.46	50.92	845.60

[1] Site TPD = Tons Per Day for entire site - Appendix A shows empirical data calculations used to develop trip rates; EMP = Employees; TSF = Thousand Square Feet

[2] Daily and peak hour quantities have been obtained from empirical data for similar uses, applied to the site maximum processing of 6,000TPD.

[3] Daily quantities assume 2 trips / employee. AM and PM peak hour to daily relationships have been based on ITE Land Use Code "140 EMP" (Manufacturing)

TABLE 2-2
PROJECT BUILDOUT (2016) TRIP GENERATION SUMMARY

LAND USE	COMMODITY DIRECTION	QUANTITY	UNIT[1]	AM PEAK HOUR IN	AM PEAK HOUR OUT	AM PEAK HOUR TOTAL	PM PEAK HOUR IN	PM PEAK HOUR OUT	PM PEAK HOUR TOTAL	DAILY
Self-Haul Trucks (525 TPD)[2] - 2-axle	INBOUND	6,000	Site TPD	12	19	31	12	12	24	249
Packer Trucks (3,812 TPD)[2] - 3-axle	*INBOUND*	*6,000*	*Site TPD*	*33*	*37*	*70*	*54*	*43*	*97*	*1,137*
End Dump Trucks (250 TPD)[2] - 3-axle	*INBOUND*	*6,000*	*Site TPD*	*2*	*2*	*4*	*3*	*3*	*6*	*66*
Roll-Off Trucks (1,496 TPD)[2] - Collection & Transfer - 3-axle	*IN / OUT*	*6,000*	*Site TPD*	*13*	*14*	*27*	*21*	*17*	*38*	*445*
Total 3-axle	IN / OUT	6,000	Site TPD	48	53	101	78	63	141	1,648
Transfer Trucks incl. Recyclable Loadout (5,918 TPD)[2] - 4-axle	OUTBOUND	6,000	Site TPD	24	24	48	9	14	23	559
NET TRUCK TRIPS:				**84**	**96**	**180**	**99**	**89**	**188**	**2,456**
Self-Haul Trucks (PCE = Truck x 1.5)				*18*	*29*	*47*	*18*	*18*	*36*	*374*
Collection (Packer and End Dump) and all Roll-Off Trucks (PCE = Truck x 2.7)				*130*	*143*	*273*	*211*	*170*	*381*	*4,450*
Transfer Trucks (PCE = Truck x 3.7)				*89*	*89*	*178*	*33*	*52*	*85*	*2,068*
NET TRUCK TRIPS (PCE):				**237**	**261**	**498**	**262**	**240**	**502**	**6,892**
Employees (Total of 345 Employees daily)[3]				95	35	130	51	65	117	690
Transfer Station Subtotal (PCE)[5]				***332***	***296***	***628***	***313***	***305***	***619***	***7,582***
Convenience Market W/Pumps		2.4	TSF	49	49	98	61	61	122	2,029
- Pass by (63%)[4]				*-31*	*-31*	*-62*	*-38*	*-38*	*-77*	*-1,279*
Convenience Market W/Pumps Subtotal				***18***	***18***	***36***	***23***	***23***	***45***	***751***
TOTAL PROJECT TRIPS (PCE)[5]				**350**	**314**	**664**	**336**	**328**	**664**	**8,333**

[1] Site TPD = Tons Per Day for entire site - Appendix A shows empirical data calculations used to develop trip rates; EMP = Employees; TSF = Thousand Square Feet

[2] Daily and peak hour rates obtained from empirical data for similar uses, are applied to the site maximum processing of 6,000TPD. 3-axle trip gen by truck type is factored based on TPD for each type.

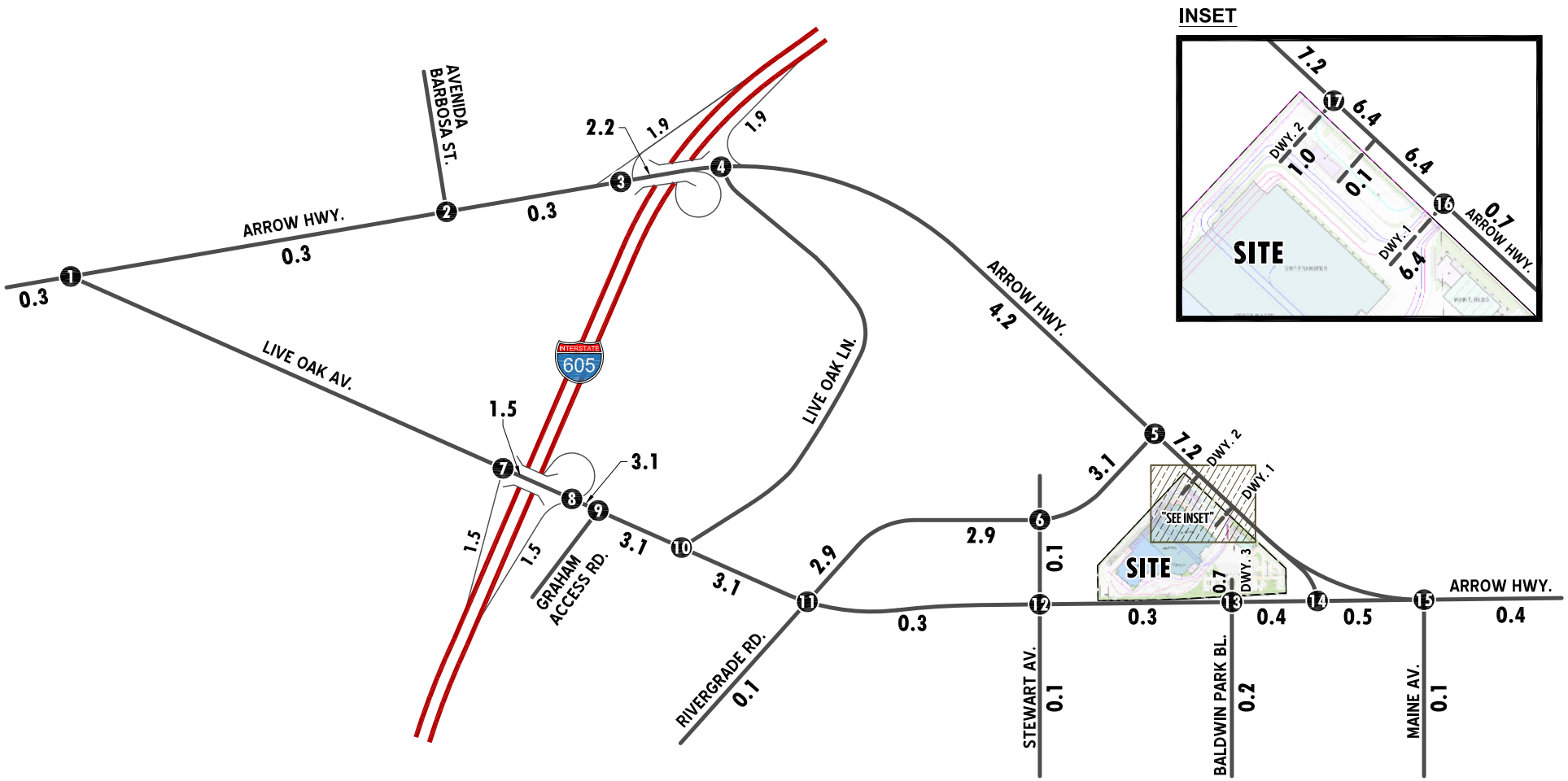
[3] Daily quantities assume 2 trips / employee. AM and PM peak hour to daily relationships have been based on ITE Land Use Code "140 EMP" (Manufacturing)

[4] Pass by % is based on Table 5-12 from the ITE Trip Generation Handbook 2nd Edition (2004)

[5] TOTAL TRIPS (PCE) = Net Truck Trips (PCE) + Employees + Convenience Market W/Pumps.

EXHIBIT 2-G

PROJECT AVERAGE DAILY TRAFFIC (ADT)



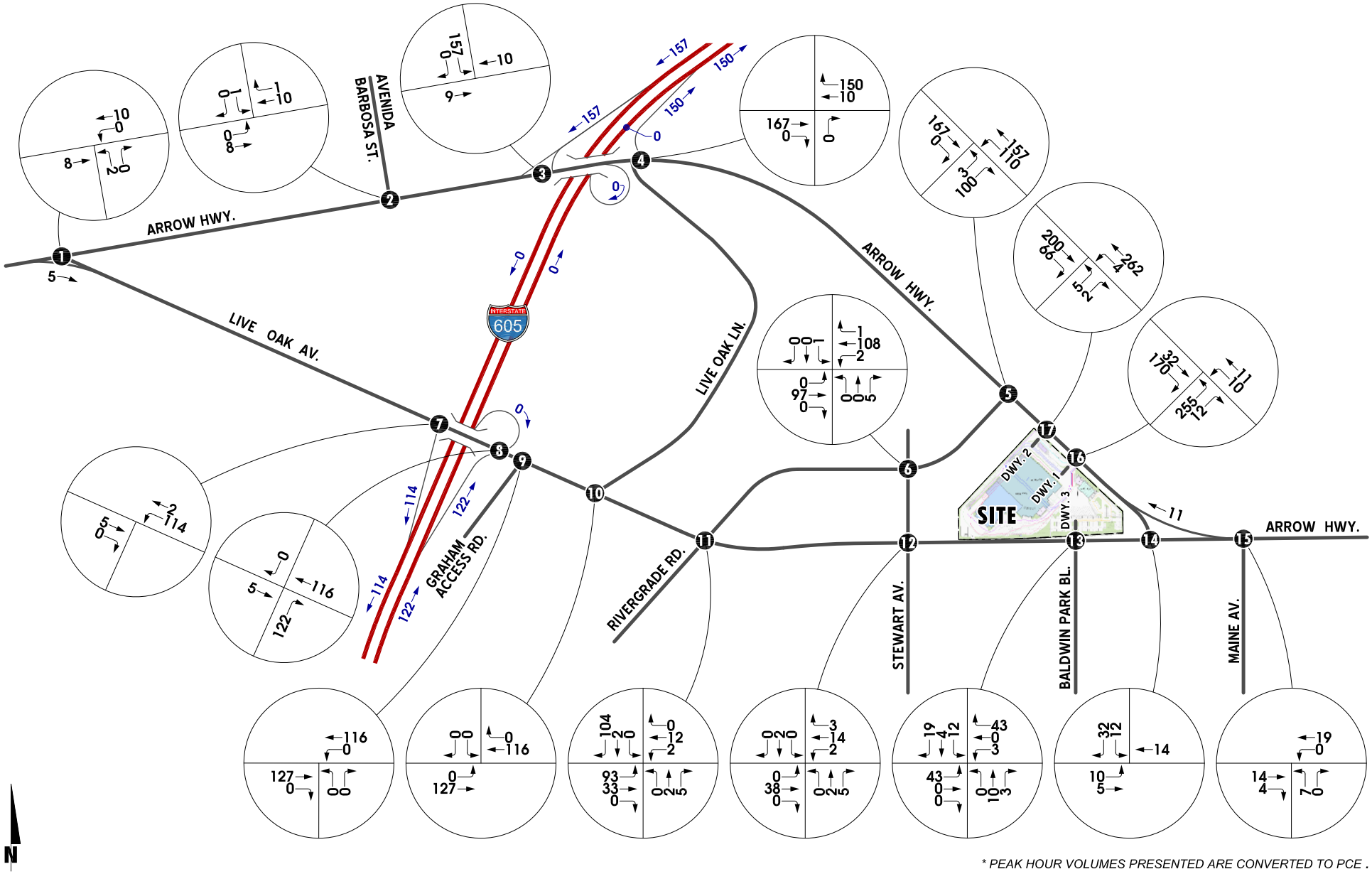
LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 2-H

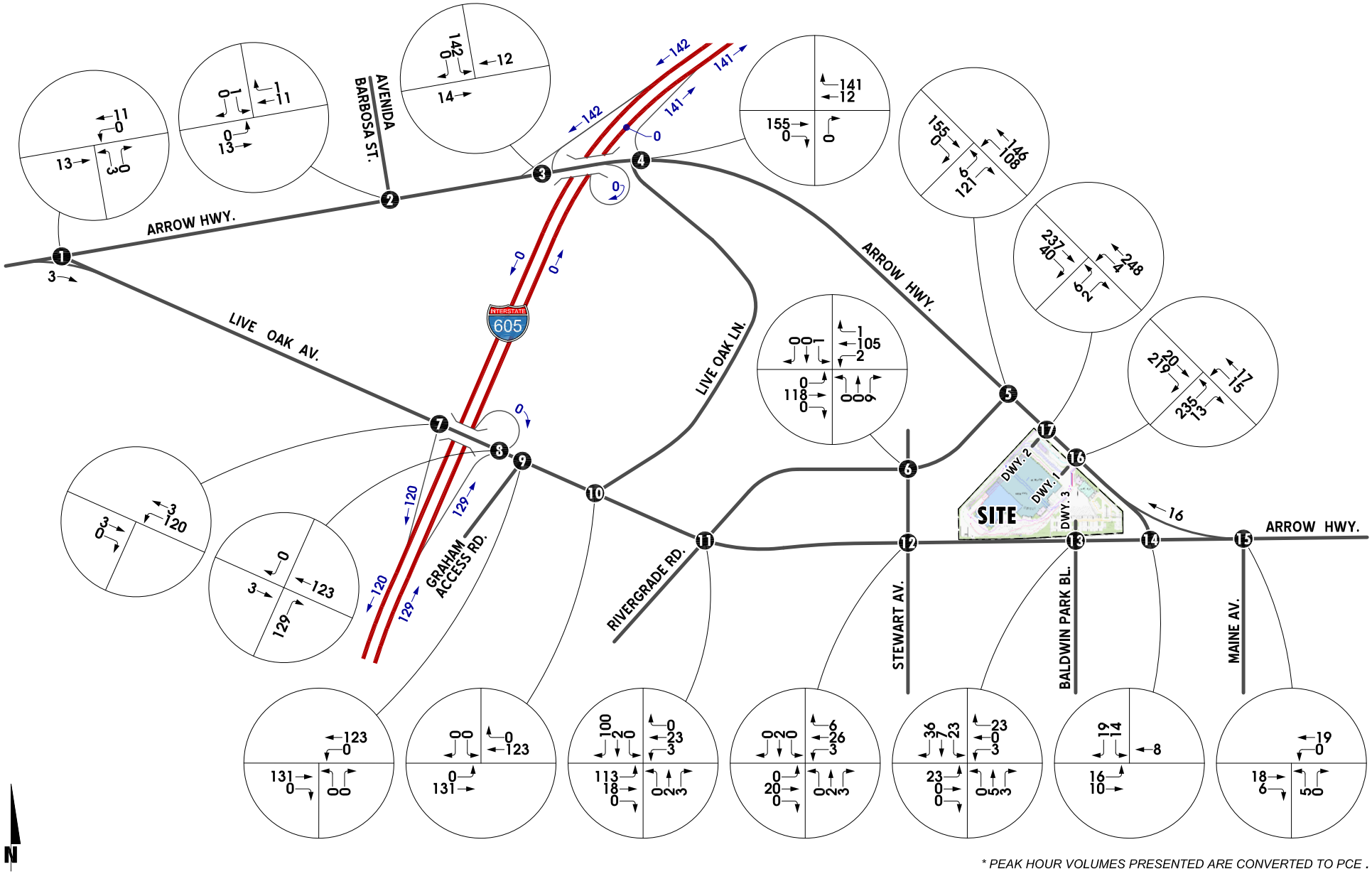
PROJECT AM PEAK HOUR INTERSECTION VOLUMES



* PEAK HOUR VOLUMES PRESENTED ARE CONVERTED TO PCE .

EXHIBIT 2-I

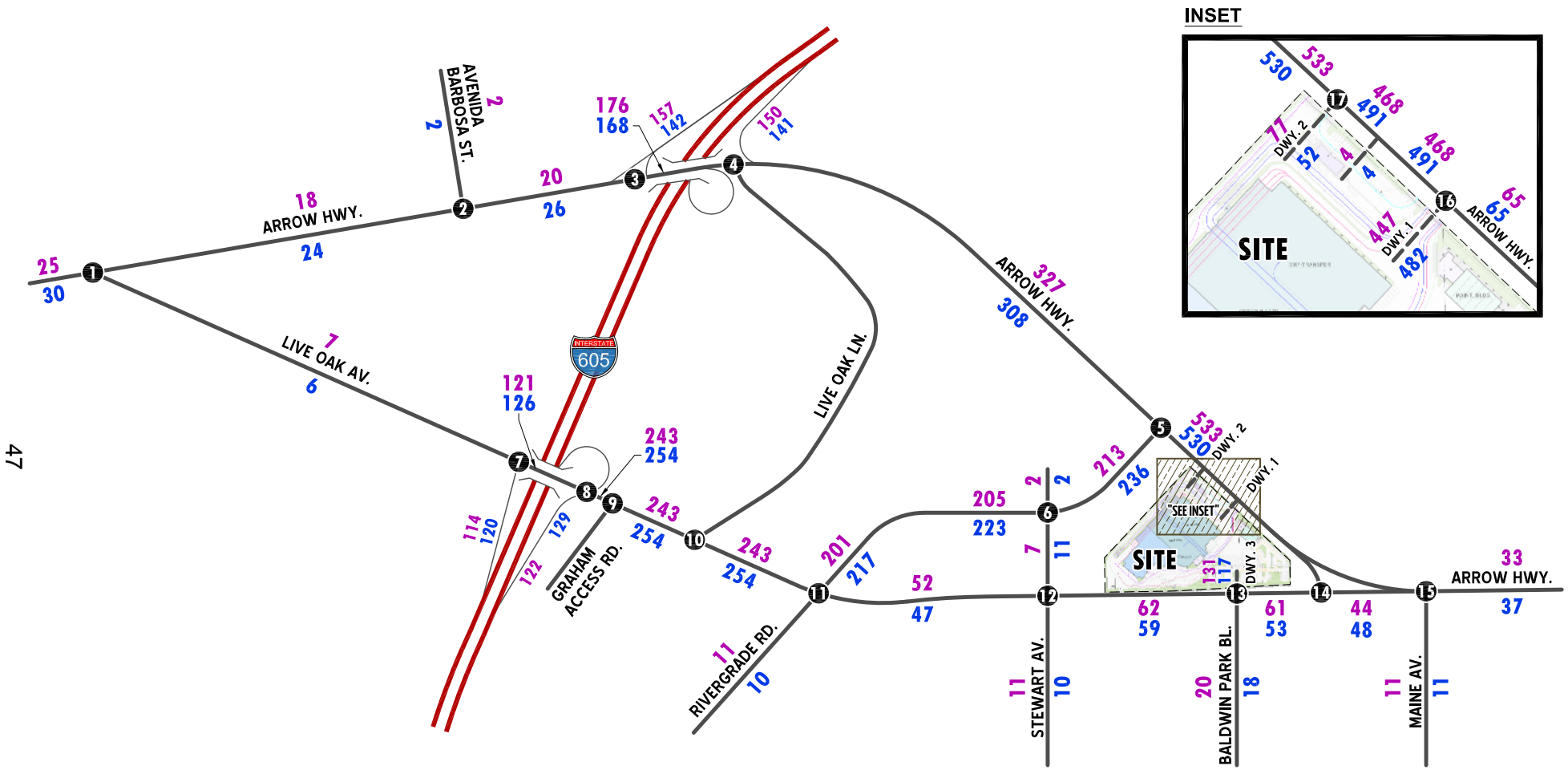
PROJECT PM PEAK HOUR INTERSECTION VOLUMES



* PEAK HOUR VOLUMES PRESENTED ARE CONVERTED TO PCE .

EXHIBIT 2-J

PROJECT ONLY PEAK HOUR LINK VOLUMES



LEGEND:

100 = PROJECT ONLY AM PEAK HOUR
LINK (2-WAY) VOLUMES, PASSENGER CAR EQUIVALENTS (PCE)

100 = PROJECT ONLY PM PEAK HOUR
LINK (2-WAY) VOLUMES, PASSENGER CAR EQUIVALENTS (PCE)

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3.0 AREA CONDITIONS

This section of the report summarizes existing roadway and traffic conditions in the study area. All major intersections anticipated to carry 50 (or more) peak hour trips (passenger car equivalents) have been evaluated in this traffic study. The existing number of lanes and traffic control devices for existing intersections are presented, along with existing traffic count data collected for this study. This data was used to analyze existing traffic operations in the study area. Existing plans for roadway improvements are also described in this section.

3.1 Existing Roadway System Circulation Network

The study area includes a total of seventeen (17) existing and future intersections as shown on Exhibit ES-B. Of these seventeen (17) intersections, the existing study area circulation network includes fifteen (15) intersections analysis locations shown on Table ES-1. The other two (2) intersections in the study area are future planned intersections (Project driveways) that do not currently exist.

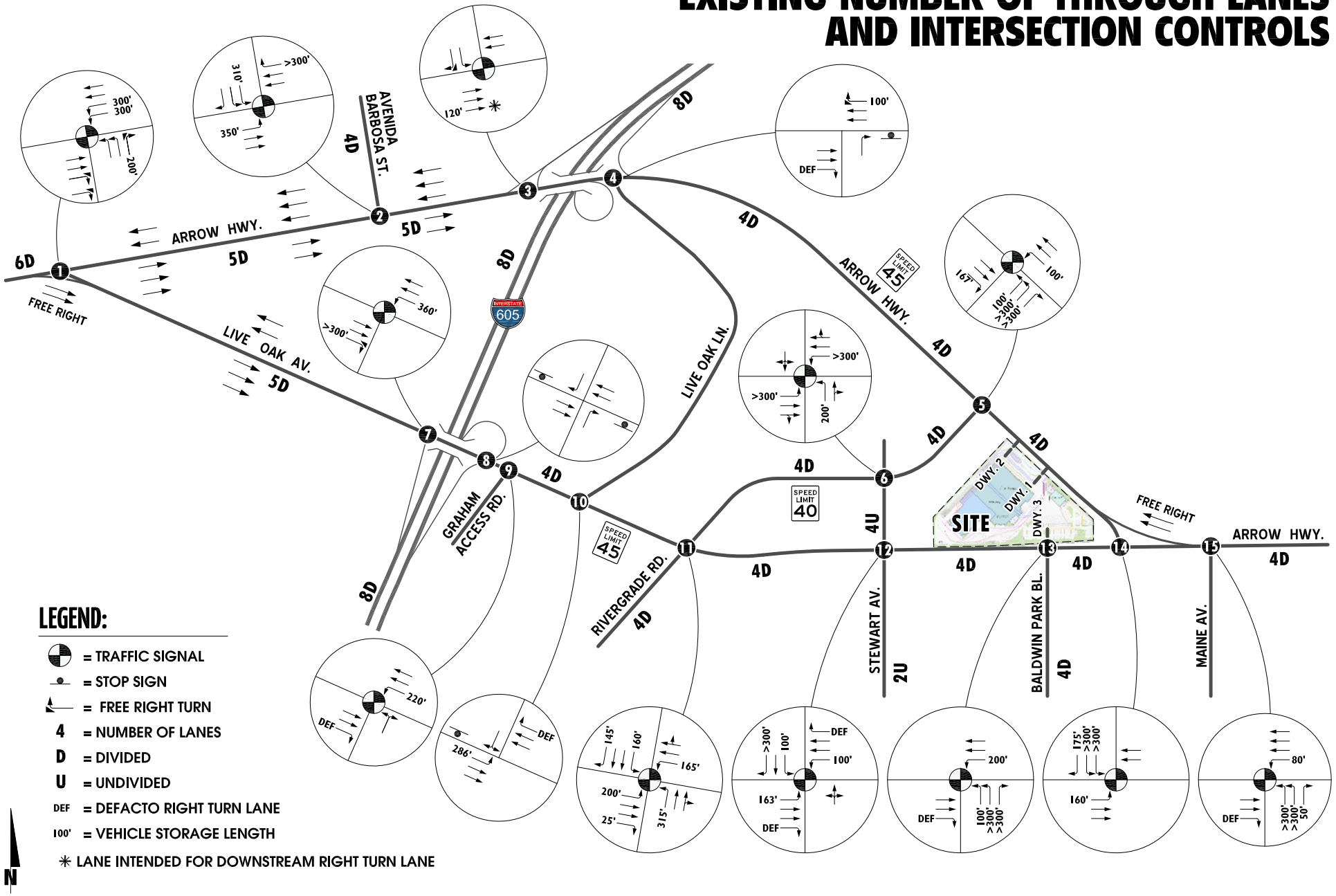
Exhibit 3-A identifies the existing number of through lanes and intersection controls for the study area roadways. As shown on Exhibit 3-A, Arrow Highway and Live Oak Avenue exist today as four (4) lane divided roadways east of the I-605 Freeway. The speed limit on both Arrow Highway and Live Oak Avenue is currently 45 mile per hour (mph). The majority of existing land uses east of the I-605 Freeway, south of Arrow Highway (and north of Live Oak Avenue) are currently industrial. Rivergrade Road and Stewart Avenue (between Live Oak Avenue and Arrow Highway) are primarily utilized by trucks to the industrial uses that serve this area of Irwindale. As also shown on Exhibit 3-A, all of the existing study area intersections immediately adjacent to the project site are signalized. The only existing unsignalized intersections evaluated in this traffic study are the I-605 Freeway Northbound Ramps and Live Oak Lane (private industrial road) intersections along Live Oak Avenue and Arrow Highway.

3.2 Transit Service

The study area is currently served by the Foothill Transit Agency with bus service along Live Oak Avenue via Route 492 and Arrow Highway via Route 272. Portions of Live Oak

EXHIBIT 3-A

EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



Avenue, within the study area, is also served by the Baldwin Park Transit Agency via Teal Line route.

Exhibit 3-B illustrates the Foothill Transit Agency bus routes for the study area.

3.3 Existing Pedestrian and Bicycle Facilities

Existing pedestrian and bicycle facilities (e.g., crosswalks, sidewalks, bike lanes, etc.) within the study area are shown on Exhibit 3-C. As shown in Exhibit 3-C, the only existing bike path within the study area is located on the riverbed.

3.4 Existing Daily Traffic Volumes

Exhibit 3-D depicts the current average daily traffic (ADT) volumes in the study area. The existing data shown on Exhibit 3-D has been based on January and May 2013 traffic data (see Appendix "B"). The traffic count data was collected while school was in session and after the completion of the roadway improvements along Arrow Highway.

As shown on Exhibit 3-D, the highest daily traffic volumes in the study area occur on Arrow Highway, east of Maine Avenue, which currently carries approximately 34,500 vehicles per day (VPD). West of Arrow Highway (North), Live Oak Avenue carries approximately 33,600 VPD.

3.5 Existing Peak Hour Traffic Volumes

Existing intersection level of service calculations are based upon manual AM and PM peak period turning movement counts conducted on June 2011, and adjusted for 2013 conditions based upon 24-hour roadway segment counts. Turning Movement traffic count worksheets are included in Appendix "C". The AM peak hour traffic volumes were determined by counting the two hour period between 7 - 9 AM in the morning. Similarly, the PM peak hour traffic volumes were identified by counting the two hour period from 4 - 6 PM in the evening. The highest four consecutive 15-minute periods traffic counts have

EXHIBIT 3-B

EXISTING TRANSIT SERVICES



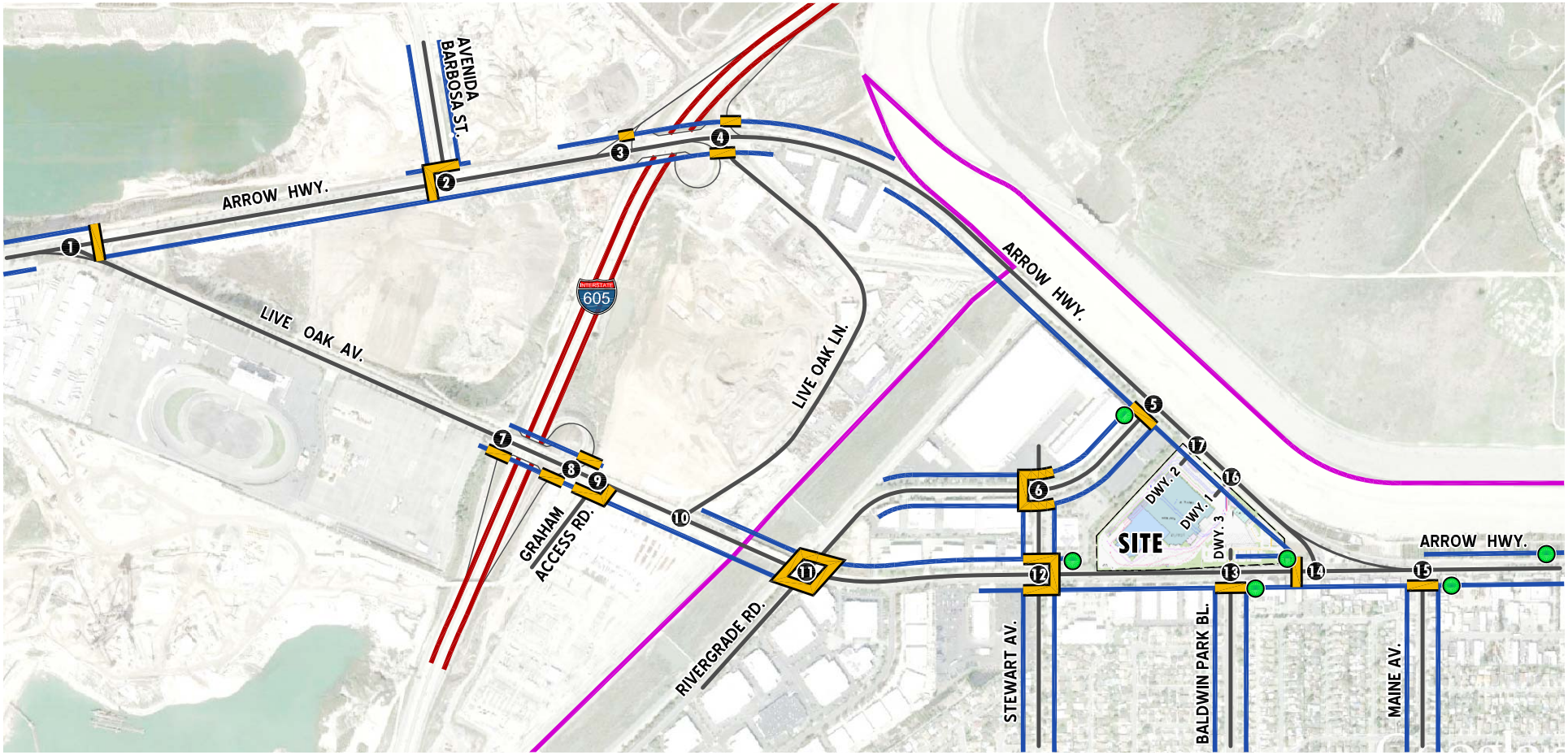
LEGEND:

- 17 = INTERSECTION ID
- = FOOTHILL TRANSIT ROUTE 272
- = FOOTHILL TRANSIT ROUTE 492
- = BUS STOP

N

EXHIBIT 3-C

EXISTING PEDESTRIAN AND BICYCLE FACILITIES



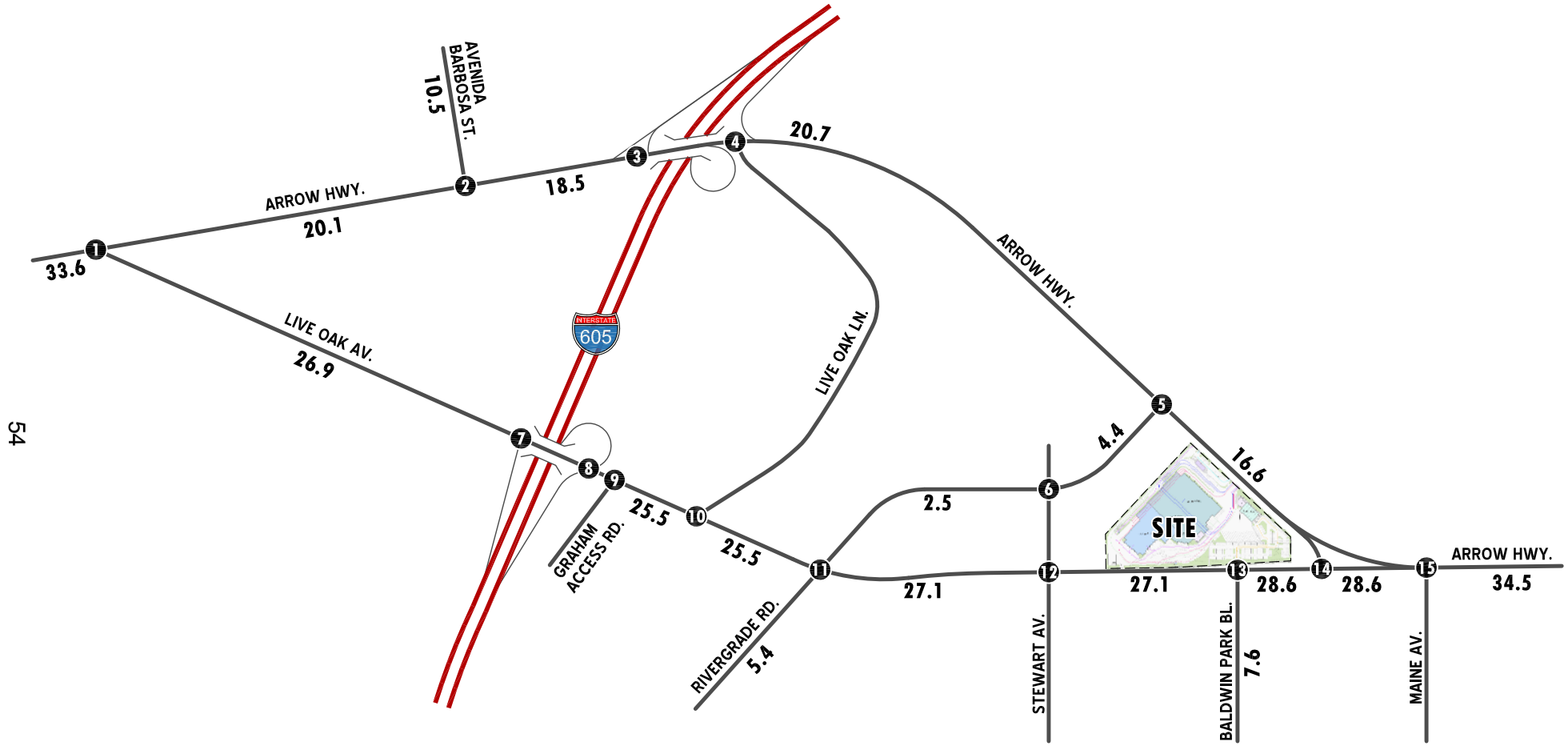
LEGEND:

- 17 = INTERSECTION ID
- = BUS STOP
- = BIKE PATH
- = SIDEWALK
- = CROSSWALK

N

EXHIBIT 3-D

EXISTING (2013) AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

been used for analysis. The count includes the vehicle classification as shown below per the City of Irwindale traffic study guidelines:

- passenger cars
- buses/recreational vehicles
- 3 axle trucks
- 4 or more axle trucks

The overall existing count volumes illustrated on the exhibits and used for the analysis for the study are calculated passenger car equivalent (PCE) volumes. These raw PCE volumes are then reviewed for flow conservation between closely spaced intersections and adjusted to ensure reasonable flow conservation if necessary was also performed.

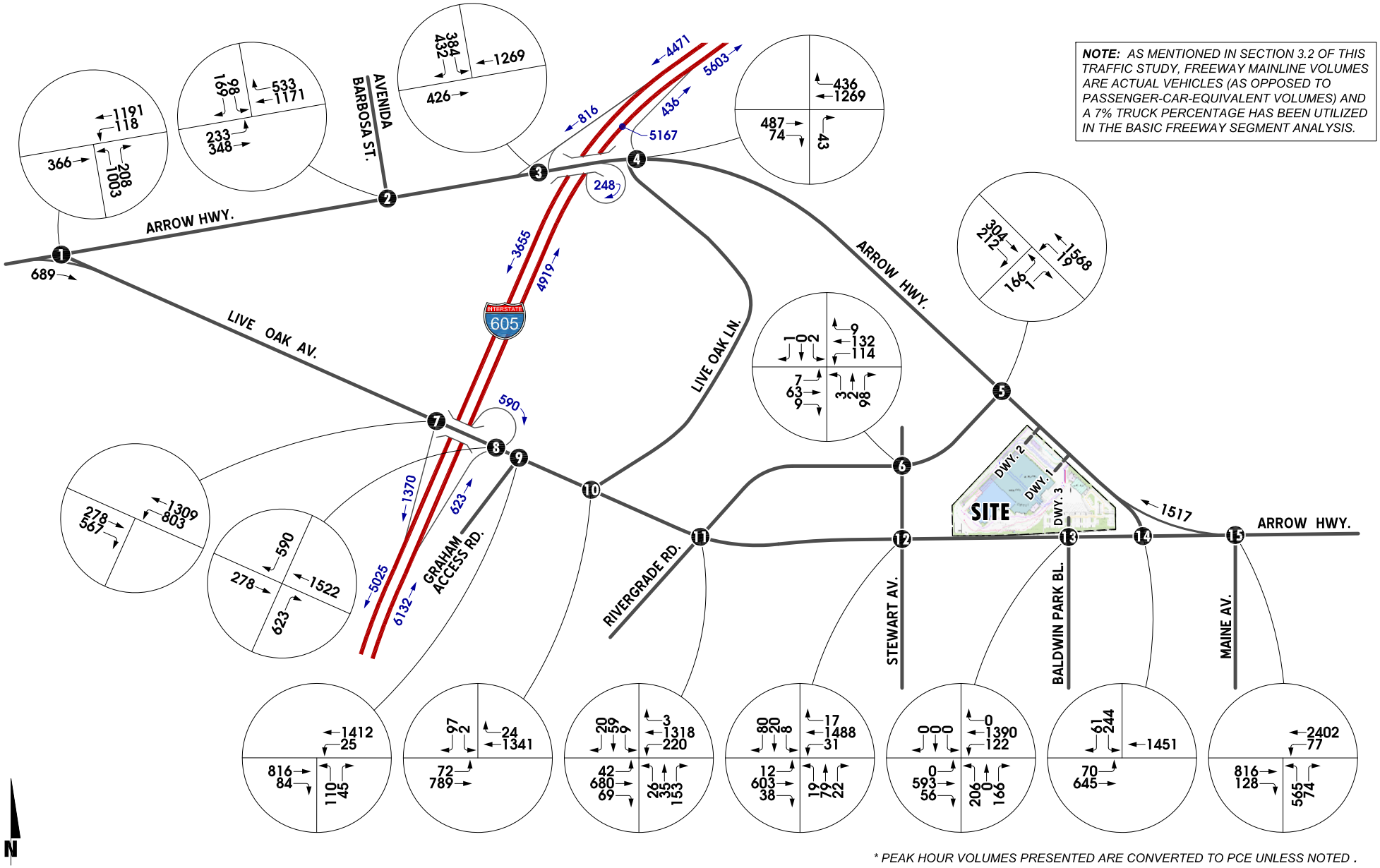
In addition, link volume F comparison between 2011 and 2013 counts indicates a 1.018 growth factor (equivalent to 1.8%) during the AM peak hour growth. However, the PM peak hour comparison presents a decrease in traffic (approximately -4.0%) between 2011 and 2013 counts. Therefore, a final adjustment of 1.018 growth is applied to the 2011 AM peak hour volumes only and 2011 PM peak hour counts were utilized as is to reflect 2013 conditions. 2011 and 2013 Link volume growth comparison results are included in Appendix "C".

The final Existing (2013) AM and PM Peak hour volumes are shown on Exhibit 3-E and Exhibit 3-F, respectively.

The I-605 and I-210 Freeway mainline volume data were obtained from the Caltrans Performance Measurement System (PeMS) website for the purposes of this analysis. Freeway mainline peak hour volumes have been obtained for the week of May 14th through 16th, 2013 and have been flow conserved with freeway-ramp-to-arterial peak hour count data conducted during these same dates. In an effort to conduct a conservative analysis, the maximum value observed within the three (3) day period was utilized for the morning (AM) and evening (PM) peak hours. Therefore, the Caltrans

EXHIBIT 3-E

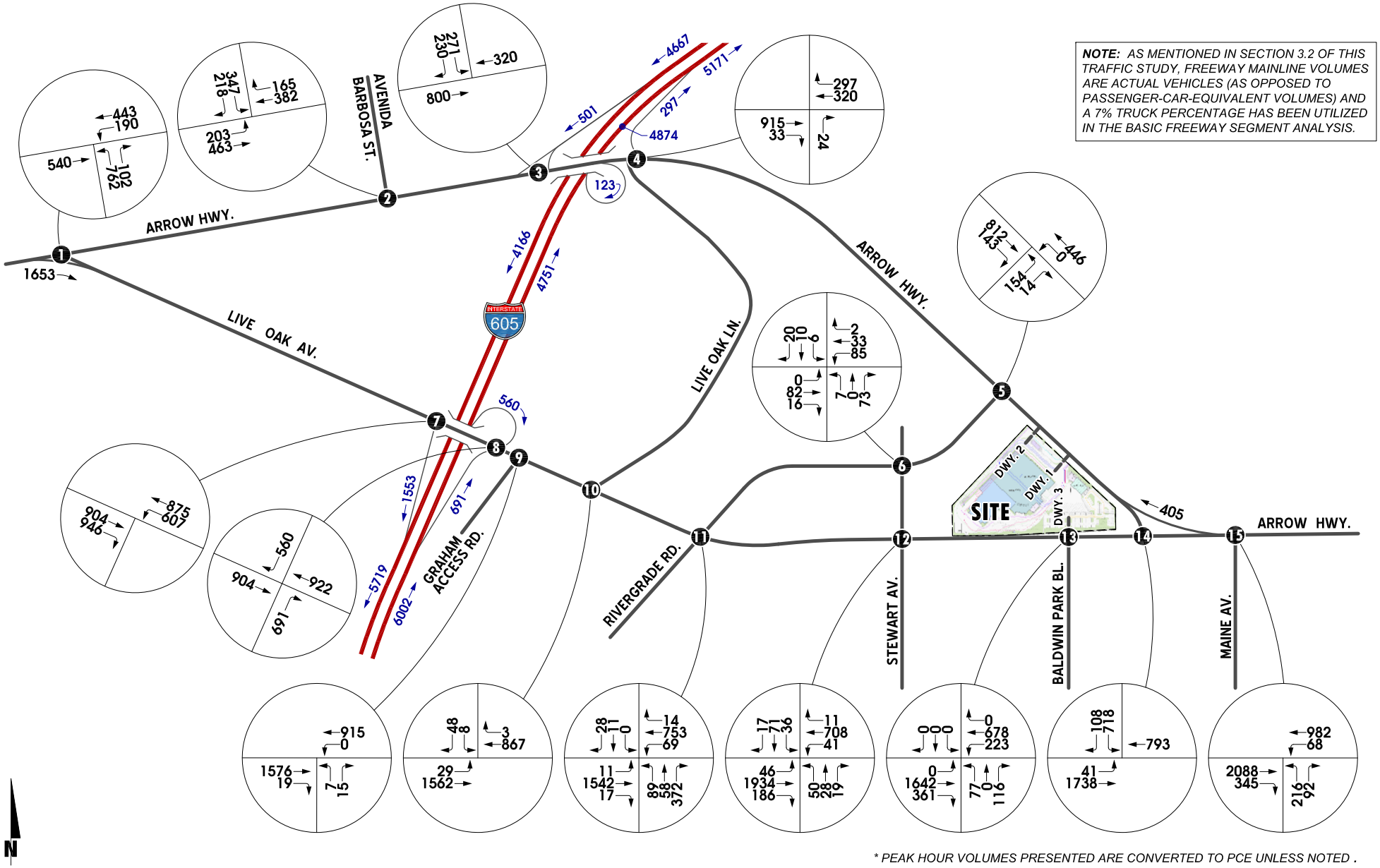
EXISTING (2013) AM PEAK HOUR INTERSECTION VOLUMES



* PEAK HOUR VOLUMES PRESENTED ARE CONVERTED TO PCE UNLESS NOTED .

EXHIBIT 3-F

EXISTING (2013) PM PEAK HOUR INTERSECTION VOLUMES



* PEAK HOUR VOLUMES PRESENTED ARE CONVERTED TO PCE UNLESS NOTED .

2011 Annual Average Daily Truck Traffic on the California State Highway System is utilized which presents a 6.79% truck percentage along the I-605 freeway and 6.93% truck percentage along I-210 within the study area. For the purpose of this analysis, actual vehicles (as opposed to passenger-car-equivalent volumes) and a parameter of 7% (rounded value) truck percentage have been utilized for the calculation of the basic freeway segment analysis. The source data and freeway volume summary is included as Appendix "D" to this report.

The Existing (2013) freeway mainline directional volumes for the AM and PM peak hours are also provided on Exhibit 3-E and Exhibit 3-F, respectively.

For freeway ramp facilities, passenger car equivalent volumes have been used. The freeway on/off ramp AM and PM peak hour volumes are also provided on Exhibit 3-E and Exhibit 3-F, respectively.

3.6 Existing (2013) Traffic Conditions

The existing conditions analyses include intersection delay and queuing analyses for surface ramp intersections; mainline analysis for freeway segments; and merge/diverge analyses for ramp exits and entrances. The analysis methodologies were described previously in Section 1.

3.6.1 Existing Intersection Delay Analysis

Existing (2013) peak hour traffic operations have been evaluated for study area intersections. The results of this analysis are summarized in Table 3-1, along with the existing intersection geometrics and traffic control devices at each analysis location. The supporting HCM delay and ICU calculation worksheets are provided as Appendix "E".

TABLE 3-1

EXISTING (2013) CONDITIONS
INTERSECTIONS ANALYSIS SUMMARY

#	INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	NORTH-BOUND T	NORTH-BOUND R	SOUTH-BOUND L	SOUTH-BOUND T	SOUTH-BOUND R	EAST-BOUND L	EAST-BOUND T	EAST-BOUND R	WEST-BOUND L	WEST-BOUND T	WEST-BOUND R	HCM DELAY[2] (SECS.) AM	HCM DELAY[2] (SECS.) PM	HCM LEVEL OF SERVICE[2] AM	HCM LEVEL OF SERVICE[2] PM	ICU[6] (V/C) AM	ICU[6] (V/C) PM	ICU[6] LEVEL OF SERVICE AM	ICU[6] LEVEL OF SERVICE PM
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	19.5	24.2	B	C	0.74	0.50	C	A
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	1	18.2	22.7	B	C	0.65	0.44	B	A
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	12.4	8.4	B	A	0.78	0.41	C	A
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.1	10.3	B	B	NA	NA	NA	NA
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)	TS	1	2	0	0	2	1	2	0	1	0	0	0	5.9	6.7	A	A	0.56	0.32	A	A
6	Stewart Av. (NS) / Rivergrade Rd. (EW)	TS	1	1	0	0	1	0	1	2	0	1	2	0	7.3	9.8	A	A	0.11	0.11	A	A
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	8.4	11.0	A	B	0.76	0.78	C	C
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)[4]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	17.6	15.0	C	B	NA	NA	NA	NA
	-NB Slip Off-Ramp to Live Oak Av. Eastbound[5]	CSS	0	0	1	--	--	--	0	2	0	0	2	0	14.4	31.5	B	D	NA	NA	NA	NA
	-NB loop Off-Ramp to Live Oak Av. Westbound[5]	CSS	--	--	--	0	0	1	0	2	0	0	2	0	**74.8**	43.9	**F**	**E**	NA	NA	NA	NA
9	Graham Access Rd. (NS) / Live Oak Av. (EW)	TS	0	1	0	0	0	0	0	2	d	1	2	0	5.9	2.1	A	A	0.59	0.56	A	A
10	Live Oak Ln. (NS) / Live Oak Av. (EW)	CSS	0	0	0	0	1	0	1	2	0	0	2	d	12.2	14.0	B	B	NA	NA	NA	NA
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)	TS	1	2	0	1	2	1	1	2	1	1	2	d	17.6	17.2	B	B	0.62	0.74	B	C
12	Stewart Av. (NS) / Live Oak Av. (EW)	TS	0	1	0	1	1	1	1	2	d	1	2	d	8.8	11.9	A	B	0.58	0.75	A	C
13	Baldwin Park Bl. - Dwy. 3 (NS) / Live Oak Av. (EW)	TS	2	0	1	0	0	0	0	2	d	1	2	0	11.2	16.5	B	B	0.55	0.75	A	C
14	Arrow Hwy. (NS) / Live Oak Av. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	7.0	22.1	A	C	0.53	0.81	A	D
15	Maine Av. (NS) / Arrow Hwy. (EW)	TS	2	0	1	0	0	0	0	2	d	1	3	0	14.4	19.0	B	B	0.73	0.75	C	C
16	Arrow Hwy. (NS) / Dwy. 1 (EW)	-	DOES NOT EXIST												-	-	-	-	-	-	-	-
17	Arrow Hwy. (NS) / Dwy. 2 (EW)	-	DOES NOT EXIST												-	-	-	-	-	-	-	-

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width (23') for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; 1>> = Free Right Turn Lane; d = Defacto Right Turn Lane

[2] Delay and level of service (LOS) calculated using the following analysis software: Synchro 8. Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown. "NA" value is shown for unsignalized ICU values.

[3] TS = Traffic Signal; CSS = Cross Street Stop.

[4] LOS based on average delay (unsignalized intersection).

[5] LOS based on minor approach operating condition (unsignalized intersection).

[6] The Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information.

* **BOLD** = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

For Existing (2013) conditions, the following study area intersection currently operates at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Intersection Location	Jurisdiction
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

3.6.2 Existing Freeway Mainline Analysis

The Existing (2013) freeway mainline analysis results are presented on Table 3-2. The freeway mainline analysis calculation worksheets for Existing (2013) conditions are included in Appendix "F". As shown on Table 3-2, the freeway segments analyzed for this study were found to operate at an acceptable LOS (i.e., LOS "D" or better) during the peak hours with the existing 4-lanes in each direction.

3.6.3 Freeway Ramp Analysis

The Existing (2013) freeway ramp analysis results are presented on Table 3-3. The ramp analysis calculation worksheets for Existing (2013) conditions are included in Appendix "F". As shown on Table 3-3, the freeway on / off ramps analyzed for this study were found to operate at an acceptable LOS (i.e., LOS "D" or better) during the peak hours with the existing single lane on / off ramps.

3.6.4 Existing Intersection Queuing Analysis

Based on the Synchro plus SimTraffic 8 simulation summarized in Table 3-4, the vehicular queues appear to clear in a reasonable and timely fashion throughout the network under Existing (2013) traffic conditions, with the exception of the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue. Appendix "F" includes the queuing analysis worksheets.

TABLE 3-2

EXISTING (2013) CONDITIONS
BASIC FREEWAY SEGMENT ANALYSIS

FREEWAY	DIRECTION	MAINLINE SEGMENT LOCATION	Lanes[1]	VOLUME		DENSITY[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	Immediately South of Live Oak Avenue	4	6,132	6,002	25.1	24.5	C	C
		Between Live Oak Avenue and Eastbound Arrow Highway Loop On Ramp	4	4,919	4,751	19.8	19.1	C	C
		Between Eastbound Arrow Highway Loop On Ramp and Westbound Arrow Highway On Ramp	4	5,167	4,874	20.8	19.6	C	C
		Immediately North of Westbound Arrow Highway On Ramp	4	5,603	5,171	22.7	20.8	C	C
	SB	Immediately North of Arrow Highway Off Ramps	4	4,471	4,667	18.0	18.8	B	C
		Between Arrow Highway Off Ramps and Live Oak On Ramps	4	3,655	4,166	14.7	16.7	B	B
		Immediately South of Live Oak On Ramps	4	5,025	5,719	20.2	23.2	C	C
I-210 FREEWAY	WB	Immediately East of Irwindale Avenue Westbound Off Ramp	4	6,961	7,043	29.8	30.4	D	D
		Between Irwindale Avenue Westbound Loop On Ramp and Irwindale Avenue Westbound Off Ramp	4	6,362	6,520	26.3	27.2	D	D
		Immediately West of Irwindale Avenue Westbound On Ramp	4	7,363	7,251	32.7	31.8	D	D
	EB	Immediately West of Irwindale Avenue Eastbound Off Ramp	4	7,500	7,158	33.7	31.2	D	D
		Between Irwindale Avenue Eastbound Off Ramp and Irwindale Avenue Eastbound OnRamp	4	5,961	6,336	24.3	26.2	C	D
		Immediately East of Irwindale Avenue Eastbound Off Ramp	4	6,446	7,235	26.8	31.7	D	D

[1] Number of lanes are in the specified direction and is based on existing conditions.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+: Basic Freeway Segments software, Version 5.21

TABLE 3-3

EXISTING (2013) CONDITIONS
FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS

FREEWAY	DIRECTION	RAMP LOCATION	Lanes on Freeway[1]	VOLUME		DENSITY [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	NB Off Ramp at Live Oak Avenue	4	1,213	1,251	34.2	33.8	D	D
		NB Loop On Ramp for Eastbound Arrow Highway	4	248	123	20.6	19.8	C	B
		NB Direct On Ramp for Westbound Arrow Highway	4	436	297	22.5	20.8	C	C
	SB	SB Off Ramp at Arrow Highway	4	816	501	25.3	24.5	C	C
		SB On Ramp at Live Oak Avenue	4	1,370	1,553	24.8	28.1	C	D
I-210 FREEWAY	WB	WB Off Ramp at Irwindale Avenue	4	599	523	33.2	33.1	D	D
		WB Loop On Ramp at Irwindale Avenue	4	540	448	29.0	28.8	D	D
		WB Direct On Ramp at Irwindale Avenue	4	461	283	29.0	27.9	D	C
	EB	EB Off Ramp at Irwindale Avenue	4	1,539	822	22.1	20.3	C	C
		EB On Ramp at Irwindale Avenue	4	485	899	26.6	29.2	C	D

[1] Existing conditions for all study area merge/diverge locations consists of single lane on/off ramps.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+ : Ramps and Ramp Junction software, Version 5.21

TABLE 3-4

EXISTING (2013) CONDITIONS
INTERSECTION QUEUING ANALYSIS SUMMARY[1]

ID	Intersection	Turning Movement Lane	Existing Storage Length[2] (feet)	Minimum Recommended Storage Length[3] (feet)	95th Percentile Queue Length Per Lane (feet)		Acceptable?[4]	
					AM	PM	AM	PM
3	I-605 SB Off-Ramp (NS) /							
	Arrow Hwy. (EW)	SBL	980	-	232 [5]	150	YES	YES
		SBR	1,060	-	0	0	YES	YES
		EBT	1,300	-	46	87	YES	YES
		WBT	1,160	-	273	54	YES	YES
7	I-605 SB On-Ramp (NS) /							
	Live Oak Av. (EW)	EBT	1,200	-	70	274 [5]	YES	YES
		EBR	670	-	0	0	YES	YES
		WBL	350	525	504 [5]	267	NO	YES
		WBT	545	-	0	0	YES	YES
8	I-605 NB Off-Ramp (NS) /							
	Live Oak Av. (EW)							
	- EBR on Live Oak Av. [6]	NBR	835	-	147	555	YES	YES
	- WBR on Live Oak Av. [6]	SBR Loop	1,560	-	456	448	YES	YES
		EBT	545	-	0	0	YES	YES
	- NWT [6]	WBT	545	-	0	98	YES	YES

[1] Queue length calculated using Synchro 8 with SimTraffic.

[2] Existing pocket length storage (for turning movements) or link distance (for through movements).

[3] Minimum recommended storage length needed to accommodate the anticipated 95th percentile queues.

[4] Storage Length is acceptable if the required queuing length is less than or equal to the storage length provided.

[5] 95th percentile volume exceeds capacity, queue may be longer.

[6] Synchro worksheet lane group movement reference

3.6.5 Existing Traffic Signal Warrant Analysis

Traffic signal warrant analysis has been performed for key unsignalized intersections that may require improvements to address anticipated future deficiencies. The only intersection meeting this criteria is the I-605 Freeway Northbound Off-Ramp (NS) at Live Oak Avenue (EW). The traffic signal warrant analysis worksheet is included in Appendix "G" of the report. Other unsignalized intersections are right turn only locations and are anticipated to operate at acceptable levels of service for the foreseeable future.

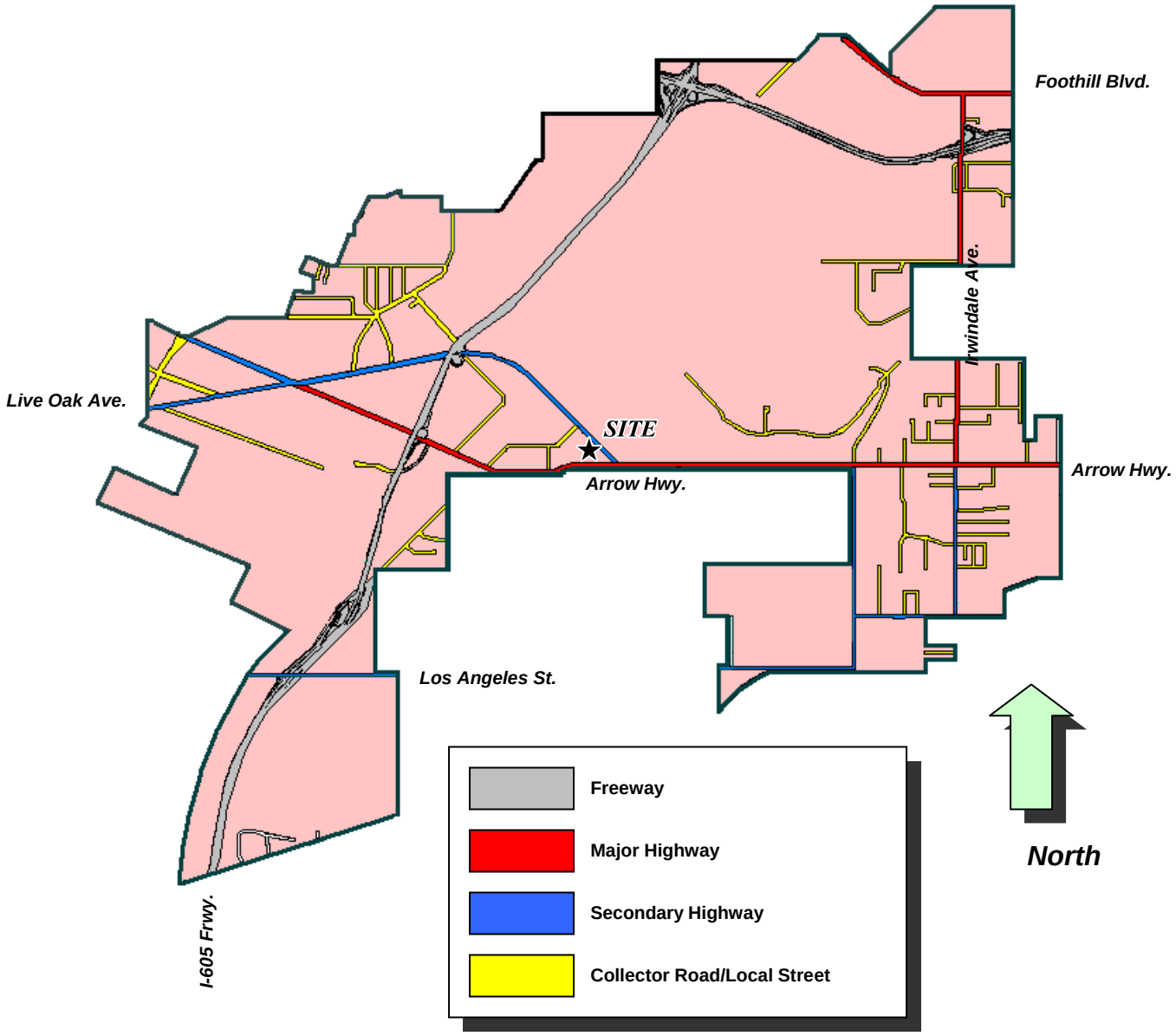
3.7 Planned Transportation Improvements and Relationships to General Plan

The City of Irwindale roadway classifications and typical roadway cross-sections are illustrated on Exhibit 3-G and Exhibit 3-H, respectively. These exhibits show the nature of the roadways in the vicinity of the proposed site and how access will be provided to the surrounding areas. As shown on Exhibits 3-G and 3-H, Live Oak Avenue is classified as a Major Highway with 100 feet right-of-way (ROW) and typical curb to curb pavement width of 84 feet. As also shown on Exhibits 3-G, Arrow Highway is a Secondary Highway immediately east of the I-605 Freeway and north of Live Oak Avenue with a right-of-way (ROW) of 80 feet and typical curb to curb pavement width of 64 feet. Arrow Highway is classified as a Major Highway immediately east of the project site (as Live Oak Avenue transitions to Arrow Highway) to the City of Irwindale easterly boundaries. Per the City of Irwindale General Plan Roadway Cross-Sections (Exhibit 3-H), Major Highways are 4 to 6 lane divided facilities.

The County of Los Angeles roadway classifications and typical roadway cross-sections are illustrated on Exhibit 3-I and 3-J, respectively. As shown on Exhibit 3-I, Live Oak Avenue and Arrow Highway are both classified as Major Highways in the study area. Similar to the City of Irwindale's roadway classification standards, the County of Los Angeles identifies a Major Highway with 100 feet right-of-way (ROW) and a typical curb to curb pavement width of 84 feet.

EXHIBIT 3-G

CITY OF IRWINDALE
GENERAL PLAN CIRCULATION ELEMENT



N

EXHIBIT 3-H

CITY OF IRWINDALE
GENERAL PLAN ROADWAY CROSS-SECTIONS

Table 4-10 Roadway Classification Standards				
	Major Highways	**Secondary Highways**	**Collector Roads**	**Local Streets**
Travel Lanes	4-6 (divided)	2-4 lanes (Undivided)	2 lanes	2 lanes
Estimated Daily Capacity	40,400 to 53,000 vehicles/day	10,000 to 30,000 vehicles/day	Up to 10,000 vehicles/day	2,000 or less vehicles/day
ROW width	100 ft.	80 ft.	60 ft.	60 ft.
Pavement Width	84 ft.	64 ft.	40 ft.	40 ft.
Note: Estimated daily capacity for LOS expressed in vehicles/day				

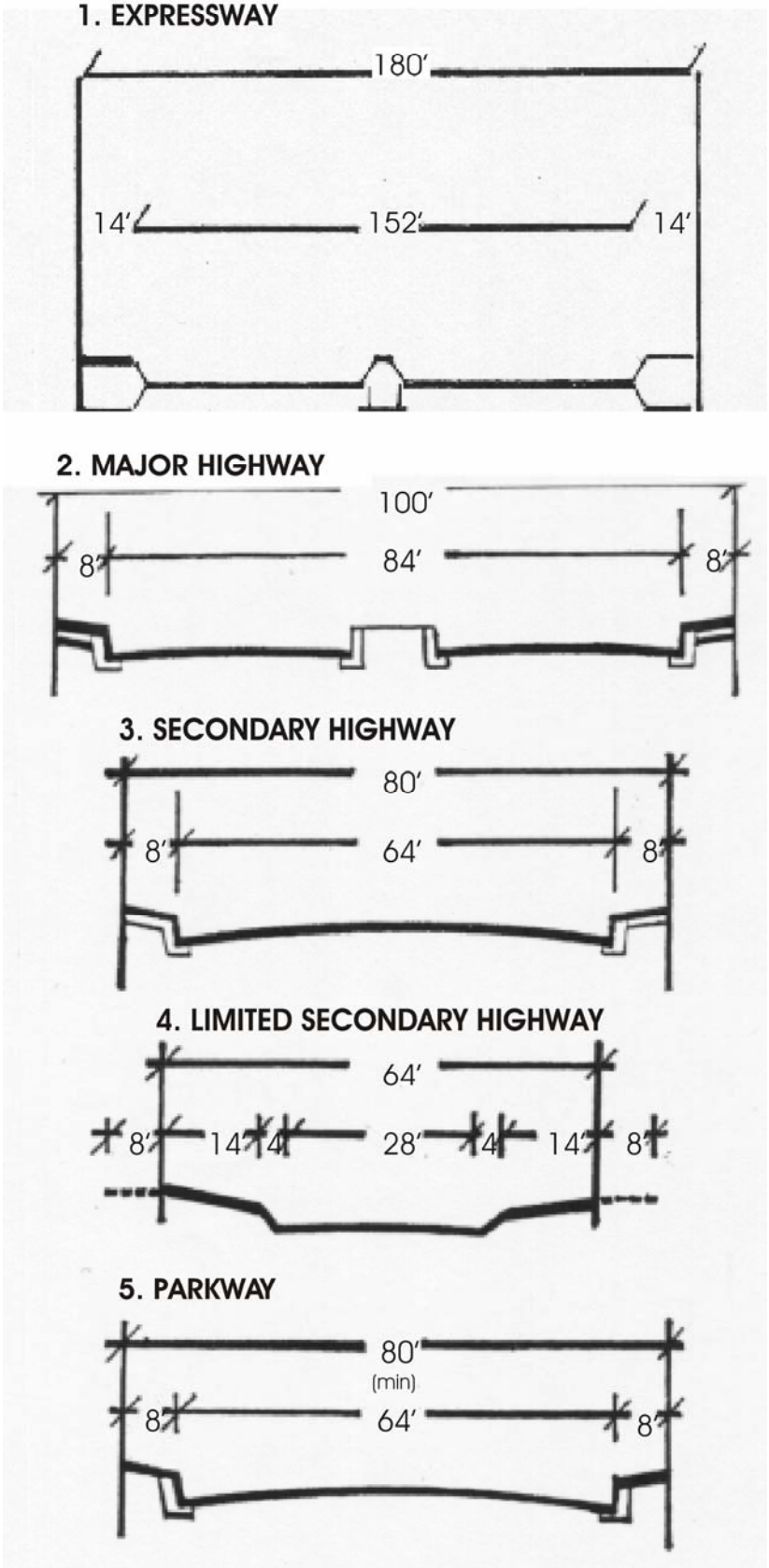
EXHIBIT 3-I

COUNTY OF LOS ANGELES
GENERAL PLAN CIRCULATION ELEMENT



EXHIBIT 3-J

COUNTY OF LOS ANGELES
GENERAL PLAN ROADWAY CROSS-SECTIONS

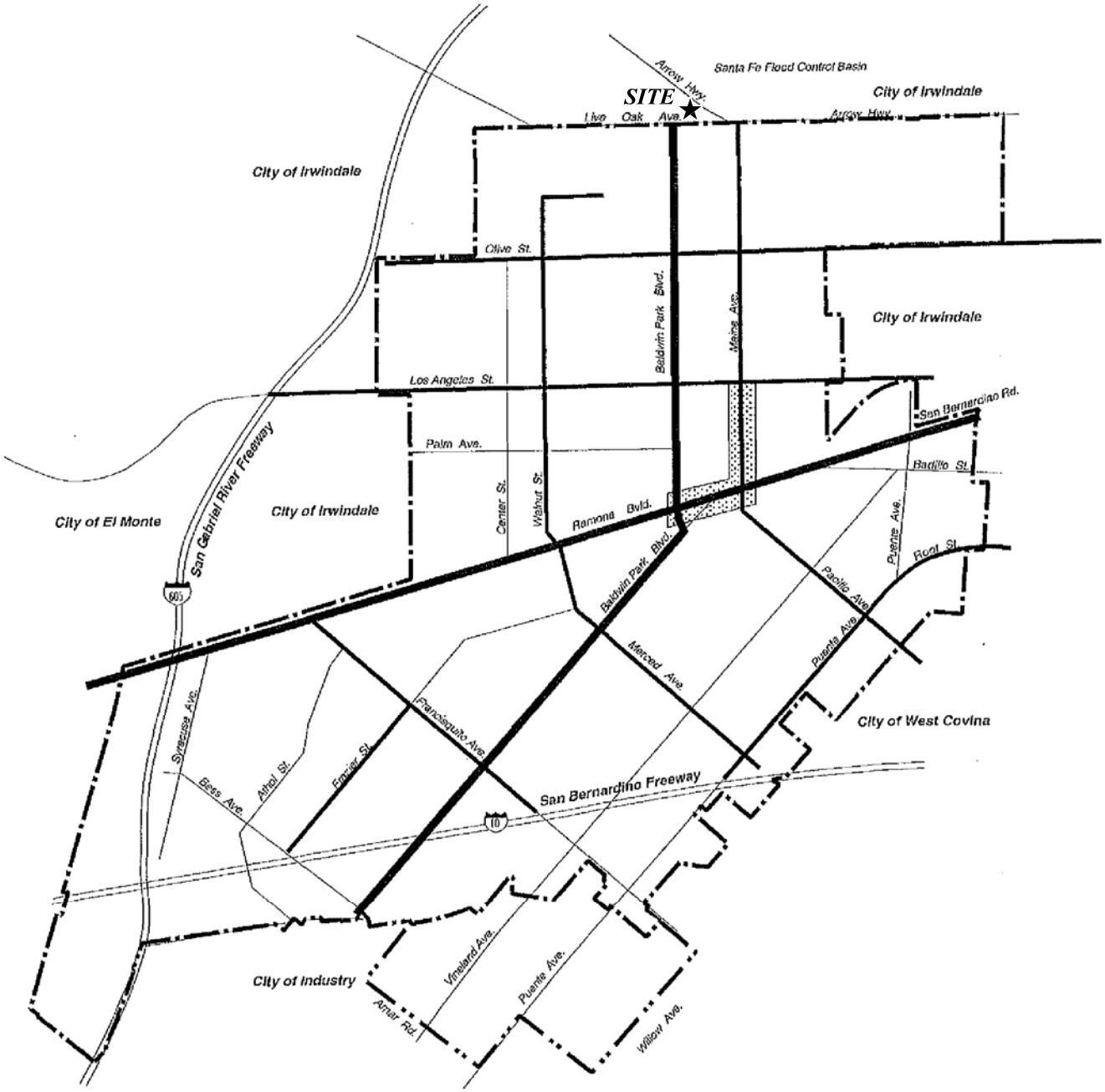


The City of Baldwin Park roadway classifications and typical roadway cross-sections are illustrated on Exhibit 3-K and 3-L, respectively. As shown on Exhibit 3-K, Baldwin Park Boulevard is classified as an Arterial in the study area. Per the City of Baldwin Park General Plan Roadway Cross-Section (Exhibit 3-L), an Arterial level roadway has 100' ROW with 40' for travel lanes in each direction.

Exhibit 3-M illustrates the City of Irwindale truck routes. As shown on Exhibit 3-M, Arrow Highway and Live Oak Avenue are designated truck routes, as is Irwindale Avenue. Local truck access is also allowed on Graham Access Road, Rivergrade Road, and the other local streets serving industrial uses in the study area.

EXHIBIT 3-K

CITY OF BALDWIN PARK
GENERAL PLAN CIRCULATION ELEMENT



LEGEND:

- City Boundary
- Sphere of Influence
- Arterial
- Collector/Industrial
- Special Study Area

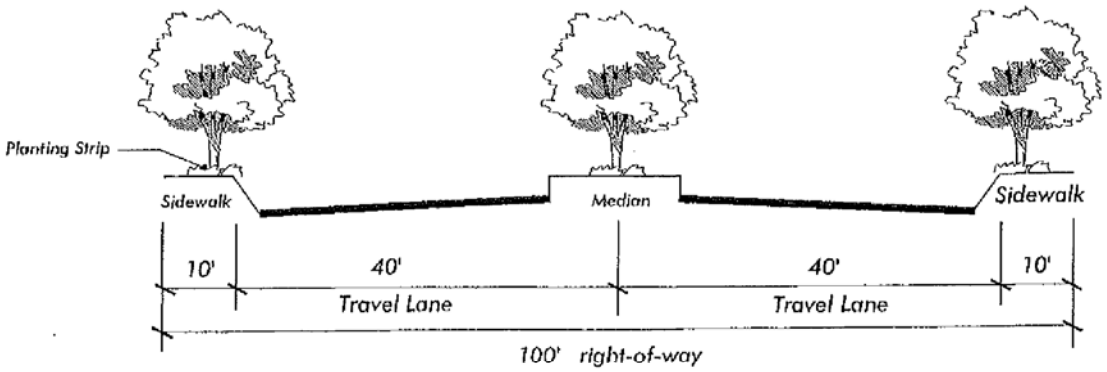
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SOURCE: BALDWIN PARK 2020 GENERAL PLAN

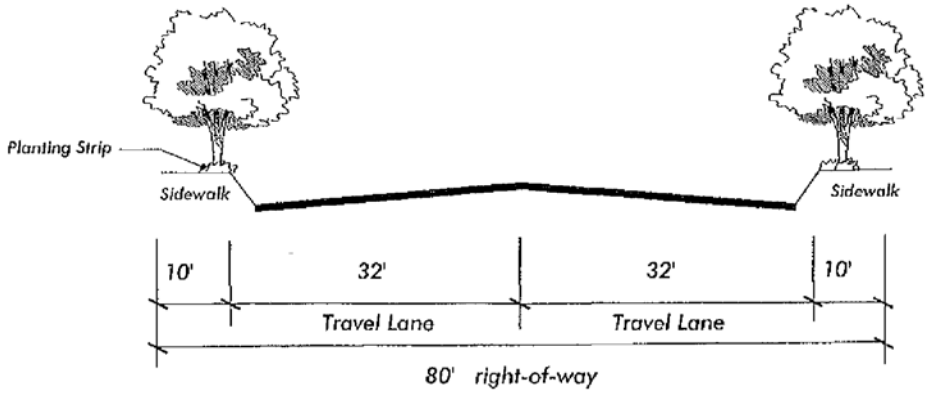
EXHIBIT 3-L

CITY OF BALDWIN PARK
GENERAL PLAN ROADWAY CROSS-SECTIONS

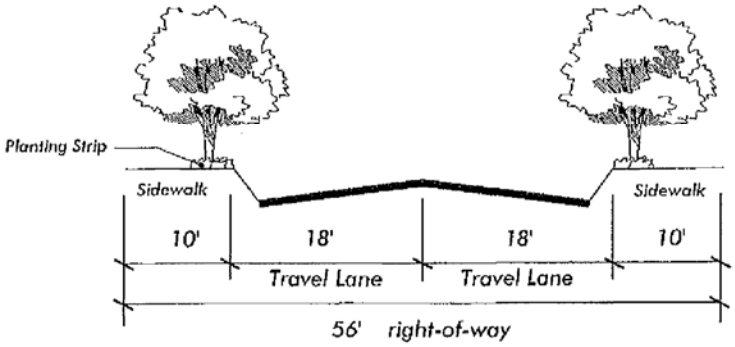
Arterial Street: 100' right-of-way



Collector / Industrial: 80'right-of-way



Residential: 60' right-of-way

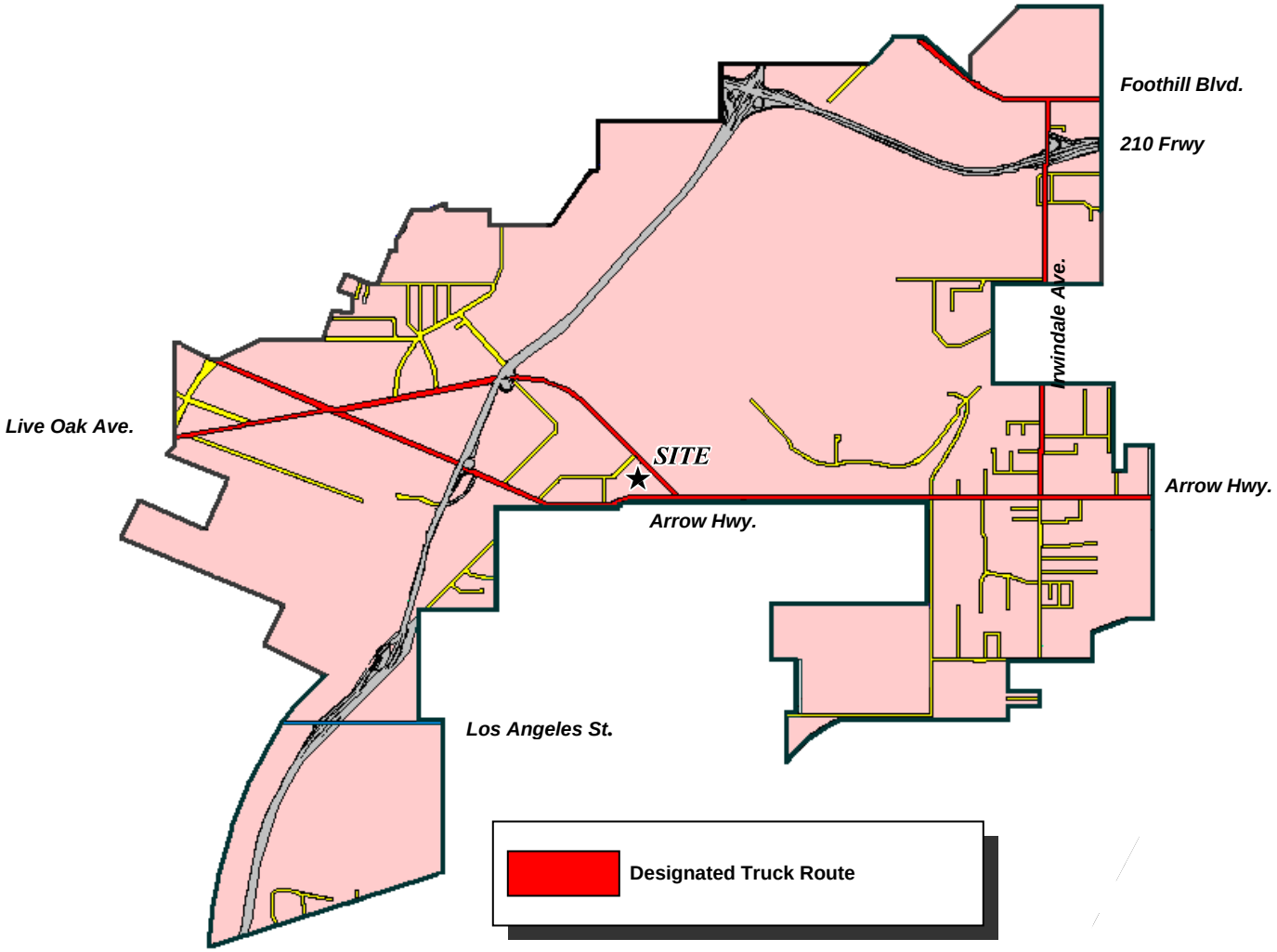


Note: Right-of-way widths represent maximums. City reserves the right to develop narrower streets consistent with land use goals for pedestrian districts and within residential subdivisions.

SOURCE: BALDWIN PARK 2020 GENERAL PLAN

EXHIBIT 3-M

CITY OF IRWINDALE TRUCK ROUTES



4.0 FUTURE TRAFFIC VOLUMES

This chapter of the report discusses the volume calculation methodology utilized to forecast the future traffic volumes for the following scenarios:

- Existing (2013) Conditions
- Existing Plus Project Conditions
- Interim Year (2016) Conditions Without and With Project Conditions
- Long Range (2035) Conditions Without and With the Project

4.1 Existing Plus Project

For Existing Plus Project conditions, project only traffic volumes were added to the existing (2013) traffic volumes (presented in Chapter 3 of this report). Exhibit 4-A, 4-B, and 4-C present the Existing Plus Project ADT, AM peak hour, and PM peak hour traffic volumes respectively. As shown on these exhibits, Live Oak Avenue, west of Arrow Highway (North) is projected to carry approximately 33,900 vpd. Arrow Highway adjacent to the project site is projected to carry between 23,700 and 17,200 VPD. The highest daily traffic volume in the study area is 34,900 VPD on Arrow Highway east of Maine Avenue.

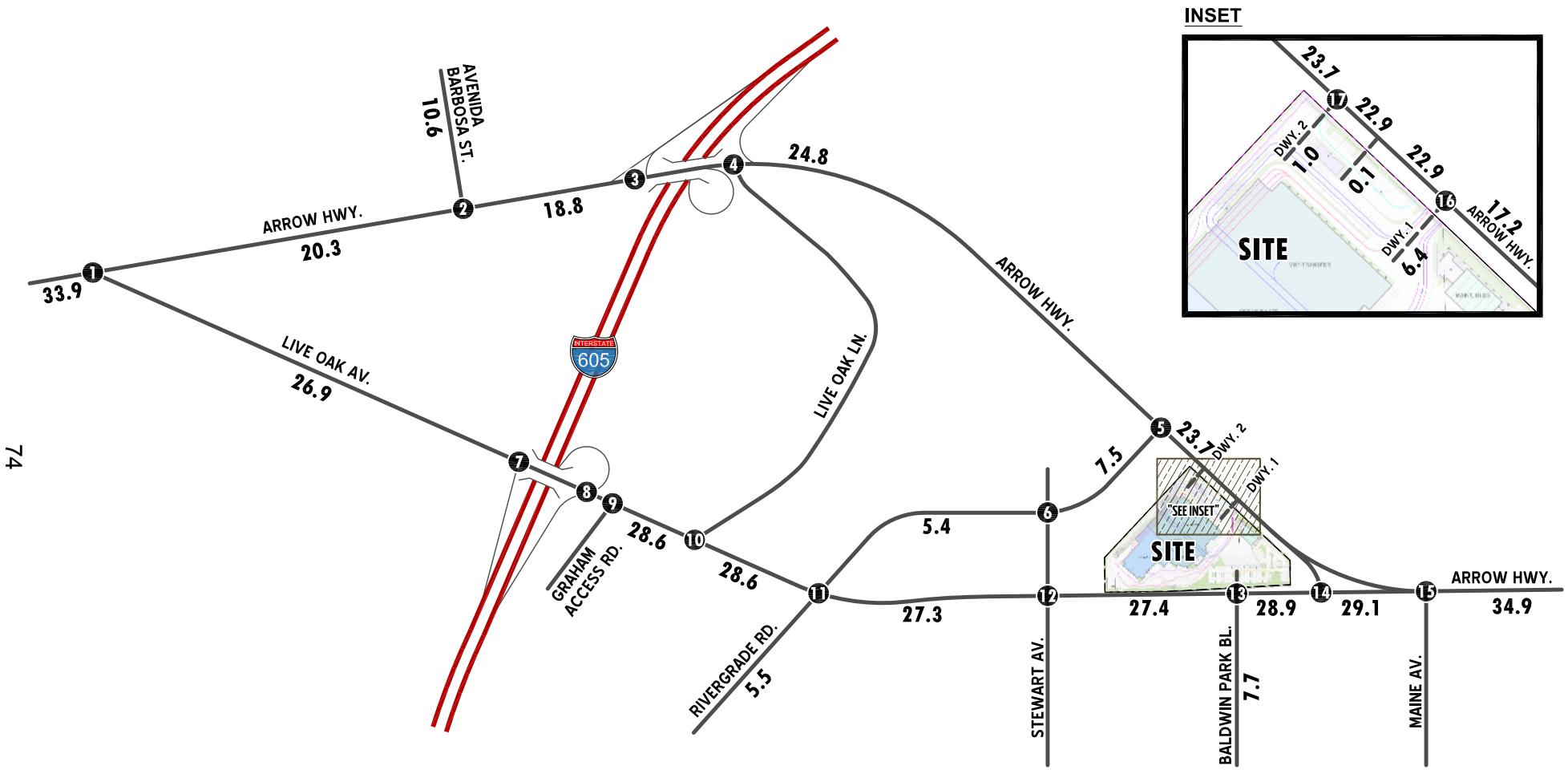
It should be noted that intersection of Arrow Highway and Project Driveway 1 is anticipated to warrant a traffic signal under Existing plus Project conditions. As mentioned previously, the traffic signal warrant analysis worksheet is included in Appendix "G" of the report.

4.2 Interim Year (2016) Without Project

For Interim Year (2016) Without Project conditions, an ambient growth rate of 2.0% per year (consistent with City of Irwindale traffic study guidelines) was applied to the existing (2013) for three years (a total background growth of 6%) in addition to the cumulative project / other development data. Other cumulative development has been obtained from

EXHIBIT 4-A

EXISTING (2013) PLUS PROJECT AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 4-B

EXISTING WITH PROJECT AM PEAK HOUR INTERSECTION VOLUMES

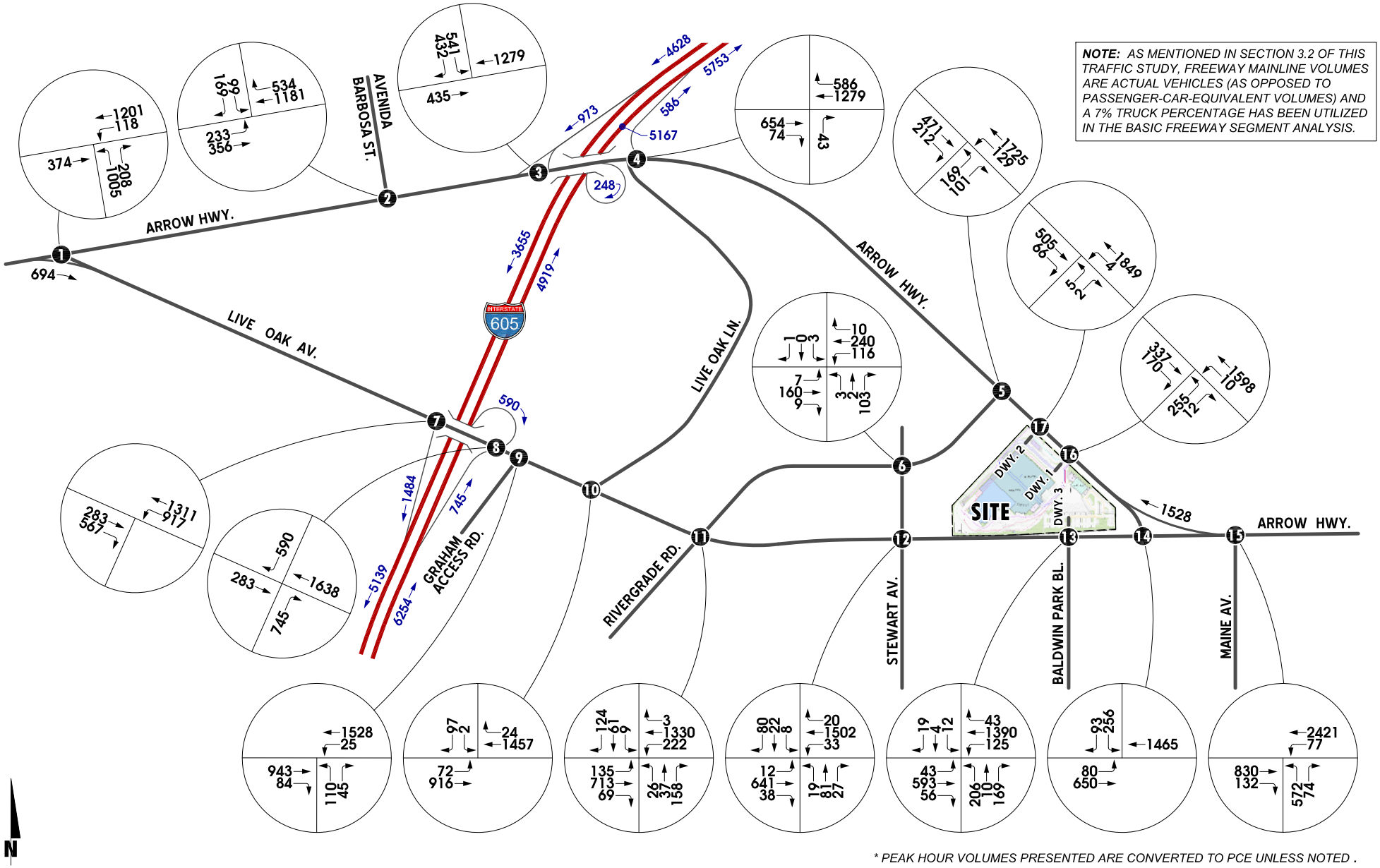
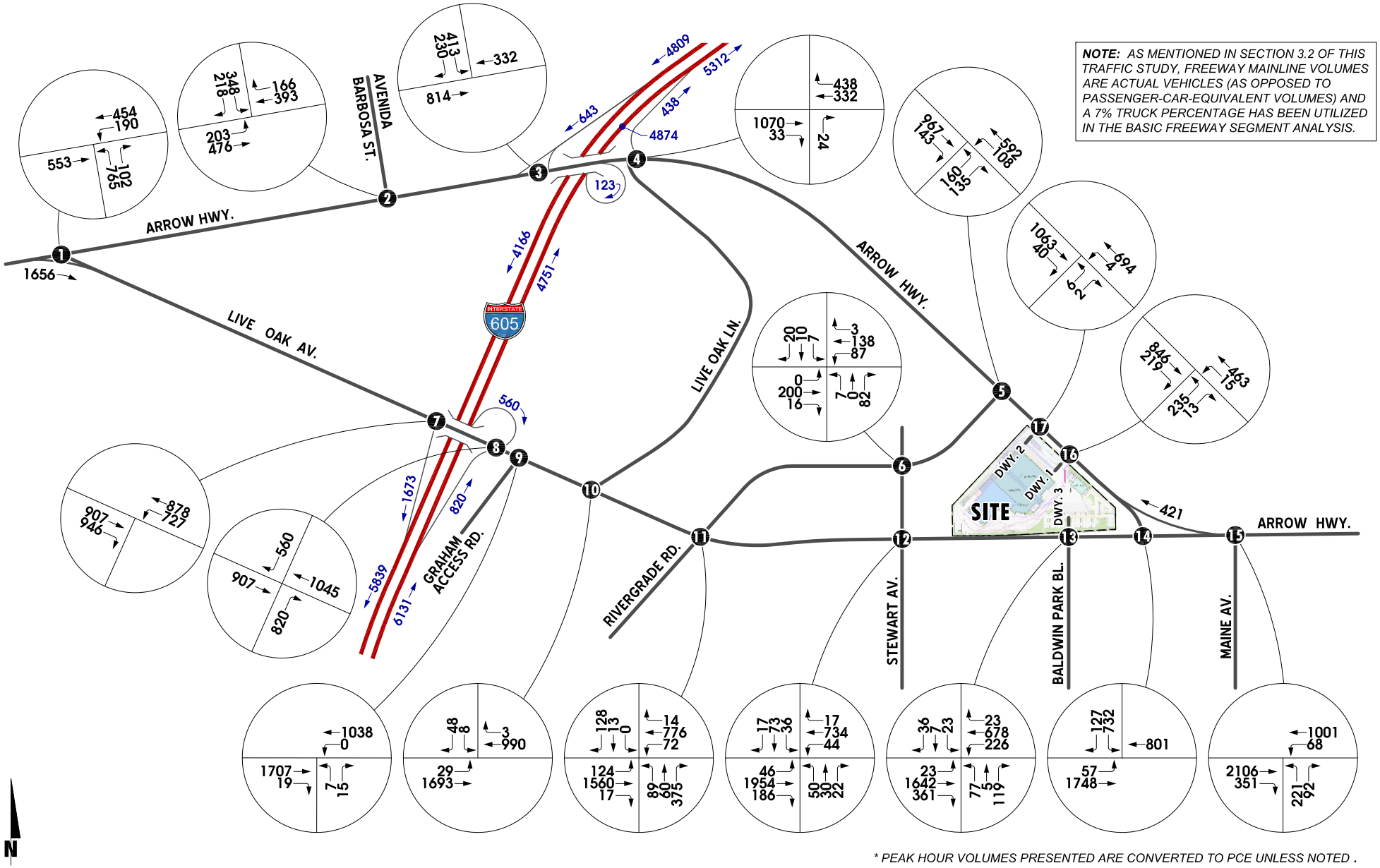


EXHIBIT 4-C

EXISTING WITH PROJECT PM PEAK HOUR INTERSECTION VOLUMES

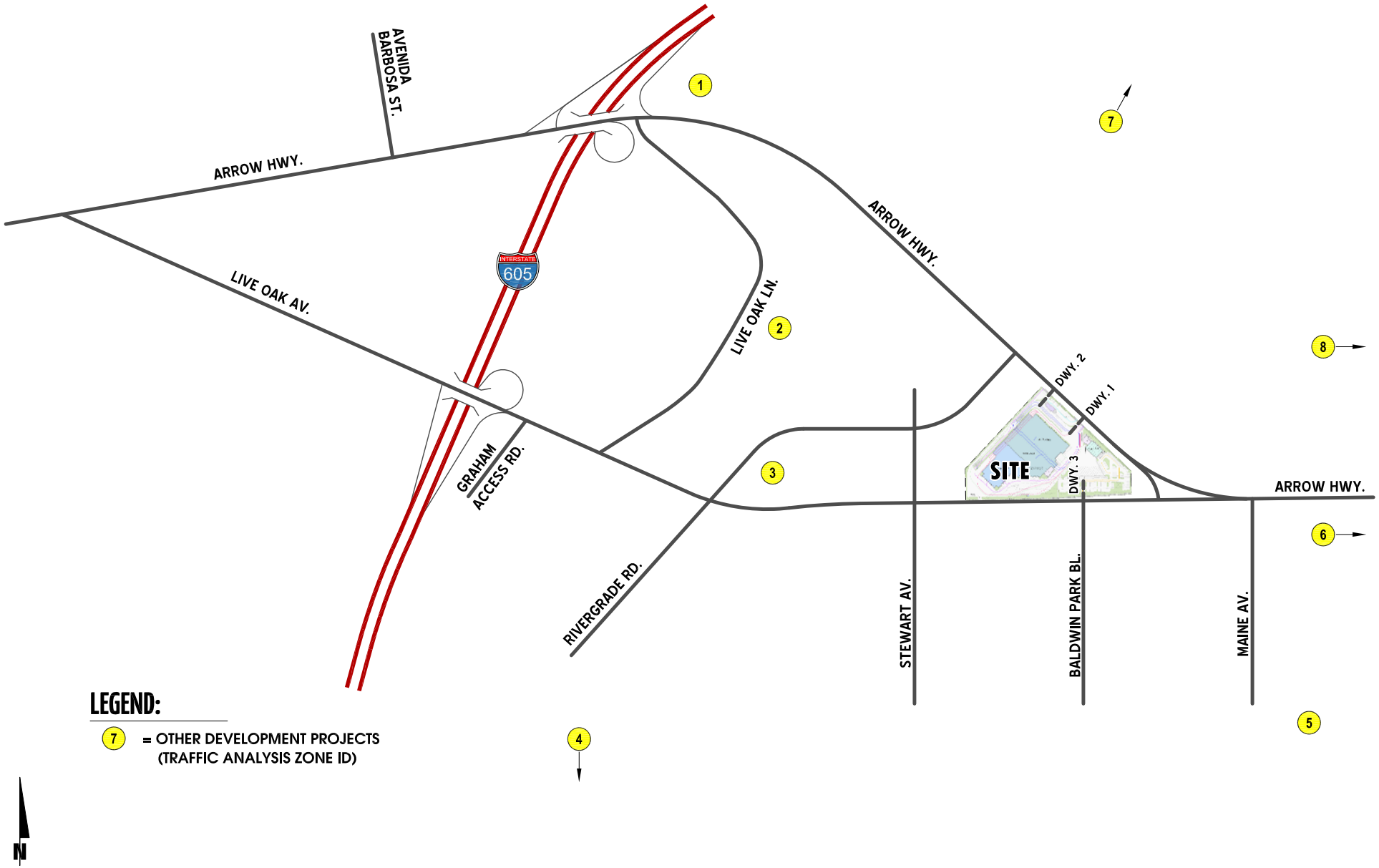


the City of Irwindale and other nearby cities and grouped into eight (8) traffic analysis zone (TAZ) locations. The TAZ locations of the anticipated cumulative development projects are shown on Exhibit 4-D. The following projects have been identified by the various jurisdictions:

CITY OF IRWINDALE PROJECTS	
• Kare Youth League/Santa Fe Dam Sports Park • Huy Fong Foods • City Infill Housing Project • City Senior Housing Project • 5200 Rivergrade Road (Commercial)	• Drive-through Car Wash -15875 Arrow Hwy. • Parking Structure - 6000 Irwindale Av. • Ahern Rentals - 13645 Live Oak Ln. • Hotel - 15744 Arrow Hwy. • Mod 4-06 to CUP 67-6 - 16025 Cypress St.
CITY OF AZUSA PROJECTS	
• Waste Management MRF & Transfer Station • Downtown Azusa Project 1 - 619/621 N. Azusa • Residential Project - 710 S. Azusa Av. • Gladstone Mixed Use - 890 Gladstone St. • Residential - 523-531 Arrow Hwy. • Monrovia Nursery - Specific Plan • Azusa Pacific University - Specific Plan	• Mixed Use Project - NEC of Dalton & Foothill • Block 36 - SEC of Azusa Av. & Foothill Bl. • Target Project - 809 N Azusa Av. • Azusa Rock Revised CUP & Reclamation Plan • Residential - 9th St. & Alameda Av. • Commercial - 880 S Azusa Av.
CITY OF COVINA PROJECTS	
• Taco Bell - 301 N Citrus Av. • Jack in the Box/CVS - 545 S. Citrus Av. • Lowes - 1348 N Azusa Av. • Condominiums - 615 N 3rd St. • Residential - 436 E Cypress St. • Condominiums Citrus Av. & Italia St.	• Mixed Use Condominiums - Citrus Av. & Italia St. • Rose Gardens at Santa Teresita • Andres Duarte Terrace Phase II • Huntington Counts Phase II and III • Attalla Ranch (Las Lomas Est.)
CITY OF BALDWIN PARK PROJECTS	
• Residential - 13655 Foster Av. • Residential - 3346 Vineland Av. • Residential - 13732 Monterey Av. • Residential - 13734 Monterey Av. • Residential - 13736 Monterey Av. • Residential - 12723 Bess Av. • Residential - 12725 Bess Av. • Residential - 12727 Bess Av. • Residential - 3138 Magum St. • Residential - 4859 Marion Av. • Residential - 4861 Marion Av. • Residential - 4503 Park Av.	• Residential - 4143 Hornbrook Av. • Residential - 4455 Park Av. • Residential - 4819 Lante St. • Residential - 4820-28 Fortin Av. • Commercial - 4341 Maine Av. • Restaurant - 14622 Dalewood St. • Warehouse - 5029 Bleecker St. • Office - 4814 Maine Av. • Office - 3323 Baldwin Park Bl. • Office - 13329 Garvey Av. • Fueling Facility (Truck Fleet) -13940 Live Oak Av. • Inst.Facility w/Parking Structure -14403 Pacific Av.
CITY OF WEST COVINA PROJECTS	
• Westfield Expansion - 112 Plaza Dr. • McIntyre Square Exp. -2612-1698 E.Garvey • West Covina Senior Villas - 1838 E Workman Av.	• Mixed-Use - 1045-1052 West Grondahl St. • Medical Imaging Center - 1700 West Covina Pkwy. • Office - SEC of West Covina Pwy. & W Garvey S.

EXHIBIT 4-D

OTHER DEVELOPMENTS LOCATION MAP



CITY OF GLENDORA PROJECTS	
● Diamond Ridge ● Cataract ● JPI Sevilla Project ● Glendora Station ● Tract 46680 ● Tract 46916 ● Tract 45858	● Glendora Marketplace ● Wildwood Canyon ● Monrovia Nursery ● Grand-Foothill ● Grand Av. Retail Center ● WalMart Expansion ● Route 66 Specific Plan

Table 4-1 summarizes the anticipated cumulative development projects' trip generation per TAZ.

Trip distribution assumptions have been obtained from the cumulative project traffic study reports where available, or developed independently for those projects where published information was not available. The trip distributions for each of the cumulative development projects are included as Appendix "H" of this report.

Based on the identified trip generation and distributions for other developments on arterial highways throughout the study area, other cumulative development project daily traffic volumes and AM and PM peak hour intersection turning movement volumes have been developed and are shown on Exhibit 4-E, Exhibit 4-F, and Exhibit 4-G, respectively.

Exhibit 4-H, Exhibit 4-I, and Exhibit 4-J present the Interim Year (2016) Without Project ADT, AM peak hour, and PM peak hour traffic volumes, respectively. As shown on these exhibits, Live Oak Avenue, west of Arrow Highway (North) is projected to carry approximately 37,400 vpd.

4.3 Interim Year (2016) With Project

For Interim Year (2016) With Project conditions, project only traffic volumes were added to the Interim Year Without Project volumes described above. Exhibit 4-K, Exhibit 4-L, and Exhibit 4-M present the Interim Year (2016) With Project ADT, AM peak hour, and PM peak hour traffic volumes, respectively. As shown on these exhibits, Live Oak Avenue, west of Arrow Highway (North) is projected to carry approximately 37,700 vpd. Arrow Highway adjacent to the project site is projected to carry between 26,200 and 19,700 VPD.

TABLE 4-1
OTHER DEVELOPMENT TRIP GENERATION SUMMARY[1]

ID	Project Name/Location	Land Use	Quantity [c]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily	Jurisdiction
1	Kare Youth League/ Santa Fe Dam Sports Park NEC of Arrow Highway & I-605	Youth sports park	17.0 AC	15	13	28	40	40	80	710	City of Irwindale
	TAZ 1 Subtotal			15	13	28	40	40	80	710	
2	Ahern Rentals 13645 Live Oak Lane	Replace 23,000 SF bldg. with 29,000 SF building	6 TSF	5	1	6	1	5	6	42	City of Irwindale
	TAZ 2 Subtotal			5	1	6	1	5	6	42	
3	5200 Rivergrade Road Restaurant, Convinience Store, and Gas Station	Service Station w/ Conv. Store	18 VFP	109	105	214	128	123	251	2,751	City of Irwindale
		Fast Food Rest. w/ Drive-Thru	2.8 TSF	70	68	138	49	45	94	1,389	
		15% Pass-by Credit		*(27)*	*(26)*	*(53)*	*(27)*	*(25)*	*(52)*	*(621)*	
		Subtotal		152	147	299	150	143	293	3,519	
	Fueling Facility for Truck Fleet [b] 13940 Live Oak Av.	Fueling Station	-	-	-	-	-	-	-	-	City of Baldwin Park
	TAZ 3 Subtotal			152	147	299	150	143	293	3,519	--
4	Commercial (Jack in the Box & CVS Pharmacy) 545 S Citrus Avenue	Fast-Food Rest. w/ Drive- Thru	1.188 TSF	30	29	59	21	19	40	589	City of Covina
		Pharmacy / Drug Store	10.658 TSF	20	14	34	45	45	90	960	
		Subtotal		50	43	93	66	64	130	1,549	
	Residential - 13655 Foster Av.	Medium-Density Residential	10 DU	1	4	5	4	2	6	67	City of Baldwin Park
	Residential 3346 Vineland Av.	Medium-Density Residential	15 DU	2	6	8	6	3	9	100	
	Residential - 13732 Monterey Av., Residential - 13734 Monterey Av., Residential - 13736 Monterey Av., Residential - 12723 Bess Av., Residential - 12725 Bess Av., Residential - 12727 Bess Av., Residential - 3138 Magum St., Residential - 4503 Park Av., Residential - 4143 Hornbrook Av., Residential - 4455 Park Av.	Single Family Residential	10 DU	0	10	10	10	0	10	100	
	Commercial - 4341 Maine Av.	Commercial	4.5 TSF	3	2	5	10	7	17	193	
	Restaurant - 14622 Dalewood St.	Rest.	15.295 TSF	92	85	177	101	70	171	1,945	
	Office - 3323 Baldwin Park Bl.	Office	4.95 TSF	7	1	8	1	6	7	54	
	13329 Garvey Av.	Office / Warehouse	13.62 TSF	19	3	22	3	17	20	150	
	Institutional Facility with Parking Structure -14403 Pacific Av.	Institution	176.2 TSF	870	166	1,036	66	147	213	12,145	
	Westfield Expansion 112 Plaza Dr.	Shopping Center	32 TSF	20	12	32	73	47	120	1,418	City of West Covina
	McIntyre Square Expansion 2612-1698 E Garvey Av.	Rest.	4.8 TSF	29	27	56	32	22	54	610	
		Retail	4.8 TSF	3	2	5	11	7	18	206	
		Subtotal		32	29	61	43	29	72	816	
	West Covina Senior Villas 1838 E Workman Av.	High-Density Residential	65 DU	7	27	34	22	12	34	432	
	Medical / Professional Office SEC of W. Covina Pwy. & W Garvey S.	Office	55 TSF	75	10	85	14	68	82	606	City of West Covina
	TAZ 4 Subtotal			1,178	398	1,576	419	472	891	19,575	--

TABLE 4-1
OTHER DEVELOPMENT TRIP GENERATION SUMMARY[1]

ID	Project Name/Location	Land Use	Quantity [c]	AM Peak Hour			PM Peak Hour			Daily	Jurisdiction
				In	Out	Total	In	Out	Total		
5	Huy Fong Foods 4800 Azuza Canyon Rd.	Warehouse	454 TSF	-	-	-	-	-	-	-	City of Irwindale
		Food Manufacturing	150 TSF	-	-	-	-	-	-	-	
		Administrative Office	22.184 TSF	-	-	-	-	-	-	-	
		Subtotal		154	90	244	105	127	232	775	
	Mod 4-06 to CUP 67-6 16025 Cypress Street	Our Lady of Guadalupe Church	12.227 TSF	4	3	7	3	4	7	111	
	Residential - 4859 Marion Av., Residential - 4861 Marion Av., Residential - 4819 Lante St., Residential - 4820-28 Fortin Av.	Single Family Residential	4 DU	0	4	4	4	0	4	40	City of Baldwin Park
	Office - 4814 Maine Av.	Office	6.3 TSF	9	1	10	0	2	2	69	
	TAZ 5 Subtotal			167	98	265	112	133	245	995	--
6	City Senior Housing Project 16140 Arrow Hwy.	Senior Housing	9 DU	2	4	6	1	0	1	33	City of Irwindale
	Drive-through Car Wash 15875 Arrow Hwy.	(Car wash structure added to existing gas station w/ convienience store)	12 VFP	73	70	143	85	82	167	1,834	
	Hotel - 15744 Arrow Hwy.	Hotel	120 RM	41	26	67	37	34	71	980	
	Warehouse - 5029 Bleecker St.	Warehouse	8.748 TSF	2	1	3	1	2	3	31	Baldwin Park
	TAZ 6 Subtotal			118	101	219	124	118	242	2,878	--
7	City Infill Housing Project	Single Family Units	7 DU	0	0	0	0	0	0	0	City of Irwindale
	Parking Structure 6000 Irwindale Avenue	Four level 480 space (249 net new spaces) parking garage to serve the Gateway Business Center.	249 Parking Spaces	0	0	0	0	0	0	0	
	Downtown Azusa Project 1 619/621 North Azusa Av.	Rest.	3.9 TSF	23	22	45	26	18	44	496	City of Azusa
		Office	1.035 TSF	1	0	1	0	1	2	11	
		Subtotal		24	22	46	26	19	46	507	
	Monrovia Nursery Specific Plan	Single Family Units	752 DU	141	423	564	478	281	759	7,197	
		Residential Condominiums	823 DU	62	301	363	287	141	428	4,782	
		Elementary School	245 STU	61	50	111	18	19	37	316	
		Middle School	175 STU	52	43	95	14	14	28	284	
		Park	6 AC	0	0	0	0	0	0	9	
		Transit Commercial	50 TSF	31	20	51	114	73	187	2,147	
		Subtotal		347	837	1,184	911	528	1,439	14,735	
	Azusa Pacific University Specific Plan	East Campus	874 STU	147	37	184	55	128	183	2,080	
		West Campus	2,550 STU	428	107	535	161	375	536	6,069	
		Subtotal		575	144	719	216	503	719	8,149	
	Mixed Use Project NEC of Dalton Avenue & Foothill Bl.	Residential	73 DU	7	30	37	29	16	45	485	
		Retail	8 TSF	5	3	8	18	12	30	344	
		Subtotal		12	33	45	47	28	75	829	
	Block 36 SEC of Azusa Av. & Foothill Bl.	Residential Apartments	110 DU	11	45	56	44	24	68	732	
		Office	29.2 TSF	40	5	45	7	36	43	321	
		Retail/Commercial	30 TSF	18	12	30	68	44	112	1,288	
		Rest.	7.5 TSF	45	41	86	49	34	83	954	
		Subtotal		114	103	217	168	138	306	3,295	
	Target Project - 809 N Azusa Av.	Retail	150 TSF	92	59	151	341	218	559	6,441	

TABLE 4-1
OTHER DEVELOPMENT TRIP GENERATION SUMMARY[1]

ID	Project Name/Location	Land Use	Quantity [c]	AM Peak Hour			PM Peak Hour			Daily	Jurisdiction
				In	Out	Total	In	Out	Total		
	Azusa Rock Revised CUP & Reclamation Plan [a] Northerly terminus of Encanto Pkwy. & Fish Cyn. Rd.	Mineral Resource - Mining	Revised CUP & Reclamation Plan; Modify operations & reclamation approach	56	56	112	19	19	38	0	City of Azusa
	Residential - 9th St. & Alameda Av.	Residential Townhomes	14 DU	1	5	6	5	2	7	81	
	Rose Gardens at Santa Teresita 800 Buena Vista Street	Nursing Facility, Assisted Living	229.292 TSF	21	11	32	22	28	50	610	
	Andres Duarte Terrace Phase II 1700 Huntington Drive	High-Density Residential	43 DU	4	18	22	17	9	26	286	
	Huntington Counts Phase III 2400 Huntington Drive	Medium-Density Residential	16 DU	2	7	9	6	3	9	106	City of Duarte
	Huntington Courts Phase II 2400 Huntington Drive	Residential (Single/Multi-Family)	14 DU	1	6	7	6	3	9	93	
	Attalla Ranch (Las Lomas Est.) NEC of Sunnydale & Woodbluff	Single Family Residential	15 DU	3	8	11	10	6	16	144	
	Diamond Ridge	Quality Rest.	6.5 TSF	0	0	0	33	16	49	585	
		Office	30 TSF	41	6	47	8	37	45	330	
		Subtotal		41	6	47	41	53	94	915	
	Cataract	Condominiums	17 DU	1	6	7	6	3	9	99	
	JPI Sevilla Project	Condomiums	161 DU	12	59	71	56	28	84	935	
		Office	12 TSF	16	2	18	3	15	18	132	
		Subtotal		28	61	89	59	43	102	1,067	
7	Glendora Station	Residential	87 DU	9	35	44	35	19	54	579	
		Office	5 TSF	7	1	8	1	6	7	55	
		Subtotal		16	36	52	36	25	61	634	
	Tract 46680	Single Family Residential	14 DU	3	8	11	9	5	14	134	City of Glendora
	Tract 46916	Single Family Residential	16 DU	3	9	12	10	6	16	153	
	Tract 45858	Single Family Residential	13 DU	2	7	9	8	5	13	124	
	Glendora Marketplace	Retail	50 TSF	31	20	51	114	73	187	2,147	
		Quality Rest.	4.2 TSF	N/A	N/A	0	21	10	31	378	
		Subtotal		31	20	51	135	83	218	2,525	
	Wildwood Canyon	Single Family Residential	54 DU	10	30	40	34	20	54	517	
	Monrovia Nursery	Single Family Residential	54 DU	10	30	40	34	20	54	517	
	Grand-Foothill	Townhouses	18 DU	6	30	36	29	14	43	105	
		Condominiums	64 DU	2	12	14	12	6	18	372	
		Subtotal		8	42	50	41	20	61	477	
	Grand Avenue Retail Center	General Commercial	14 TSF	9	5	14	32	20	52	601	
		Quality Rest.	4.2 TSF	N/A	N/A	N/A	21	10	31	378	
		Subtotal		9	5	14	53	30	83	979	
	WalMart Expansion	Retail/Grocery	20 TSF	14	7	21	50	50	100	1,145	City of Glendora
	Route 66 Specific Plan	Office	750 TSF	1,023	140	1,163	190	928	1,118	8,258	
		Commercial	750 TSF	458	293	751	1,706	1,091	2,797	32,205	
		Apartments	225 DU	23	92	115	91	49	140	1,496	
		Subtotal		1,504	525	2,029	1,987	2,068	4,055	41,959	
	TAZ 7 Subtotal			2,932	2,101	5,033	4,297	3,935	8,233	86,521	--

TABLE 4-1
OTHER DEVELOPMENT TRIP GENERATION SUMMARY[1]

ID	Project Name/Location	Land Use	Quantity [c]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily	Jurisdiction
8	Waste Management Materials Recycling Facility & Transfer Station 501 West Gladstone	125,000 sf processing building with offices to receive, process and transfer up to 3,800 tons per day of solid waste.	3800 Tons/ Day	224	148	372	400	320	720	4,294	City of Azusa
	Residential - 710 S. Azusa Av.	Residential Condominiums	81 DU	6	30	36	28	14	42	471	
	Gladstone Mixed Use 890 Gladstone Street	Residential Apartments	9 DU	1	4	5	4	2	6	60	
		Retail/Commercial	4.443 TSF	3	2	5	10	6	16	191	
		Subtotal		4	6	10	14	8	22	251	
	Residential - 523-531 Arrow Hwy.	Residential Condominiums	28 DU	2	10	12	10	5	15	163	
	Commercial - 880 S Azusa Av.	Commercial	47 TSF	29	18	47	107	68	175	2,018	
	Lowes - 1348 N Azusa Av.	Home Improvement Store	111.348 TSF	80	60	140	127	137	264	3,318	City of Covina
	Taco Bell - 301 N Citrus Av.	Fast-Food Rest. w/ Drive-Thru	3.445 TSF	87	83	170	60	55	115	1,709	
	Condominiums - 615 N 3rd St.	Condominiums	30 DU	2	11	13	10	5	15	174	
	Residential - 436 E Cypress St.	Single Family Residential	1 DU	0	1	1	1	0	1	10	
	Condominiums - Citrus Av. & Italia St.	Condominiums	37 DU	3	14	17	13	6	19	215	
	Mixed Use Condominiums Citrus Avenue & Italia Street	Retail	4.366 TSF	3	2	5	10	6	16	187	
		Residential Condominiums	4 DU	0	1	1	1	1	2	23	
		Subtotal		3	3	6	11	7	18	210	
	Mixed-Use Project 1045-1052 West Grondahl St.	Residential	412 DU	42	168	210	166	89	255	2,740	City of West Covina
		Commercial	20 TSF	12	8	20	46	29	75	859	
		Subtotal		54	176	230	212	118	330	3,599	
	Medical Imaging Center 1700 West Covina Pkwy.	Medical Office	9.3 TSF	13	2	15	2	12	14	102	
	TAZ 8 Subtotal			507	562	1,069	995	755	1,750	16,534	--

[1] Source: Transportation Study for the Athens Materials Recovery Facility and Transfer Station (01/2012). Prepared by Gibson Transportation Consulting Inc.

Trip Generation, 8th Edition, Institute of Transportation Engineers (ITE), 2008.Notes:

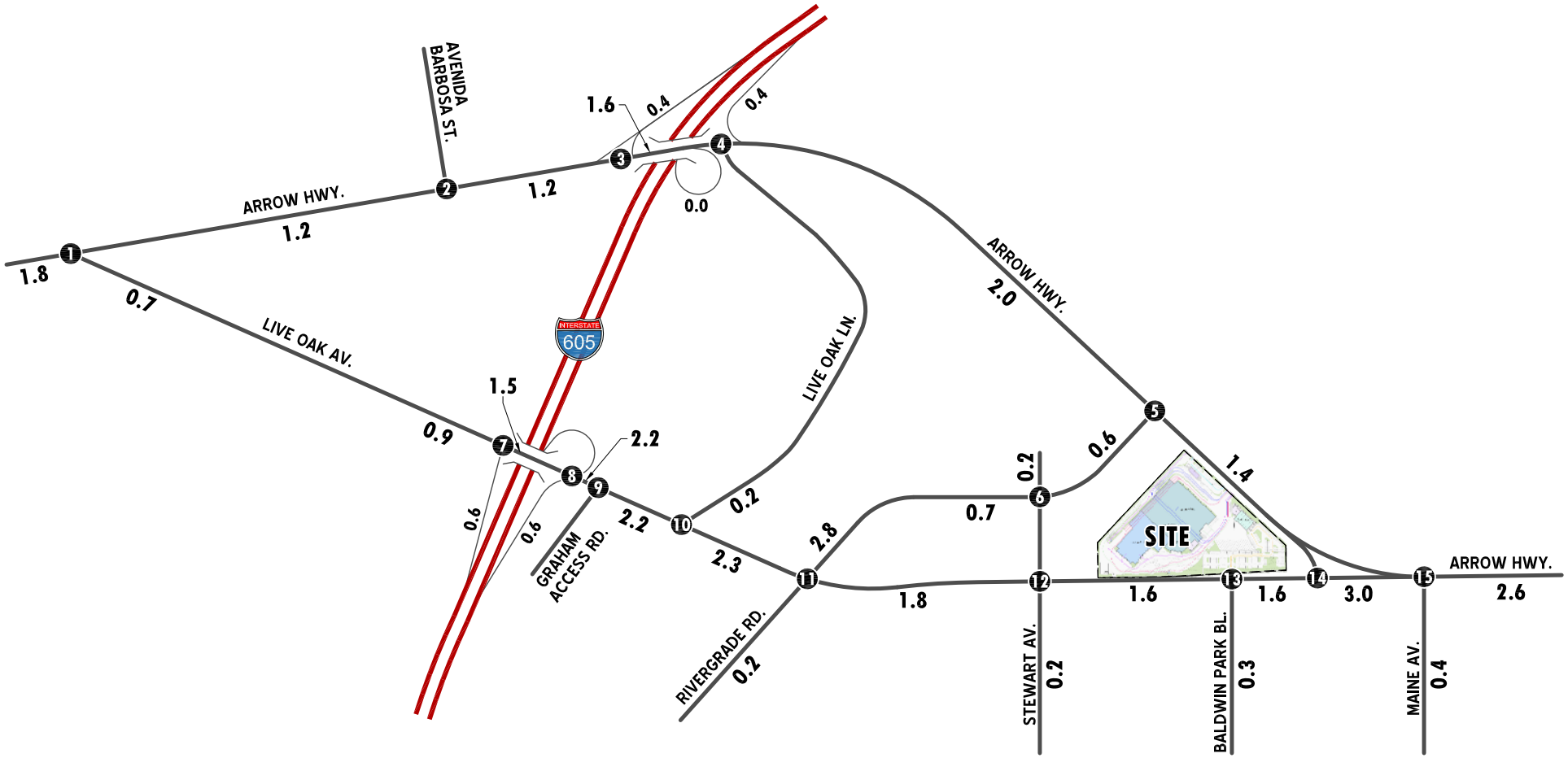
[a] Materials processed through conveyor belts, trucks pick up material at Foothill & Irwindale; study intersections not impacted

[b] Assumed conversion of existing truck fleet fueling station; no net additional trips

[c] DU:Dwelling Unit; SF: Square Feet

EXHIBIT 4-E

CUMULATIVE AVERAGE DAILY TRAFFIC (ADT)



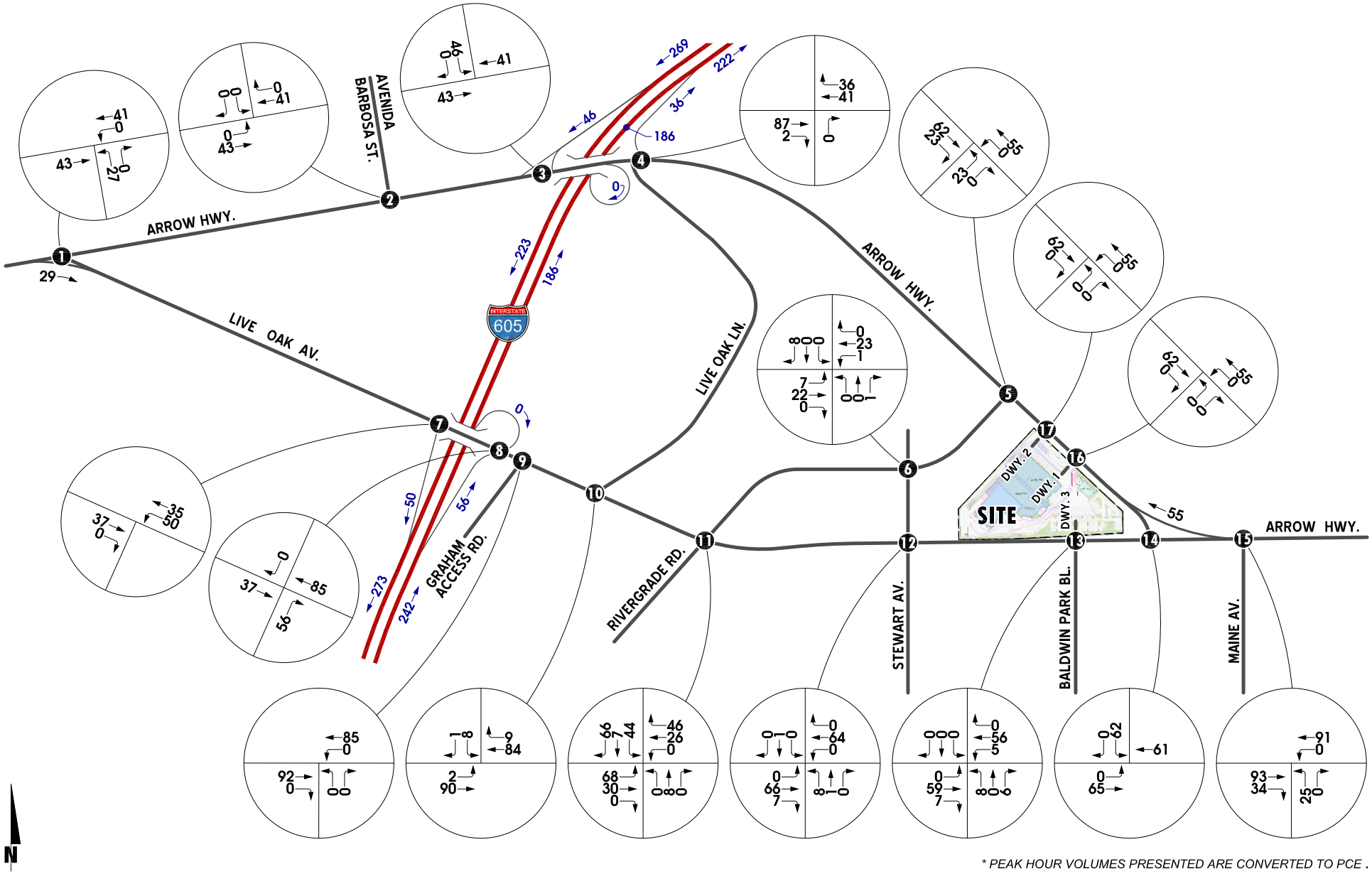
LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 4-F

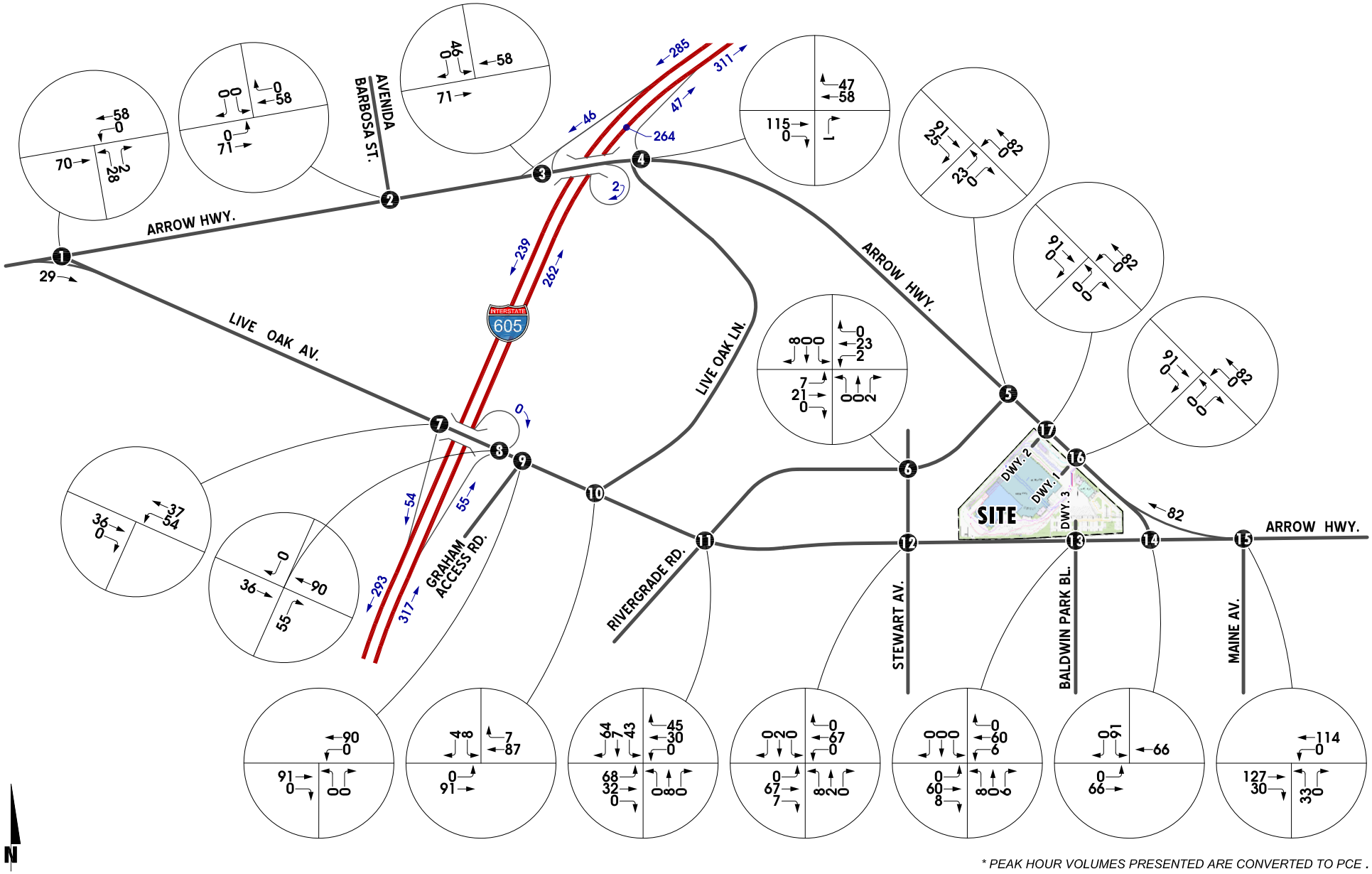
CUMULATIVE AM PEAK HOUR INTERSECTION VOLUMES



* PEAK HOUR VOLUMES PRESENTED ARE CONVERTED TO PCE .

EXHIBIT 4-G

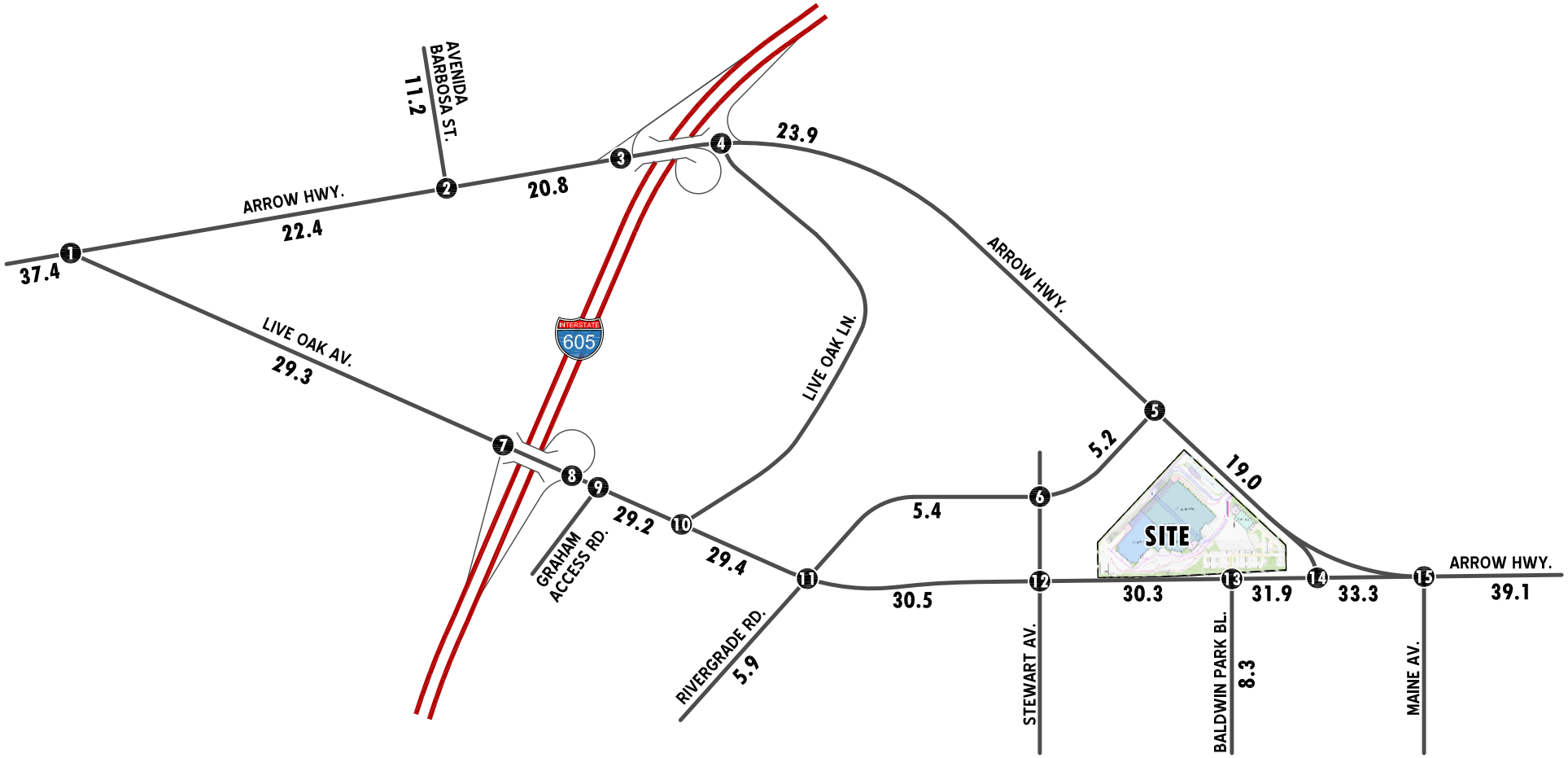
CUMULATIVE PM PEAK HOUR INTERSECTION VOLUMES



* PEAK HOUR VOLUMES PRESENTED ARE CONVERTED TO PCE .

EXHIBIT 4-H

INTERIM YEAR (2016) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 4-I

INTERIM YEAR (2016) WITHOUT PROJECT AM PEAK HOUR INTERSECTION VOLUMES

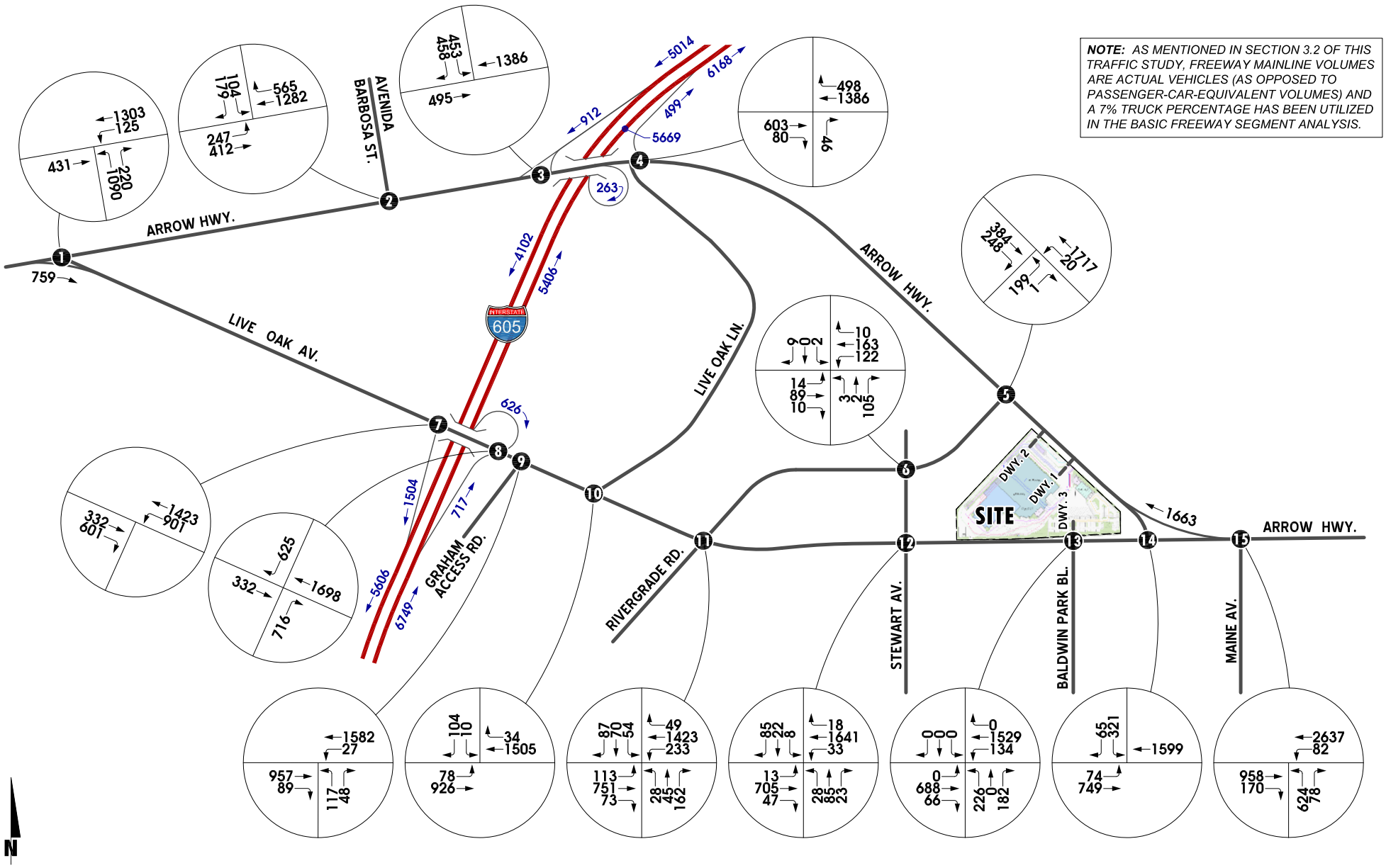


EXHIBIT 4-J

INTERIM YEAR (2016) WITHOUT PROJECT PM PEAK HOUR INTERSECTION VOLUMES

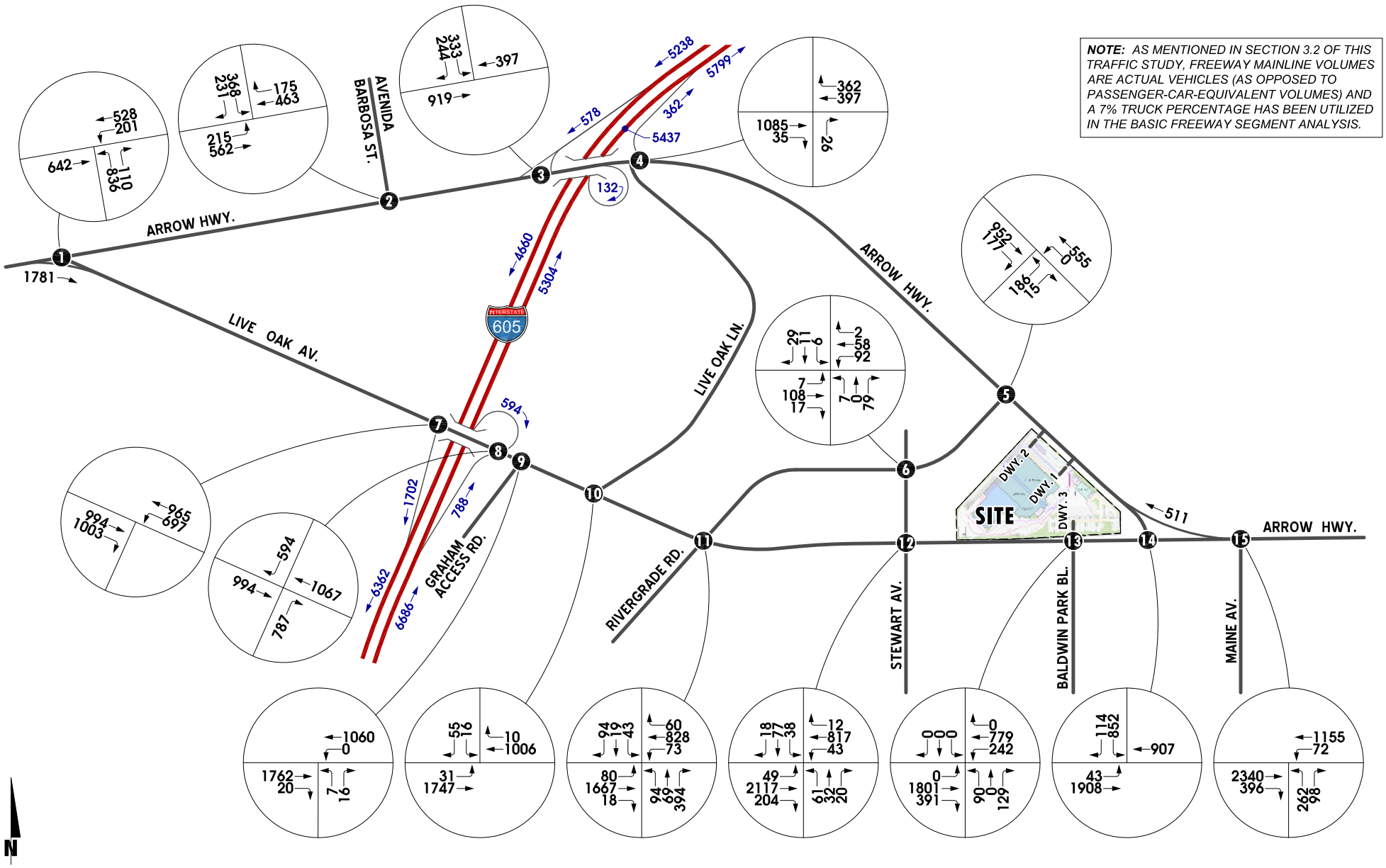
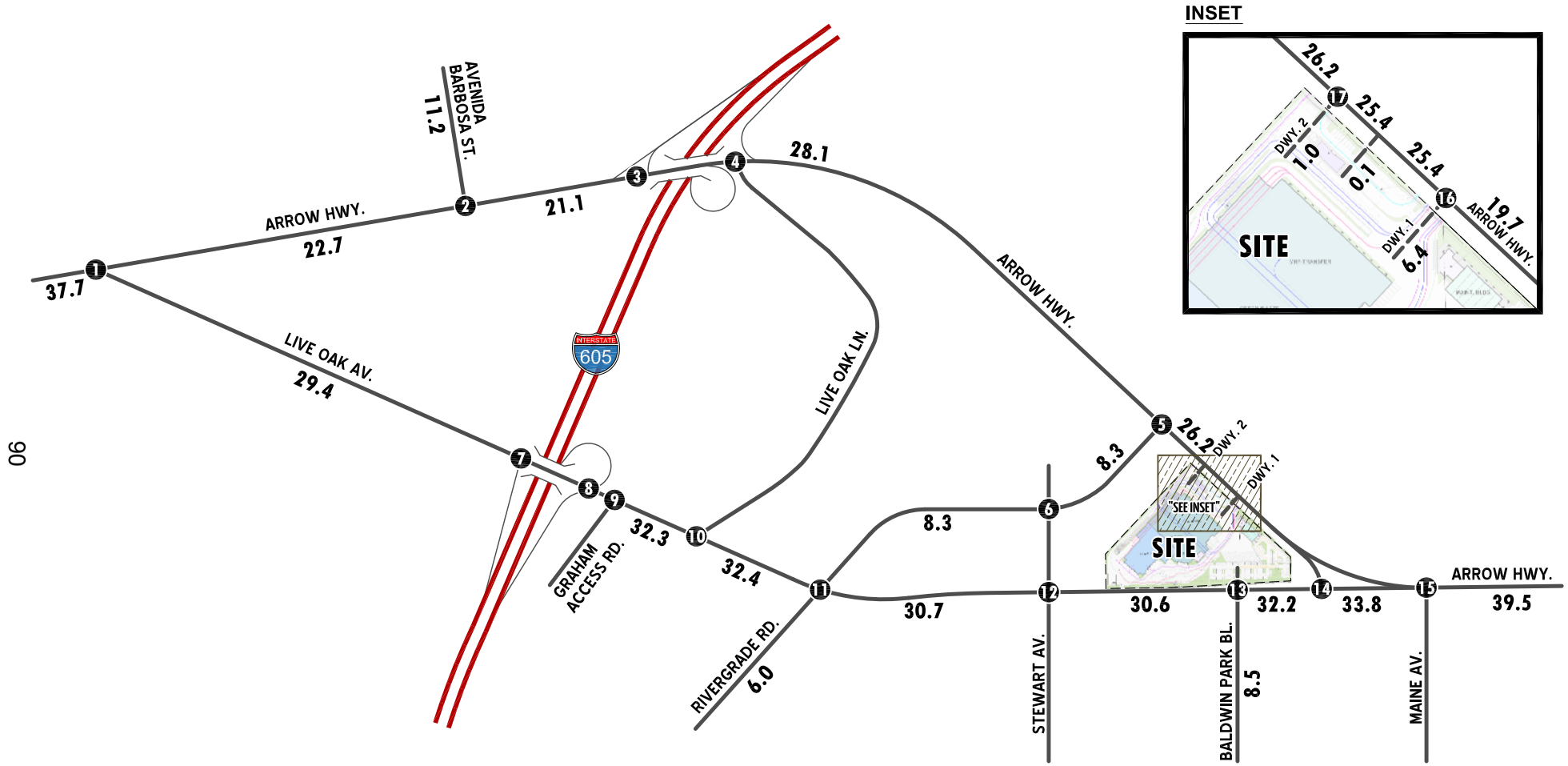


EXHIBIT 4-K

INTERIM YEAR (2016) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 4-L

INTERIM YEAR (2016) WITH PROJECT AM PEAK HOUR INTERSECTION VOLUMES

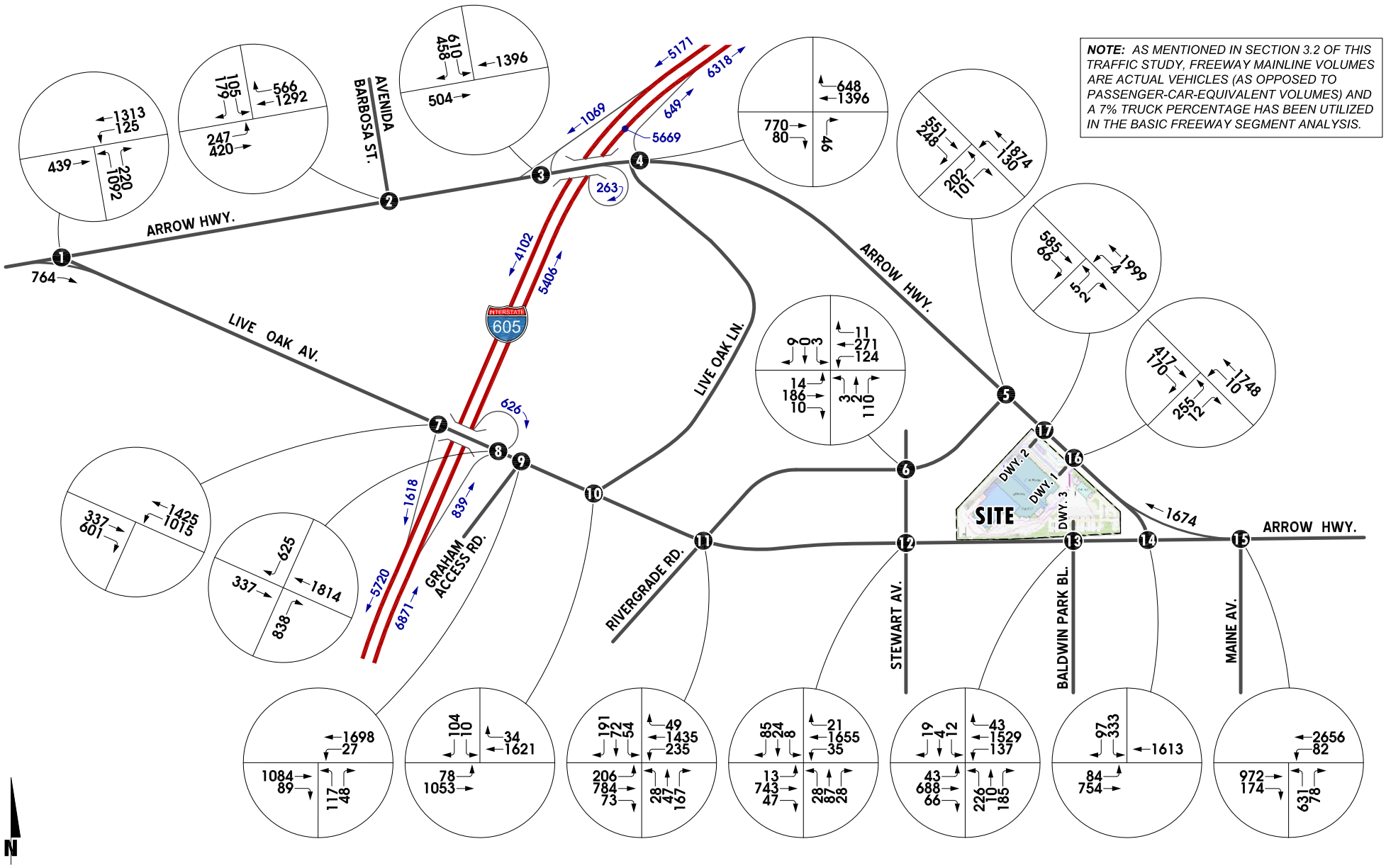
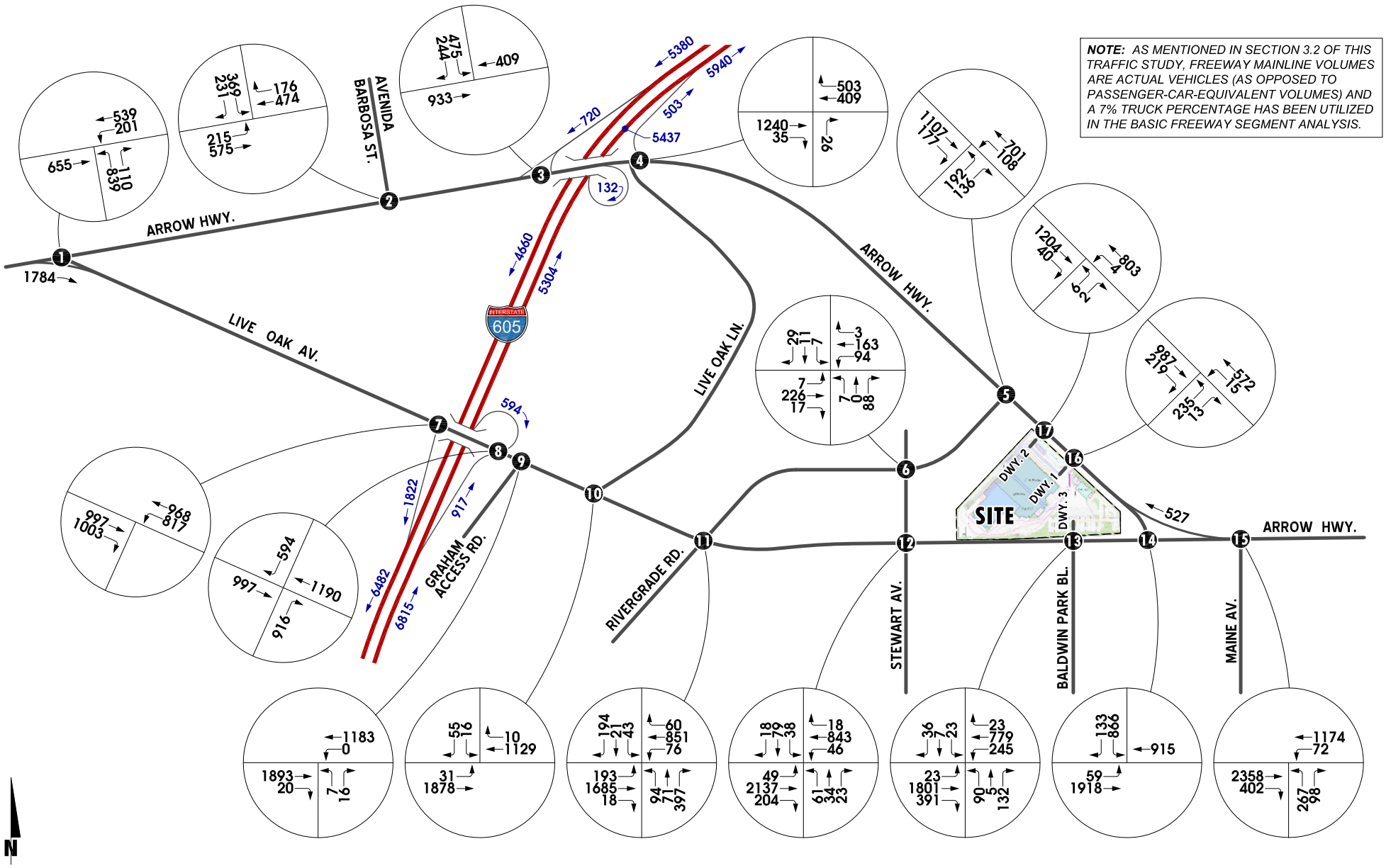


EXHIBIT 4-M

INTERIM YEAR (2016) WITH PROJECT PM PEAK HOUR INTERSECTION VOLUMES



The highest daily traffic volume in the study area is 39,500 VPD on Arrow Highway east of Maine Avenue.

4.4 Long Range (2035) Without Project

Per Appendix D in the Los Angeles County 2010 CMP, the background traffic growth estimates for Horizon Year must use the generalized growth factor (at a minimum) shown in Exhibit D-1 of the LA CMP. Based on Exhibit D-1 of the LA CMP, a general traffic volume growth factor of 1.106 is used for cities (including Irwindale) within the Regional Statistical Area (RSA) 26 for Horizon Year 2035. Therefore, Long Range baseline volumes were developed by applying a general growth factor of 1.106 to existing volumes to reflect 2035 conditions, as identified in the Los Angeles County CMP, in addition to the cumulative project / other development data.

Appendix "I" of this report contains the relevant excerpts from the Los Angeles County CMP traffic impact analysis guidelines.

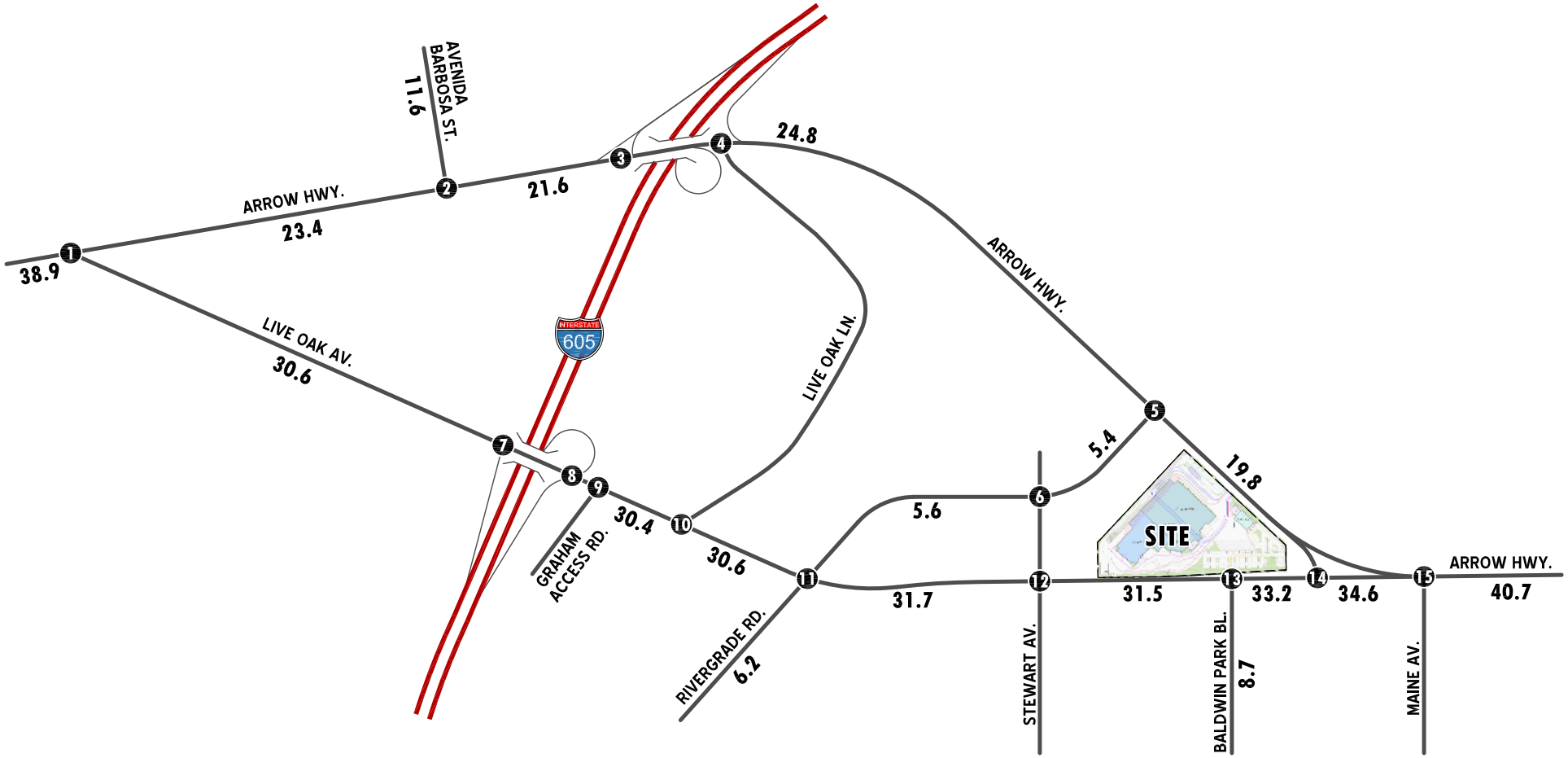
Exhibit 4-N, Exhibit 4-O, and Exhibit 4-P present the Long Range (2035) Without Project ADT, AM peak hour, and PM peak hour traffic volumes, respectively. As shown on these exhibits, Live Oak Avenue, west of Arrow Highway (North) is projected to carry approximately 38,900 vpd.

4.5 Long Range (2035) With Project

For Long Range (2035) With Project conditions, "project only" traffic volumes were added to the Long Range (2035) Without Project volumes described above. Exhibit 4-Q, Exhibit 4-R, and 4-S present the Long Range (2035) with Project ADT, AM peak hour, and PM peak hour traffic volumes, respectively. As shown on these exhibits, Live Oak Avenue, west of Arrow Highway (North) is projected to carry approximately 39,300 vpd. Arrow Highway adjacent to the project site is projected to carry between 26,900 and 20,400 VPD. The highest daily traffic volume in the study area is 41,100 VPD on Arrow Highway east of Maine Avenue.

EXHIBIT 4-N

LONG RANGE HORIZON YEAR (2035) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 4-O

LONG RANGE HORIZON YEAR (2035) WITHOUT PROJECT AM PEAK HOUR INTERSECTION VOLUMES

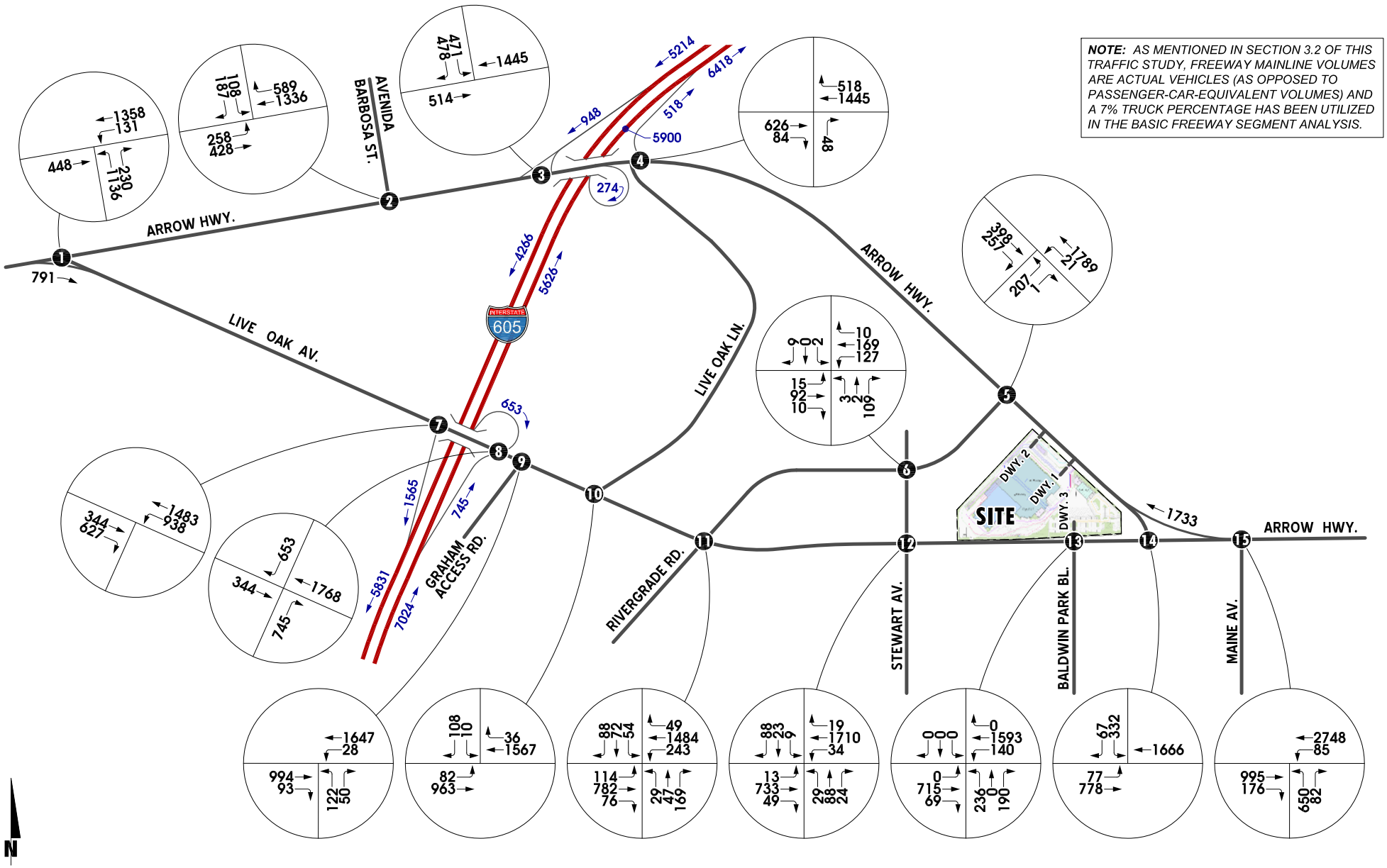


EXHIBIT 4-P

LONG RANGE HORIZON YEAR (2035) WITHOUT PROJECT PM PEAK HOUR INTERSECTION VOLUMES

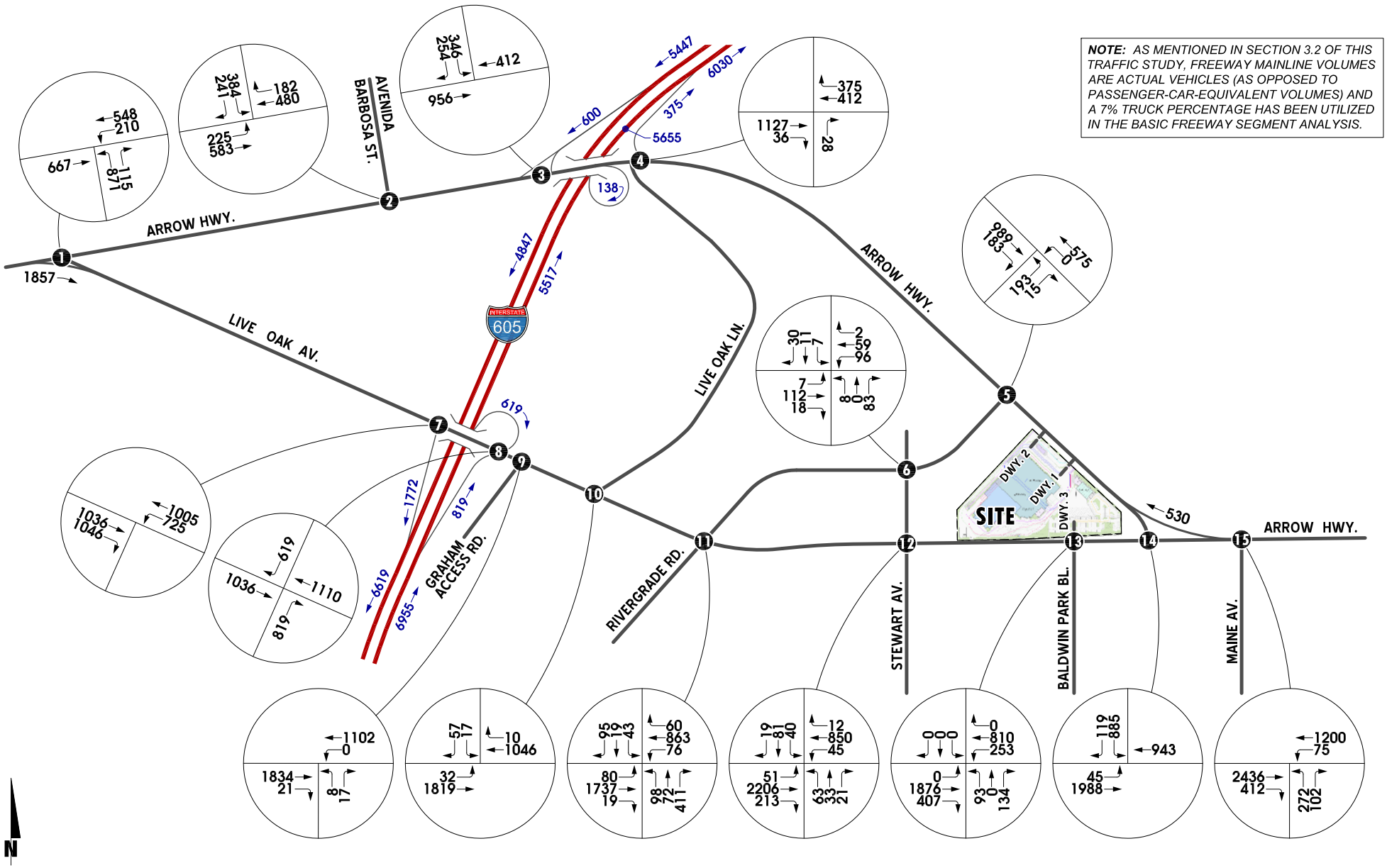
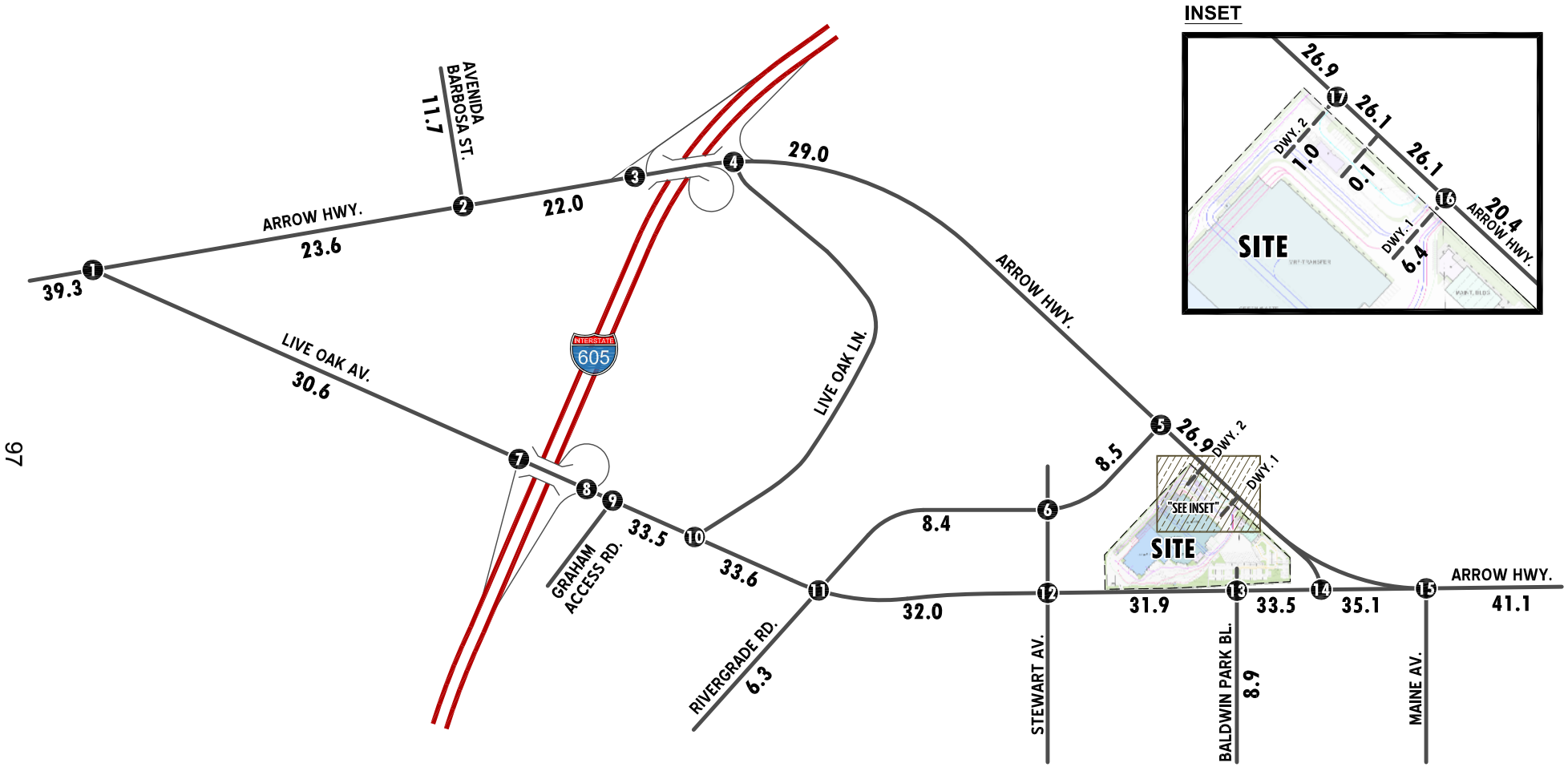


EXHIBIT 4-Q

LONG RANGE HORIZON YEAR (2035) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)



97

LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 4-R

LONG RANGE HORIZON YEAR (2035) WITH PROJECT AM PEAK HOUR INTERSECTION VOLUMES

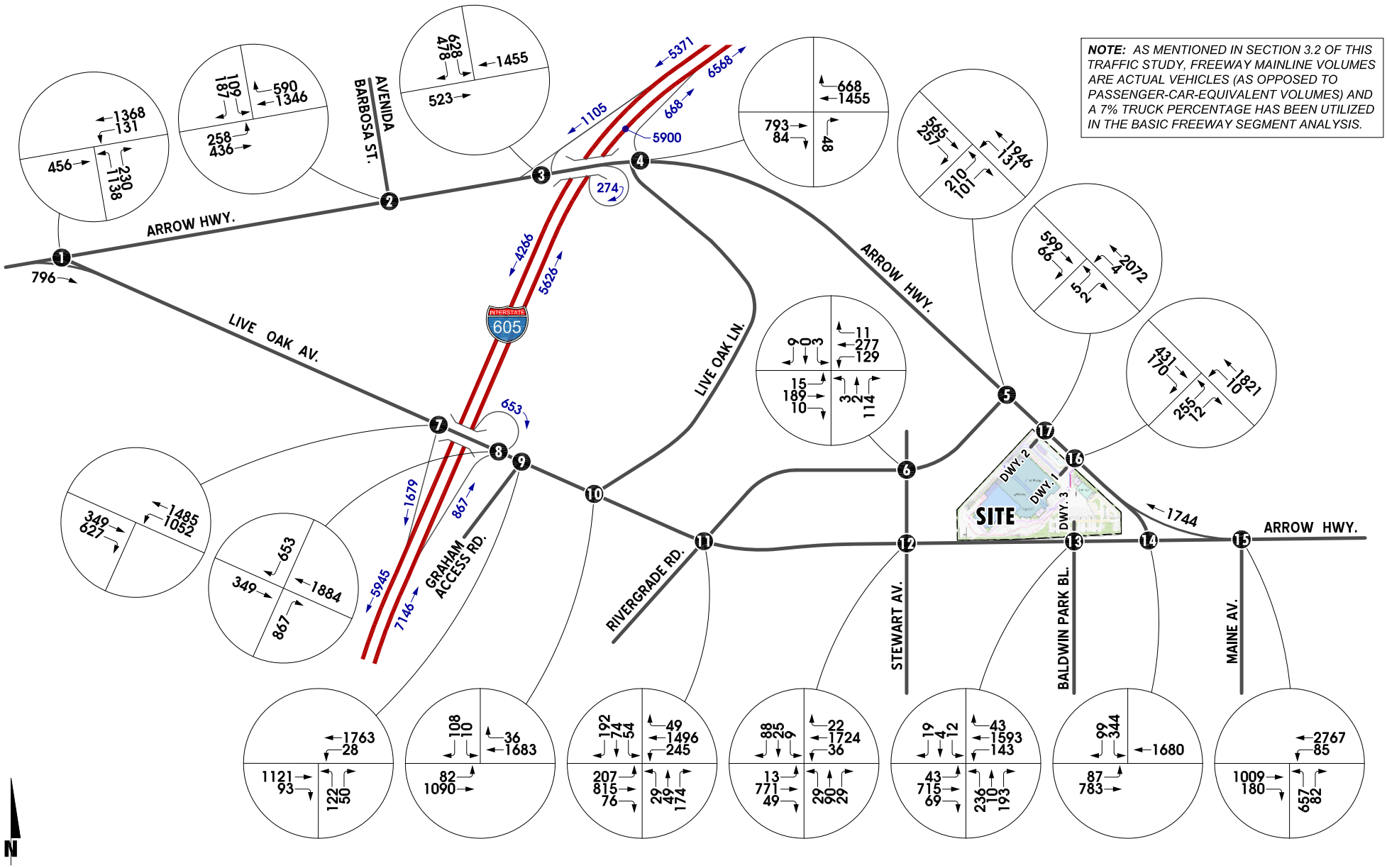
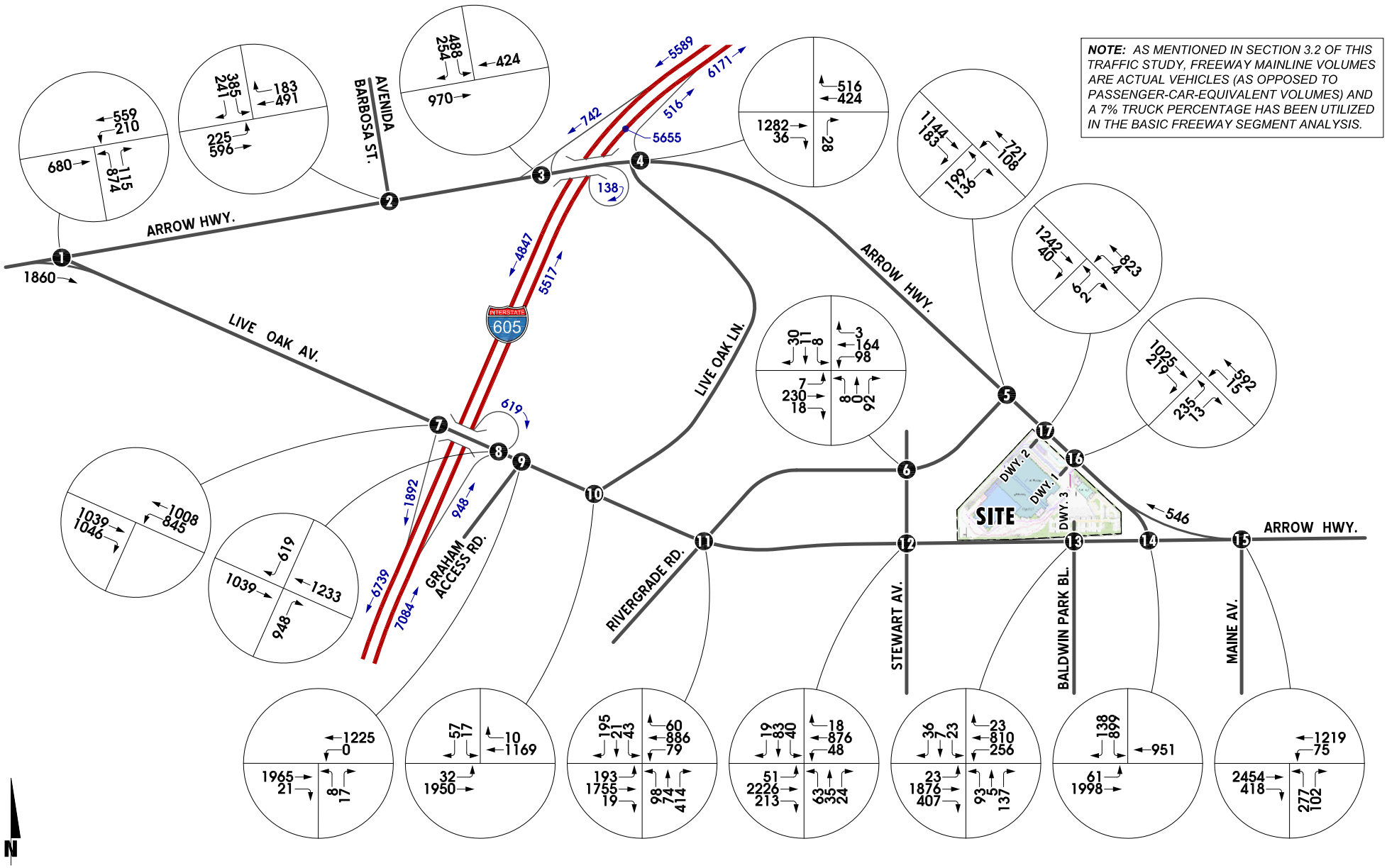


EXHIBIT 4-S

LONG RANGE HORIZON YEAR (2035) WITH PROJECT PM PEAK HOUR INTERSECTION VOLUMES



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5.0 TRAFFIC ANALYSIS

5.1 Delay, Capacity, Level of Service, and Improvements.

5.1.1 Existing Plus Project

HCM delay and ICU calculations for Existing Plus Project conditions are shown in Table 5-1. The operation analysis worksheets are included in Appendix "J". Table 5-1 shows the operations analysis at the study area intersections with and without improvements. For Existing Plus Project conditions, the following study area intersection is anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Intersection Location	Jurisdiction
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

Table 5-2 provides a summary comparison of the intersection analysis operations for Existing (2013) and Existing Plus Project conditions. Table 5-2 also identifies any "significant impacts" (as defined in the City of Irwindale traffic study guidelines). As shown on Table 5-2, a significant impact is projected for the intersection of I-605 NB Off-Ramp and Live Oak Avenue, based on the minor approach operating conditions.

As shown in Table 5-1 and Table 5-2, the following improvements are necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's impact to *"less-than-significant":*

I-605 NB Off-Ramp (NS) / Live Oak Avenue (#8)

- Install a traffic signal.
- Construct a second northbound right turn lane.
- Provide a third westbound through lane by modifying the existing raised median.

TABLE 5-1

EXISTING PLUS PROJECT CONDITIONS
INTERSECTIONS ANALYSIS SUMMARY

#	INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	NORTH-BOUND T	NORTH-BOUND R	SOUTH-BOUND L	SOUTH-BOUND T	SOUTH-BOUND R	EAST-BOUND L	EAST-BOUND T	EAST-BOUND R	WEST-BOUND L	WEST-BOUND T	WEST-BOUND R	HCM DELAY[2] (SECS.) AM	HCM DELAY[2] (SECS.) PM	HCM LEVEL OF SERVICE[2] AM	HCM LEVEL OF SERVICE[2] PM	ICU[6] (V/C) AM	ICU[6] (V/C) PM	ICU[6] LEVEL OF SERVICE AM	ICU[6] LEVEL OF SERVICE PM
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	19.5	24.1	B	C	0.74	0.50	C	A
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	1	18.2	22.6	B	C	0.65	0.45	B	A
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	22.7	12.3	C	B	0.90	0.52	D	A
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.7	10.6	B	B	NA	NA	NA	NA
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)	TS	1	2	0	0	2	1	2	0	1	0	0	0	8.0	8.5	A	A	0.61	0.38	B	A
6	Stewart Av. (NS) / Rivergrade Rd. (EW)	TS	1	1	0	0	1	0	1	2	0	1	2	0	5.6	6.8	A	A	0.13	0.13	A	A
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	16.5	12.3	B	B	0.84	0.84	D	D
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)																					
	Without Improvements[4]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	17.9	25.1	C	D	NA	NA	NA	NA
	-NB Slip Off-Ramp to Live Oak Av. Eastbound[5]	CSS	0	0	1	--	--	--	0	2	0	0	2	0	19.1	64.2	C	F	NA	NA	NA	NA
	-NB loop Off-Ramp to Live Oak Av. Westbound[5]	CSS	--	--	--	0	0	1	0	2	0	0	2	0	74.6	55.3	F	F	NA	NA	NA	NA
	With Improvements	TS	0	0	2	--	--	1	0	2	0	0	3	0	17.6	19.7	B	B	0.82	0.69	D	B
9	Graham Access Rd. (NS) / Live Oak Av. (EW)	TS	0	1	0	0	0	0	0	2	d	1	2	0	6.2	2.4	A	A	0.63	0.61	B	B
10	Live Oak Ln. (NS) / Live Oak Av. (EW)	CSS	0	0	0	0	1	0	1	2	0	0	2	d	12.5	12.7	B	B	NA	NA	NA	NA
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)	TS	1	2	0	1	2	1	1	2	1	1	2	d	22.5	19.5	C	B	0.68	0.70	B	B
12	Stewart Av. (NS) / Live Oak Av. (EW)	TS	0	1	0	1	1	1	1	2	d	1	2	d	9.5	12.3	A	B	0.59	0.76	A	C
13	Baldwin Park Bl. - Dwy. 3 (NS) / Live Oak Av. (EW)	TS	2	1	0	1	1	0	1	2	d	1	2	1	18.5	24.7	B	C	0.62	0.79	B	C
14	Arrow Hwy. (NS) / Live Oak Av. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	9.0	20.2	A	C	0.53	0.81	A	D
15	Maine Av. (NS) / Arrow Hwy. (EW)	TS	2	0	1	0	0	0	0	2	d	1	3	0	14.5	19.5	B	B	0.74	0.76	C	C
16	Arrow Hwy. (NS) / Dwy. 1 (EW)	TS	1	2	0	0	2	1	1	0	1	0	0	0	13.4	11.7	B	B	0.70	0.45	B	A
17	Arrow Hwy. (NS) / Dwy. 2 (EW)	CSS	0	2	0	0	2	1	0	1	0	0	0	0	12.3	15.9	B	C	NA	NA	NA	NA

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width (23') for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; 1>> = Free Right Turn Lane; d = Defacto Right Turn Lane; 1 = Improvement

[2] Delay and level of service (LOS) calculated using the following analysis software: Synchro 8. Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown. "NA" value is shown for unsignalized ICU values.

[3] TS = Traffic Signal; CSS = Cross Street Stop.

[4] LOS based on average delay (unsignalized intersection).

[5] LOS based on minor approach operating condition (unsignalized intersection).

[6] The Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information.

* BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

TABLE 5-2

EXISTING AND EXISTING PLUS PROJECT
INTERSECTION ANALYSIS SUMMARY COMPARISON

#	INTERSECTION	TRAFFIC Control[3]	INTERSECTION APPROACH LANES[1]												HCM DELAY[2] (SECS.)		HCM LEVEL OF SERVICE[2]		ICU[7] (V/C)		ICU[7] LEVEL OF SERVICE		SIGNIFICANT IMPACT?[4]
			NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND											
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	AM	PM	AM	PM	
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)																						
	• Existing (2013)	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	19.5	24.2	B	C	0.74	0.50	C	A	
	• Existing + Project	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	19.5	24.1	B	C	0.74	0.50	C	A	NO
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)																						
	• Existing (2013)	TS	0	0	0	2	0	1	1	2	0	0	2	1	18.2	22.7	B	C	0.65	0.44	B	A	
	• Existing + Project	TS	0	0	0	2	0	1	1	2	0	0	2	1	18.2	22.6	B	C	0.65	0.45	B	A	NO
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)																						
	• Existing (2013)	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	12.4	8.4	B	A	0.78	0.41	C	A	
	• Existing + Project	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	22.7	12.3	C	B	0.90	0.52	D	A	NO
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)																						
	• Existing (2013)	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.1	10.3	B	B	NA	NA	NA	NA	
	• Existing + Project	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.7	10.6	B	B	NA	NA	NA	NA	NO
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)																						
	• Existing (2013)	TS	1	2	0	0	2	1	2	0	1	0	0	0	5.9	6.7	A	A	0.56	0.32	A	A	
	• Existing + Project	TS	1	2	0	0	2	1	2	0	1	0	0	0	8.0	8.5	A	A	0.61	0.38	B	A	NO
6	Stewart Av. (NS) / Rivergrade Rd. (EW)																						
	• Existing (2013)	TS	1	1	0	0	1	0	1	2	0	1	2	0	7.3	9.8	A	A	0.11	0.11	A	A	
	• Existing + Project	TS	1	1	0	0	1	0	1	2	0	1	2	0	5.6	6.8	A	A	0.13	0.13	A	A	NO
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)																						
	• Existing (2013)	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	8.4	11.0	A	B	0.76	0.78	C	C	
	• Existing + Project	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	16.5	12.3	B	B	0.84	0.84	D	D	NO

TABLE 5-2

EXISTING AND EXISTING PLUS PROJECT
INTERSECTION ANALYSIS SUMMARY COMPARISON

#	INTERSECTION	TRAFFIC Control[3]	INTERSECTION APPROACH LANES[1]												HCM DELAY[2] (SECS.)		HCM LEVEL OF SERVICE[2]		ICU[7] (V/C)		ICU[7] LEVEL OF SERVICE		SIGNIFICANT IMPACT?[4]
			NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND											
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	AM	PM	AM	PM	
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)																						
	• Existing (2013)[5]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	17.6	15.0	C	B	NA	NA	NA	NA	
	• Existing + Project[5]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	17.9	25.1	C	D	NA	NA	NA	NA	NO
	- With Improvements	TS	0	0	2	--	--	1	0	2	0	0	3	0	17.6	19.7	B	B	0.82	0.69	D	B	NO
	-NB Slip Off-Ramp to Live Oak Av. Eastbound[6]																						
	• Existing (2013)	CSS	0	0	1	--	--	--	0	2	0	0	2	0	14.4	31.5	B	D	NA	NA	NA	NA	
	• Existing + Project	CSS	0	0	1	--	--	--	0	2	0	0	2	0	19.1	64.2	C	F	NA	NA	NA	NA	YES
	-NB loop Off-Ramp to Live Oak Av. Westbound[6]																						
	• Existing (2013)	CSS	--	--	--	0	0	1	0	2	0	0	2	0	74.8	43.9	F	E	NA	NA	NA	NA	
	• Existing + Project	CSS	--	--	--	0	0	1	0	2	0	0	2	0	74.6	55.3	F	F	NA	NA	NA	NA	YES
9	Graham Access Rd. (NS) / Live Oak Av. (EW)																						
	• Existing (2013)	TS	0	1	0	0	0	0	0	2	d	1	2	0	5.9	2.1	A	A	0.59	0.56	A	A	
	• Existing + Project	TS	0	1	0	0	0	0	0	2	d	1	2	0	6.2	2.4	A	A	0.63	0.61	B	B	NO
10	Live Oak Ln. (NS) / Live Oak Av. (EW)																						
	• Existing (2013)	CSS	0	0	0	0	1	0	1	2	0	0	2	d	12.2	14.0	B	B	NA	NA	NA	NA	
	• Existing + Project	CSS	0	0	0	0	1	0	1	2	0	0	2	d	12.5	12.7	B	B	NA	NA	NA	NA	NO
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)																						
	• Existing (2013)	TS	1	2	0	1	2	1	1	2	1	1	2	d	17.6	17.2	B	B	0.62	0.74	B	C	
	• Existing + Project	TS	1	2	0	1	2	1	1	2	1	1	2	d	22.5	19.5	C	B	0.68	0.70	B	B	NO
12	Stewart Av. (NS) / Live Oak Av. (EW)																						
	• Existing (2013)	TS	0	1	0	1	1	1	1	2	d	1	2	d	8.8	11.9	A	B	0.58	0.75	A	C	
	• Existing + Project	TS	0	1	0	1	1	1	1	2	d	1	2	d	9.5	12.3	A	B	0.59	0.76	A	C	NO
13	Baldwin Park Bl. - Dwy. 3 (NS) / Live Oak Av. (EW)																						
	• Existing (2013)	TS	2	0	1	0	0	0	0	2	d	1	2	0	11.2	16.5	B	B	0.55	0.75	A	C	
	• Existing + Project	TS	2	1	0	1	1	0	1	2	d	1	2	1	18.5	24.7	B	C	0.62	0.79	B	C	NO

TABLE 5-2

EXISTING AND EXISTING PLUS PROJECT
INTERSECTION ANALYSIS SUMMARY COMPARISON

#	INTERSECTION	TRAFFIC Control[3]	INTERSECTION APPROACH LANES[1]												HCM DELAY[2] (SECS.)		HCM LEVEL OF SERVICE[2]		ICU[7] (V/C)		ICU[7] LEVEL OF SERVICE		SIGNIFICANT IMPACT?[4]
			NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND											
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	AM	PM	AM	PM	
14	Arrow Hwy. (NS) / Live Oak Av. (EW)																						
	• Existing (2013)	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	7.0	22.1	A	C	0.53	0.81	A	D	
	• Existing + Project	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	9.0	20.2	A	C	0.53	0.81	A	D	NO
15	Maine Av. (NS) / Arrow Hwy. (EW)																						
	• Existing (2013)	TS	2	0	1	0	0	0	0	2	d	1	3	0	14.4	19.0	B	B	0.73	0.75	C	C	
	• Existing + Project	TS	2	0	1	0	0	0	0	2	d	1	3	0	14.5	19.5	B	B	0.74	0.76	C	C	NO
16	Arrow Hwy. (NS) / Dwy. 1 (EW)																						
	• Existing (2013)	-	DOES NOT EXIST												-	-	-	-	-	-	-	-	
	• Existing + Project	TS	1	2	0	0	2	1	1	0	1	0	0	0	13.4	11.7	B	B	0.70	0.45	B	A	NO
17	Arrow Hwy. (NS) / Dwy. 2 (EW)																						
	• Existing (2013)	-	DOES NOT EXIST												-	-	-	-	-	-	-	-	
	• Existing + Project	CSS	0	2	0	0	2	1	0	1	0	0	0	0	12.3	15.9	B	C	NA	NA	NA	NA	NO

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1 When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width (23') for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; 1>> = Free Right Turn Lane; d = Defacto Right Turn Lane; 1 = Improvement

2 Delay and level of service calculated using the following analysis software: Synchro 8. Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown. "NA" value is shown for unsignalized ICU values.

3 TS = Traffic Signal; CSS = Cross Street Stop.

4 Per City of Irwindale traffic study guidelines, a significant impact is identified if one of the following criterias are met:
- For Signalized Intersections
  - When an intersection operates at acceptable LOS ("D" or better) for baseline conditions and the addition of project results in unacceptable LOS ("E" or "F").
  - When a State Highway intersection operates at acceptable LOS ("E" or better) for baseline conditions and the addition of project results in unacceptable LOS "F".
  - When an intersection operates at LOS "F" for baseline conditions and the project adds more than 50 peak hour project trips .
- For Unsignalized Intersections
  - When the minor stop-contolled approach operates at LOS "F" and does not have acceptable LOS in terms of average delay, and the addition of project increases the total control delay to more than 4.0 hours for single lane approach and 5.0 hours for multilane approach.

5 LOS based on average delay (unsignalized intersection).

6 LOS based on minor approach operating condition (unsignalized intersection).

7 The Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information.

* **BOLD** = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

5.1.2 Interim Year (2016) Without Project

HCM delay and ICU calculations for Interim Year (2016) Without Project conditions are shown in Table 5-3. The operation analysis worksheets are included in Appendix "K". Table 5-3 shows the operations analysis at the study area intersections with and without improvements. For Interim Year (2016) Without Project conditions, the following study area intersection is projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Intersection Location	Jurisdiction
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

Even though the ICU results show that intersection of Arrow Highway / Live Oak Avenue (#14) operates at LOS "E" with 0.91 v/c during the PM peak hour under Interim Year (2016) Without Project, the HCM results show that the intersection operates at acceptable LOS (LOS "D" or better). The HCM results present a more accurate representation of the intersection operational level.

5.1.3 Interim Year (2016) With Project

HCM delay and ICU calculations for Interim Year (2016) With Project conditions are shown in Table 5-4. The operation analysis worksheets are included in Appendix "L". Table 5-4 shows the operations analysis at the study area intersections with and without improvements. For Interim (2016) With Project conditions, no additional intersection is projected to operate at unacceptable level of service compared to Interim Year (2016) Without Project conditions.

It should be noted that even though the ICU results show that the intersections of I-605 SB off-ramp / Arrow Highway (#3), I-605 SB On-Ramp / Live Oak Avenue (#7), and Arrow Highway / Live Oak Avenue (#14) operates at LOS "E" during peak hours under Interim Year (2016) With Project conditions. However, the HCM

TABLE 5-3

INTERIM YEAR (2016) WITHOUT PROJECT CONDITIONS
INTERSECTIONS ANALYSIS SUMMARY

#	INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	NORTH-BOUND T	NORTH-BOUND R	SOUTH-BOUND L	SOUTH-BOUND T	SOUTH-BOUND R	EAST-BOUND L	EAST-BOUND T	EAST-BOUND R	WEST-BOUND L	WEST-BOUND T	WEST-BOUND R	HCM DELAY[2] (SECS.) AM	HCM DELAY[2] (SECS.) PM	HCM LEVEL OF SERVICE[2] AM	HCM LEVEL OF SERVICE[2] PM	ICU[6] (V/C) AM	ICU[6] (V/C) PM	ICU[6] LEVEL OF SERVICE AM	ICU[6] LEVEL OF SERVICE PM
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	20.5	24.1	C	C	0.80	0.56	C	A
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	1	19.4	23.1	B	C	0.70	0.49	B	A
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	16.1	9.7	B	A	0.87	0.49	D	A
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.7	10.5	B	B	NA	NA	NA	NA
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)	TS	1	2	0	0	2	1	2	0	1	0	0	0	7.0	7.0	A	A	0.62	0.38	B	A
6	Stewart Av. (NS) / Rivergrade Rd. (EW)	TS	1	1	0	0	1	0	1	2	0	1	2	0	7.0	9.1	A	A	0.13	0.12	A	A
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	15.5	15.1	B	B	0.85	0.85	D	D
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)																					
	Without Improvements[4]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	18.4	27.4	C	D	NA	NA	NA	NA
	-NB Slip Off-Ramp to Live Oak Av. Eastbound[5]	CSS	0	0	1	--	--	--	0	2	0	0	2	0	18.1	64.0	C	F	NA	NA	NA	NA
	-NB loop Off-Ramp to Live Oak Av. Westbound[5]	CSS	--	--	--	0	0	1	0	2	0	0	2	0	78.3	73.9	F	F	NA	NA	NA	NA
	With Improvements	TS	0	0	2	--	--	1	0	2	0	0	3	0	21.3	19.7	C	B	0.86	0.69	D	B
9	Graham Access Rd. (NS) / Live Oak Av. (EW)	TS	0	1	0	0	0	0	0	2	d	1	2	0	6.4	2.6	A	A	0.66	0.63	B	B
10	Live Oak Ln. (NS) / Live Oak Av. (EW)	CSS	0	0	0	0	1	0	1	2	0	0	2	d	14.3	15.2	B	C	NA	NA	NA	NA
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)	TS	1	2	0	1	2	1	1	2	1	1	2	d	23.1	25.0	C	C	0.75	0.78	C	C
12	Stewart Av. (NS) / Live Oak Av. (EW)	TS	0	1	0	1	1	1	1	2	d	1	2	d	10.1	16.7	B	B	0.64	0.82	B	D
13	Baldwin Park Bl. - Dwy. 3 (NS) / Live Oak Av. (EW)	TS	2	0	1	0	0	0	0	2	d	1	2	0	12.7	19.9	B	B	0.61	0.82	B	D
14	Arrow Hwy. (NS) / Live Oak Av. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	8.7	28.9	A	C	0.60	0.91	A	E
15	Maine Av. (NS) / Arrow Hwy. (EW)	TS	2	0	1	0	0	0	0	2	d	1	3	0	16.0	36.4	B	D	0.80	0.85	C	D
16	Arrow Hwy. (NS) / Dwy. 1 (EW)	-	DOES NOT EXIST												-	-	-	-	-	-	-	-
17	Arrow Hwy. (NS) / Dwy. 2 (EW)	-	DOES NOT EXIST												-	-	-	-	-	-	-	-

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width (23') for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; 1>> = Free Right Turn Lane; d = Defacto Right Turn Lane; 1 = Improvement

[2] Delay and level of service (LOS) calculated using the following analysis software: Synchro 8. Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown. "NA" value is shown for unsignalized ICU values.

[3] TS = Traffic Signal; CSS = Cross Street Stop.

[4] LOS based on average delay (unsignalized intersection).

[5] LOS based on minor approach operating condition (unsignalized intersection).

[6] The Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information.

* BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

TABLE 5-4

INTERIM YEAR (2016) WITH PROJECT CONDITIONS
INTERSECTIONS ANALYSIS SUMMARY

#	INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	T	R	SOUTH-BOUND L	T	R	EAST-BOUND L	T	R	WEST-BOUND L	T	R	HCM DELAY[2] (SECS.) AM	PM	HCM LEVEL OF SERVICE[2] AM	PM	ICU[6] (V/C) AM	PM	ICU[6] LEVEL OF SERVICE AM	PM
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	20.5	24.1	C	C	0.81	0.57	D	A
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	1	19.5	23.1	B	C	0.71	0.50	C	A
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	34.1	15.0	C	B	0.99	0.60	E	A
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.9	10.9	B	B	NA	NA	NA	NA
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)	TS	1	2	0	0	2	1	2	0	1	0	0	0	7.9	8.8	A	A	0.67	0.43	B	A
6	Stewart Av. (NS) / Rivergrade Rd. (EW)	TS	1	1	0	0	1	0	1	2	0	1	2	0	5.7	6.8	A	A	0.14	0.14	A	A
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	30.7	17.7	C	B	0.93	0.94	E	E
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)																					
	Without Improvements[4]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	17.5	46.0	C	E	NA	NA	NA	NA
	-NB Slip Off-Ramp to Live Oak Av. Eastbound[5]	CSS	0	0	1	--	--	--	0	2	0	0	2	0	27.7	124.8	D	F	NA	NA	NA	NA
	-NB loop Off-Ramp to Live Oak Av. Westbound[5]	CSS	--	--	--	0	0	1	0	2	0	0	2	0	64.1	93.7	F	F	NA	NA	NA	NA
	With Improvements	TS	0	0	2	--	--	1	0	2	0	0	3	0	21.8	21.5	C	C	0.89	0.75	D	C
9	Graham Access Rd. (NS) / Live Oak Av. (EW)	TS	0	1	0	0	0	0	0	2	d	1	2	0	6.9	2.9	A	A	0.70	0.67	B	B
10	Live Oak Ln. (NS) / Live Oak Av. (EW)	CSS	0	0	0	0	1	0	1	2	0	0	2	d	15.1	13.0	C	B	NA	NA	NA	NA
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)	TS	1	2	0	1	2	1	1	2	1	1	2	d	30.9	27.3	C	C	0.80	0.79	C	C
12	Stewart Av. (NS) / Live Oak Av. (EW)	TS	0	1	0	1	1	1	1	2	d	1	2	d	10.8	17.6	B	B	0.65	0.83	B	D
13	Baldwin Park Bl. - Dwy. 3 (NS) / Live Oak Av. (EW)	TS	2	1	0	1	1	0	1	2	d	1	2	1	18.2	27.2	B	C	0.69	0.86	B	D
14	Arrow Hwy. (NS) / Live Oak Av. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	9.4	29.3	A	C	0.60	0.91	A	E
15	Maine Av. (NS) / Arrow Hwy. (EW)	TS	2	0	1	0	0	0	0	2	d	1	3	0	16.2	38.0	B	D	0.81	0.85	D	D
16	Arrow Hwy. (NS) / Dwy. 1 (EW)	TS	1	2	0	0	2	1	1	0	1	0	0	0	13.2	11.0	B	B	0.75	0.49	C	A
17	Arrow Hwy. (NS) / Dwy. 2 (EW)	CSS	0	2	0	0	2	1	0	1	0	0	0	0	12.6	17.6	B	C	NA	NA	NA	NA

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width (23') for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; 1>> = Free Right Turn Lane; d = Defacto Right Turn Lane; 1 = Improvement

[2] Delay and level of service (LOS) calculated using the following analysis software: Synchro 8. Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown. "NA" value is shown for unsignalized ICU values.

[3] TS = Traffic Signal; CSS = Cross Street Stop.

[4] LOS based on average delay (unsignalized intersection).

[5] LOS based on minor approach operating condition (unsignalized intersection).

[6] The Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information.

* BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

results show that these intersections operate at acceptable LOS (LOS "D" or better). The HCM results present a more accurate representation of the intersection operational level.

Table 5-5 summarizes the intersection analysis operations for Interim Year (2016) Without Project and Interim Year With Project conditions. Table 5-5 also identifies any "significant impacts" (as defined in the City of Irwindale traffic study guidelines). As shown on Table 5-5, a significant impact is projected for the intersection of I-605 NB Off-Ramp and Live Oak Avenue.

As shown in Table 5-4 and Table 5-5, the following improvements are necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's impact to *"less-than-significant":*

I-605 NB Off-Ramp (NS) / Live Oak Avenue (#8)

- Install a traffic signal.
- Construct a second northbound right turn lane.
- Provide a third westbound through lane by removing the existing raised median.

5.1.4 Long Range (2035) Without Project

HCM delay and ICU calculations for Long Range (2035) Without Project conditions are shown in Table 5-6. The operation analysis worksheets are included in Appendix "M". Table 5-6 shows the operations analysis at the study area intersections with and without improvements. For Long Range (2035) Without Project conditions the following study area intersection is projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Intersection Location	Jurisdiction
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

TABLE 5-5

INTERIM YEAR (2016)

INTERSECTION ANALYSIS SUMMARY COMPARISON

#	INTERSECTION	TRAFFIC Control[3]	INTERSECTION APPROACH LANES[1]												HCM DELAY[2] (SECS.)		HCM LEVEL OF SERVICE[2]		ICU[8] (V/C)		ICU[8] LEVEL OF SERVICE		SIGNIFICANT IMPACT?[5]
			NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND											
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	AM	PM	AM	PM	
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)																						
	• 2016 Without Project	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	20.5	24.1	C	C	0.80	0.56	C	A	
	• 2016 With Project	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	20.5	24.1	C	C	0.81	0.57	D	A	NO
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)																						
	• 2016 Without Project	TS	0	0	0	2	0	1	1	2	0	0	2	1	19.4	23.1	B	C	0.70	0.49	B	A	
	• 2016 With Project	TS	0	0	0	2	0	1	1	2	0	0	2	1	19.5	23.1	B	C	0.71	0.50	C	A	NO
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)																						
	• 2016 Without Project	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	16.1	9.7	B	A	0.87	0.49	D	A	
	• 2016 With Project	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	34.1	15.0	C	B	0.99	0.60	E	A	NO
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)																						
	• 2016 Without Project	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.7	10.5	B	B	NA	NA	NA	NA	
	• 2016 With Project	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.9	10.9	B	B	NA	NA	NA	NA	NO
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)																						
	• 2016 Without Project	TS	1	2	0	0	2	1	2	0	1	0	0	0	7.0	7.0	A	A	0.62	0.38	B	A	
	• 2016 With Project	TS	1	2	0	0	2	1	2	0	1	0	0	0	7.9	8.8	A	A	0.67	0.43	B	A	NO
6	Stewart Av. (NS) / Rivergrade Rd. (EW)																						
	• 2016 Without Project	TS	1	1	0	0	1	0	1	2	0	1	2	0	7.0	9.1	A	A	0.13	0.12	A	A	
	• 2016 With Project	TS	1	1	0	0	1	0	1	2	0	1	2	0	5.7	6.8	A	A	0.14	0.14	A	A	NO
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)																						
	• 2016 Without Project	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	15.5	15.1	B	B	0.85	0.85	D	D	
	• 2016 With Project	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	30.7	17.7	C	B	0.93	0.94	E	E	NO

TABLE 5-5

INTERIM YEAR (2016)

INTERSECTION ANALYSIS SUMMARY COMPARISON

#	INTERSECTION	TRAFFIC Control[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	T	R	SOUTH-BOUND L	T	R	EAST-BOUND L	T	R	WEST-BOUND L	T	R	HCM DELAY[2] (SECS.) AM	PM	HCM LEVEL OF SERVICE[2] AM	PM	ICU[8] (V/C) AM	PM	ICU[8] LEVEL OF SERVICE AM	PM	SIGNIFICANT IMPACT?[5]
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)																							
	• 2016 Without Project[6]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	18.4	27.4	C	D	NA	NA	NA	NA	
	• 2016 With Project[6]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	17.5	46.0	C	E	NA	NA	NA	NA	NO
	- With Improvements[6]	TS	0	0	2	--	--	1	0	2	0	0	3	0	21.8	--[4]	C	C	0.89	0.75	D	C	NO
	-NB Slip Off-Ramp to Live Oak Av. Eastbound[7]																						
	• 2016 Without Project	CSS	0	0	1	--	--	--	0	2	0	0	2	0	18.1	64.0	C	F	NA	NA	NA	NA	
	• 2016 With Project	CSS	0	0	1	--	--	--	0	2	0	0	2	0	27.7	--[4]	D	F	NA	NA	NA	NA	YES
	-NB loop Off-Ramp to Live Oak Av. Westbound[7]																						
	• 2016 Without Project	CSS	--	--	--	0	0	1	0	2	0	0	2	0	78.3	73.9	F	F	NA	NA	NA	NA	
	• 2016 With Project	CSS	--	--	--	0	0	1	0	2	0	0	2	0	64.1	93.7	F	F	NA	NA	NA	NA	YES
9	Graham Access Rd. (NS) / Live Oak Av. (EW)																						
	• 2016 Without Project	TS	0	1	0	0	0	0	0	2	d	1	2	0	6.4	2.6	A	A	0.66	0.63	B	B	
	• 2016 With Project	TS	0	1	0	0	0	0	0	2	d	1	2	0	6.9	2.9	A	A	0.70	0.67	B	B	NO
10	Live Oak Ln. (NS) / Live Oak Av. (EW)																						
	• 2016 Without Project	CSS	0	0	0	0	1	0	1	2	0	0	2	d	14.3	15.2	B	C	NA	NA	NA	NA	
	• 2016 With Project	CSS	0	0	0	0	1	0	1	2	0	0	2	d	15.1	13.0	C	B	NA	NA	NA	NA	NO
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)																						
	• 2016 Without Project	TS	1	2	0	1	2	1	1	2	1	1	2	d	23.1	25.0	C	C	0.75	0.78	C	C	
	• 2016 With Project	TS	1	2	0	1	2	1	1	2	1	1	2	d	30.9	27.3	C	C	0.80	0.79	C	C	NO
12	Stewart Av. (NS) / Live Oak Av. (EW)																						
	• 2016 Without Project	TS	0	1	0	1	1	1	1	2	d	1	2	d	10.1	16.7	B	B	0.64	0.82	B	D	
	• 2016 With Project	TS	0	1	0	1	1	1	1	2	d	1	2	d	10.8	17.6	B	B	0.65	0.83	B	D	NO
13	Baldwin Park Bl. - Dwy. 3 (NS) / Live Oak Av. (EW)																						
	• 2016 Without Project	TS	2	0	1	0	0	0	0	2	d	1	2	0	12.7	19.9	B	B	0.61	0.82	B	D	
	• 2016 With Project	TS	2	1	0	1	1	0	1	2	d	1	2	1	18.2	27.2	B	C	0.69	0.86	B	D	NO

TABLE 5-5

INTERIM YEAR (2016)

INTERSECTION ANALYSIS SUMMARY COMPARISON

#	INTERSECTION	TRAFFIC Control[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	T	R	SOUTH-BOUND L	T	R	EAST-BOUND L	T	R	WEST-BOUND L	T	R	HCM DELAY[2] (SECS.) AM	PM	HCM LEVEL OF SERVICE[2] AM	PM	ICU[8] (V/C) AM	PM	ICU[8] LEVEL OF SERVICE AM	PM	SIGNIFICANT IMPACT?[5]
14	Arrow Hwy. (NS) / Live Oak Av. (EW)																						
	• 2016 Without Project	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	8.7	28.9	A	C	0.60	0.91	A	E	
	• 2016 With Project	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	9.4	29.3	A	C	0.60	0.91	A	E	NO
15	Maine Av. (NS) / Arrow Hwy. (EW)																						
	• 2016 Without Project	TS	2	0	1	0	0	0	0	2	d	1	3	0	16.0	36.4	B	D	0.80	0.85	C	D	
	• 2016 With Project	TS	2	0	1	0	0	0	0	2	d	1	3	0	16.2	38.0	B	D	0.81	0.85	D	D	NO
16	Arrow Hwy. (NS) / Dwy. 1 (EW)																						
	• 2016 Without Project	-	DOES NOT EXIST												-	-	-	-	-	-	-	-	
	• 2016 With Project	TS	1	2	0	0	2	1	1	0	1	0	0	0	13.2	11.0	B	B	0.75	0.49	C	A	NO
17	Arrow Hwy. (NS) / Dwy. 2 (EW)																						
	• 2016 Without Project	-	DOES NOT EXIST												-	-	-	-	-	-	-	-	
	• 2016 With Project	CSS	0	2	0	0	2	1	0	1	0	0	0	0	12.6	17.6	B	C	NA	NA	NA	NA	NO

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width (23') for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; 1>> = Free Right Turn Lane; d = Defacto Right Turn Lane; 1 = Improvement

[2] Delay and level of service calculated using the following analysis software: Synchro 8. Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown. "NA" value is shown for unsignalized ICU values.

[3] TS = Traffic Signal; CSS = Cross Street Stop.

[4] -- = Delay High (>100.0 secs.) or V/C Ratio exceeding 1.0, Intersection Unstable, Level of Service "F".

[5] Per City of Irwindale traffic study guidelines, a significant impact is identified if one of the following criterias are met:
- For Signalized Intersections
  - When an intersection operates at acceptable LOS ("D" or better) for baseline conditions and the addition of project results in unacceptable LOS ("E" or "F").
  - When a State Highway intersection operates at acceptable LOS ("E" or better) for baseline conditions and the addition of project results in unacceptable LOS "F".
  - When an intersection operates at LOS "F" for baseline conditions and the project adds more than 50 peak hour project trips .
- For Unsignalized Intersections
  - When the minor stop-contolled approach operates at LOS "F" and does not have acceptable LOS in terms of average delay, and the addition of project increases the total control delay to more than 4.0 hours for single lane approach and 5.0 hours for multilane approach.

[6] LOS based on average delay (unsignalized intersection).

[7] LOS based on minor approach operating condition (unsignalized intersection).

[8] The Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information.

* BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

TABLE 5-6

LONG RANGE (2035) WITHOUT PROJECT CONDITIONS
INTERSECTIONS ANALYSIS SUMMARY

#	INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	T	R	SOUTH-BOUND L	T	R	EAST-BOUND L	T	R	WEST-BOUND L	T	R	HCM DELAY[2] (SECS.) AM	PM	HCM LEVEL OF SERVICE[2] AM	PM	ICU[6] (V/C) AM	PM	ICU[6] LEVEL OF SERVICE AM	PM
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	21.2	24.4	C	C	0.84	0.58	D	A
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	1	20.7	24.0	C	C	0.73	0.51	C	A
	- Without Improvements	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	18.0	10.0	B	A	0.90	0.51	D	A
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.8	10.6	B	B	NA	NA	NA	NA
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)	TS	1	2	0	0	2	1	2	0	1	0	0	0	7.4	7.1	A	A	0.64	0.40	B	A
6	Stewart Av. (NS) / Rivergrade Rd. (EW)	TS	1	1	0	0	1	0	1	2	0	1	2	0	7.0	9.2	A	A	0.13	0.13	A	A
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	19.1	18.1	B	B	0.88	0.89	D	D
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)																					
	Without Improvements[4]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	14.2	32.9	B	D	NA	NA	NA	NA
	-NB Slip Off-Ramp to Live Oak Av. Eastbound[5]	CSS	0	0	1	--	--	--	0	2	0	0	2	0	19.9	82.2	C	F	NA	NA	NA	NA
	-NB loop Off-Ramp to Live Oak Av. Westbound[5]	CSS	--	--	--	0	0	1	0	2	0	0	2	0	53.8	81.6	F	F	NA	NA	NA	NA
	With Improvements	TS	0	0	2	--	--	1	0	2	0	0	3	0	22.7	16.1	C	B	0.90	0.78	D	C
9	Graham Access Rd. (NS) / Live Oak Av. (EW)	TS	0	1	0	0	0	0	0	2	d	1	2	0	7.2	2.8	A	A	0.68	0.65	B	B
10	Live Oak Ln. (NS) / Live Oak Av. (EW)	CSS	0	0	0	0	1	0	1	2	0	0	2	d	14.6	14.8	B	B	NA	NA	NA	NA
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)	TS	1	2	0	1	2	1	1	2	1	1	2	d	23.6	27.6	C	C	0.77	0.82	C	D
12	Stewart Av. (NS) / Live Oak Av. (EW)	TS	0	1	0	1	1	1	1	2	d	1	2	d	10.9	19.6	B	B	0.67	0.86	B	D
13	Baldwin Park Bl. - Dwy. 3 (NS) / Live Oak Av. (EW)	TS	2	0	1	0	0	0	0	2	d	1	2	0	12.7	21.2	B	C	0.63	0.85	B	D
14	Arrow Hwy. (NS) / Live Oak Av. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	8.8	32.1	A	C	0.62	0.94	B	E
15	Maine Av. (NS) / Arrow Hwy. (EW)	TS	2	0	1	0	0	0	0	2	d	1	3	0	17.2	46.7	B	D	0.84	0.88	D	D
16	Arrow Hwy. (NS) / Dwy. 1 (EW)	-	DOES NOT EXIST												-	-	-	-	-	-	-	-
17	Arrow Hwy. (NS) / Dwy. 2 (EW)	-	DOES NOT EXIST												-	-	-	-	-	-	-	-

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width (23') for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; 1>> = Free Right Turn Lane; d = Defacto Right Turn Lane; 1 = Improvement

[2] Delay and level of service (LOS) calculated using the following analysis software: Synchro 8. Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown. "NA" value is shown for unsignalized ICU values.

[3] TS = Traffic Signal; CSS = Cross Street Stop.

[4] LOS based on average delay (unsignalized intersection).

[5] LOS based on minor approach operating condition (unsignalized intersection).

[6] The Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information.

* BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

Similar to Interim Year (2016) Without Project conditions, the ICU results for the intersection of Arrow Highway / Live Oak Avenue (#14) indicate that this intersection operates at LOS "E" during peak hours under Long Range (2035) Without Project conditions. However, the HCM results show that the intersection operates at acceptable LOS (LOS "D" or better). The HCM results present a more accurate representation of the intersection operational level.

5.1.5 Long Range (2035) With Project

HCM delay and ICU calculations for Long Range (2035) With Project Buildout conditions are shown in Table 5-7. The operation analysis worksheets are included in Appendix "N". Table 5-7 shows the operations analysis at the study area intersections with and without improvements. For Long Range (2035) With Project conditions, the following intersection is projected to operate at unacceptable level of service (in addition to the locations identified for Long Range (2035) Without Project conditions) during the peak hours, with existing geometry:

ID	Intersection Location	Jurisdiction
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	Caltrans

Similar to Interim Year (2016) With Project Conditions, the ICU results for the intersection of I-605 SB off-ramp / Arrow Highway (#3), I-605 SB On-Ramp / Live Oak Avenue (#7), and Arrow Highway / Live Oak Avenue (#14) operates at LOS "E" or worse during peak hours under Long Range (2035) With Project conditions. However, the HCM results show that the intersection operates at acceptable LOS (LOS "D" or better). The HCM results present a more accurate representation of the intersection operational level.

Table 5-8 summarizes the intersection analysis operations for Long Range (2035) Without Project and Long Range (2035) With Project Buildout conditions. Table 5-8 also identifies any "significant impacts" (as defined in the City of Irwindale traffic

TABLE 5-7

LONG RANGE (2035) WITH PROJECT CONDITIONS
INTERSECTIONS ANALYSIS SUMMARY

#	INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	T	R	SOUTH-BOUND L	T	R	EAST-BOUND L	T	R	WEST-BOUND L	T	R	HCM DELAY[2] (SECS.) AM	PM	HCM LEVEL OF SERVICE[2] AM	PM	ICU[6] (V/C) AM	PM	ICU[6] LEVEL OF SERVICE AM	PM
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	21.2	24.4	C	C	0.84	0.59	D	A
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	1	20.7	24.0	C	C	0.74	0.52	C	A
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)																					
	- Without Improvements	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	38.0	15.7	D	B	1.03	0.62	F	B
	- With Improvements	TS	0	0	0	2	0	1>>	0	3	0	0	2	0	10.8	9.2	B	A	0.69	0.44	B	A
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	11.0	11.0	B	B	NA	NA	NA	NA
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)	TS	1	2	0	0	2	1	2	0	1	0	0	0	7.9	8.9	A	A	0.70	0.45	B	A
6	Stewart Av. (NS) / Rivergrade Rd. (EW)	TS	1	1	0	0	1	0	1	2	0	1	2	0	5.7	6.9	A	A	0.15	0.15	A	A
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	35.6	21.3	D	C	0.96	0.98	E	E
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)																					
	Without Improvements[4]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	16.5	53.0	C	F	NA	NA	NA	NA
	-NB Slip Off-Ramp to Live Oak Av. Eastbound[5]	CSS	0	0	1	--	--	--	0	2	0	0	2	0	32.0	148.7	D	F	NA	NA	NA	NA
	-NB loop Off-Ramp to Live Oak Av. Westbound[5]	CSS	--	--	--	0	0	1	0	2	0	0	2	0	52.2	101.2	F	F	NA	NA	NA	NA
	With Improvements	TS	0	0	2	--	--	1	0	2	0	0	3	0	23.6	20.7	C	C	0.93	0.78	E	C
9	Graham Access Rd. (NS) / Live Oak Av. (EW)	TS	0	1	0	0	0	0	0	2	d	1	2	0	7.8	3.1	A	A	0.72	0.70	C	B
10	Live Oak Ln. (NS) / Live Oak Av. (EW)	CSS	0	0	0	0	1	0	1	2	0	0	2	d	15.4	11.8	C	B	NA	NA	NA	NA
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)	TS	1	2	0	1	2	1	1	2	1	1	2	d	35.0	30.4	D	C	0.83	0.83	D	D
12	Stewart Av. (NS) / Live Oak Av. (EW)	TS	0	1	0	1	1	1	1	2	d	1	2	d	11.5	21.1	B	C	0.68	0.87	B	D
13	Baldwin Park Bl. - Dwy. 3 (NS) / Live Oak Av. (EW)	TS	2	1	0	1	1	0	1	2	d	1	2	1	18.4	30.4	B	C	0.72	0.90	C	D
14	Arrow Hwy. (NS) / Live Oak Av. (EW)	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	9.6	33.2	A	C	0.63	0.95	B	E
15	Maine Av. (NS) / Arrow Hwy. (EW)	TS	2	0	1	0	0	0	0	2	d	1	3	0	17.4	48.5	B	D	0.84	0.89	D	D
16	Arrow Hwy. (NS) / Dwy. 1 (EW)	TS	1	2	0	0	2	1	1	0	1	0	0	0	12.9	11.0	B	B	0.77	0.51	C	A
17	Arrow Hwy. (NS) / Dwy. 2 (EW)	CSS	0	2	0	0	2	1	0	1	0	0	0	0	12.5	18.1	B	C	NA	NA	NA	NA

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width (23') for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; 1>> = Free Right Turn Lane; d = Defacto Right Turn Lane; 1 = Improvement

[2] Delay and level of service (LOS) calculated using the following analysis software: Synchro 8. Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown. "NA" value is shown for unsignalized ICU values.

[3] TS = Traffic Signal; CSS = Cross Street Stop.

[4] LOS based on average delay (unsignalized intersection).

[5] LOS based on minor approach operating condition (unsignalized intersection).

[6] The Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information.

* BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

TABLE 5-8

LONG RANGE (2035)

INTERSECTION ANALYSIS SUMMARY COMPARISON

#	INTERSECTION	TRAFFIC Control[3]	INTERSECTION APPROACH LANES[1]												HCM DELAY[2] (SECS.)		HCM LEVEL OF SERVICE[2]		ICU[8] (V/C)		ICU[8] LEVEL OF SERVICE		SIGNIFICANT IMPACT?[5]
			NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND											
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	AM	PM	AM	PM	
1	Live Oak Av. (West) (NS) / Arrow Hwy. (EW)																						
	• 2035 Without Project	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	21.2	24.4	C	C	0.84	0.58	D	A	
	• 2035 With Project	TS	2	0	1>>	0	0	0	0	2	2>>	2	2	0	21.2	24.4	C	C	0.84	0.59	D	A	NO
2	Avenida Barbosa St. (NS) / Arrow Hwy. (EW)																						
	• 2035 Without Project	TS	0	0	0	2	0	1	1	2	0	0	2	1	20.7	24.0	C	C	0.73	0.51	C	A	
	• 2035 With Project	TS	0	0	0	2	0	1	1	2	0	0	2	1	20.7	24.0	C	C	0.74	0.52	C	A	NO
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)																						
	• 2035 Without Project	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	18.0	10.0	B	A	0.90	0.51	D	A	
	• 2035 With Project	TS	0	0	0	1	0	1>>	0	3	0	0	2	0	--[4]	15.7	F	B	1.03	0.62	F	B	YES
	- With Improvements	TS	0	0	0	2	0	1>>	0	3	0	0	2	0	10.8	9.2	B	A	0.69	0.44	B	A	NO
4	I-605 NB On-Ramp/Live Oak Ln. (NS) / Arrow Hwy. (EW)																						
	• 2035 Without Project	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	10.8	10.6	B	B	NA	NA	NA	NA	
	• 2035 With Project	CSS	0	0	1	0	0	0	0	2	d	0	2	1>>	11.0	11.0	B	B	NA	NA	NA	NA	NO
5	Arrow Hwy. (NS) / Rivergrade Rd. (EW)																						
	• 2035 Without Project	TS	1	2	0	0	2	1	2	0	1	0	0	0	7.4	7.1	A	A	0.64	0.40	B	A	
	• 2035 With Project	TS	1	2	0	0	2	1	2	0	1	0	0	0	7.9	8.9	A	A	0.70	0.45	B	A	NO
6	Stewart Av. (NS) / Rivergrade Rd. (EW)																						
	• 2035 Without Project	TS	1	1	0	0	1	0	1	2	0	1	2	0	7.0	9.2	A	A	0.13	0.13	A	A	
	• 2035 With Project	TS	1	1	0	0	1	0	1	2	0	1	2	0	5.7	6.9	A	A	0.15	0.15	A	A	NO
7	I-605 SB On-Ramp (NS) / Live Oak Av. (EW)																						
	• 2035 Without Project	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	19.1	18.1	B	B	0.88	0.89	D	D	
	• 2035 With Project	TS	0	0	0	0	0	0	0	2	1>>	1	2	0	35.6	21.3	D	C	0.96	0.98	E	E	NO

TABLE 5-8
LONG RANGE (2035)
INTERSECTION ANALYSIS SUMMARY COMPARISON

#	INTERSECTION	TRAFFIC Control[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	T	R	SOUTH-BOUND L	T	R	EAST-BOUND L	T	R	WEST-BOUND L	T	R	HCM DELAY[2] (SECS.) AM	PM	HCM LEVEL OF SERVICE[2] AM	PM	ICU[8] (V/C) AM	PM	ICU[8] LEVEL OF SERVICE AM	PM	SIGNIFICANT IMPACT?[5]
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)																						
	• 2035 Without Project[6]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	14.2	32.9	B	D	NA	NA	NA	NA	
	• 2035 With Project[6]	CSS	0	0	1	0	0	1	0	2	0	0	2	0	16.5	53.0	C	F	NA	NA	NA	NA	YES
	- With Improvements	TS	0	0	2	--	--	1	0	2	0	0	3	0	23.6	20.7	C	C	0.93	0.78	E	C	NO
	-NB Slip Off-Ramp to Live Oak Av. Eastbound[7]																						
	• 2035 Without Project	CSS	0	0	1	--	--	--	0	2	0	0	2	0	19.9	82.2	C	F	NA	NA	NA	NA	
	• 2035 With Project	CSS	0	0	1	--	--	--	0	2	0	0	2	0	32.0	--[4]	D	F	NA	NA	NA	NA	YES
	-NB loop Off-Ramp to Live Oak Av. Westbound[7]																						
	• 2035 Without Project	CSS	--	--	--	0	0	1	0	2	0	0	2	0	53.8	81.6	F	F	NA	NA	NA	NA	
	• 2035 With Project	CSS	--	--	--	0	0	1	0	2	0	0	2	0	52.2	--[4]	F	F	NA	NA	NA	NA	YES
9	Graham Access Rd. (NS) / Live Oak Av. (EW)																						
	• 2035 Without Project	TS	0	1	0	0	0	0	0	2	d	1	2	0	7.2	2.8	A	A	0.68	0.65	B	B	
	• 2035 With Project	TS	0	1	0	0	0	0	0	2	d	1	2	0	7.8	3.1	A	A	0.72	0.70	C	B	NO
10	Live Oak Ln. (NS) / Live Oak Av. (EW)																						
	• 2035 Without Project	CSS	0	0	0	0	1	0	1	2	0	0	2	d	14.6	14.8	B	B	NA	NA	NA	NA	
	• 2035 With Project	CSS	0	0	0	0	1	0	1	2	0	0	2	d	15.4	11.8	C	B	NA	NA	NA	NA	NO
11	Rivergrade Rd. (NS) / Live Oak Av. (EW)																						
	• 2035 Without Project	TS	1	2	0	1	2	1	1	2	1	1	2	d	23.6	27.6	C	C	0.77	0.82	C	D	
	• 2035 With Project	TS	1	2	0	1	2	1	1	2	1	1	2	d	35.0	30.4	D	C	0.83	0.83	D	D	NO
12	Stewart Av. (NS) / Live Oak Av. (EW)																						
	• 2035 Without Project	TS	0	1	0	1	1	1	1	2	d	1	2	d	10.9	19.6	B	B	0.67	0.86	B	D	
	• 2035 With Project	TS	0	1	0	1	1	1	1	2	d	1	2	d	11.5	21.1	B	C	0.68	0.87	B	D	NO
13	Baldwin Park Bl. - Dwy. 3 (NS) / Live Oak Av. (EW)																						
	• 2035 Without Project	TS	2	0	1	0	0	0	0	2	d	1	2	0	12.7	21.2	B	C	0.63	0.85	B	D	
	• 2035 With Project	TS	2	1	0	1	1	0	1	2	d	1	2	1	18.4	30.4	B	C	0.72	0.90	C	D	NO

TABLE 5-8

LONG RANGE (2035)
INTERSECTION ANALYSIS SUMMARY COMPARISON

#	INTERSECTION	TRAFFIC Control[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	T	R	SOUTH-BOUND L	T	R	EAST-BOUND L	T	R	WEST-BOUND L	T	R	HCM DELAY[2] (SECS.) AM	PM	HCM LEVEL OF SERVICE[2] AM	PM	ICU[8] (V/C) AM	PM	ICU[8] LEVEL OF SERVICE AM	PM	SIGNIFICANT IMPACT?[5]
14	Arrow Hwy. (NS) / Live Oak Av. (EW)																						
	• 2035 Without Project	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	8.8	32.1	A	C	0.62	0.94	B	E	
	• 2035 With Project	TS	0	0	0	2	0	1	1	2	0	0	2	2>>	9.6	33.2	A	C	0.63	0.95	B	E	NO
15	Maine Av. (NS) / Arrow Hwy. (EW)																						
	• 2035 Without Project	TS	2	0	1	0	0	0	0	2	d	1	3	0	17.2	46.7	B	D	0.84	0.88	D	D	
	• 2035 With Project	TS	2	0	1	0	0	0	0	2	d	1	3	0	17.4	48.5	B	D	0.84	0.89	D	D	NO
16	Arrow Hwy. (NS) / Dwy. 1 (EW)																						
	• 2035 Without Project	-	DOES NOT EXIST												-	-	-	-	-	-	-	-	
	• 2035 With Project	TS	1	2	0	0	2	1	1	0	1	0	0	0	12.9	11.0	B	B	0.77	0.51	C	A	NO
17	Arrow Hwy. (NS) / Dwy. 2 (EW)																						
	• 2035 Without Project	-	DOES NOT EXIST												-	-	-	-	-	-	-	-	
	• 2035 With Project	CSS	0	2	0	0	2	1	0	1	0	0	0	0	12.5	18.1	B	C	NA	NA	NA	NA	NO

1 When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width (23') for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; 1>> = Free Right Turn Lane; d = Defacto Right Turn Lane; 1 = Improvement

2 Delay and level of service calculated using the following analysis software: Synchro 8. Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown. "NA" value is shown for unsignalized ICU values.

3 TS = Traffic Signal; CSS = Cross Street Stop.

4 -- = Delay High (>100.0 secs.) or V/C Ratio exceeding 1.0, Intersection Unstable, Level of Service "F".

5 Per City of Irwindale traffic study guidelines, a significant impact is identified if one of the following criterias are met:
- For Signalized Intersections
  - When an intersection operates at acceptable LOS ("D" or better) for baseline conditions and the addition of project results in unacceptable LOS ("E" or "F").
  - When a State Highway intersection operates at acceptable LOS ("E" or better) for baseline conditions and the addition of project results in unacceptable LOS "F".
  - When an intersection operates at LOS "F" for baseline conditions and the project adds more than 50 peak hour project trips .
- For Unsignalized Intersections
  - When the minor stop-contolled approach operates at LOS "F" and does not have acceptable LOS in terms of average delay, and the addition of project increases the total control delay to more than 4.0 hours for single lane approach and 5.0 hours for multilane approach.

6 LOS based on average delay (unsignalized intersection).

7 LOS based on minor approach operating condition (unsignalized intersection).

8 The Synchro v/c output results are discussed in the City of Irwindale Policy Guidelines for Traffic Impact Reports under Section B (page insert) and indicated that the v/c ratio results in the Synchro are based on ICU and should be presented in addition to delay information.

* BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

study guidelines). As shown on Table 5-8, significant impacts are projected for the following locations:

ID	Intersection Location	Jurisdiction
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	Caltrans
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

As shown in Table 5-6 and Table 5-7, the following improvements are necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's impact to *"less-than-significant":*

I-605 NB Off-Ramp (NS) / Live Oak Avenue (#8)

- Install a traffic signal.
- Construct a second northbound right turn lane.
- Provide a third westbound through lane by modifying the existing raised median.

I-605 SB Off-Ramp (NS) / Arrow Highway (EW) (#3)

- Construct a 2nd southbound left turn lane.

It should be noted that the recommended interchange improvements I-605 Freeway Northbound Off-Ramp at Live Oak Avenue and Southbound Off-Ramp at Arrow Highway are generally consistent with the *Traffic Study Report for I-605/Live Oak Avenue/Arrow Highway Interchanges (December 14, 2012)*, prepared by Advantec Consulting Engineers. Therefore, Caltrans approval can reasonably be expected.

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6.0 FREEWAY MAINLINE AND RAMP ANALYSIS

The freeway mainline and ramp merge / diverge analysis presented in this chapter of the report has been performed using the HCS computer program. Per Caltrans request, I-210 interchange at Irwindale Avenue is included in the analysis. The peak hour volumes at the I-605 Freeway were presented on Exhibits 2-H, 2-I, 3-C, 3-D, 4-B, 4-C, 4-F, 4-G, 4-I, 4-J, 4-L, 4-M, 4-O, 4-P, 4-R, and 4-S. I-210 freeway peak hour volumes are presented in Exhibit 6-A.

6.1 Existing Plus Project

The Existing Plus Project freeway mainline analysis results are presented on Table 6-1. As shown on Table 6-1, the study area freeway mainline segments are projected to operate at acceptable LOS with the existing 4-lanes in each direction during the AM peak hour and PM peak hours for Existing Plus Project conditions.

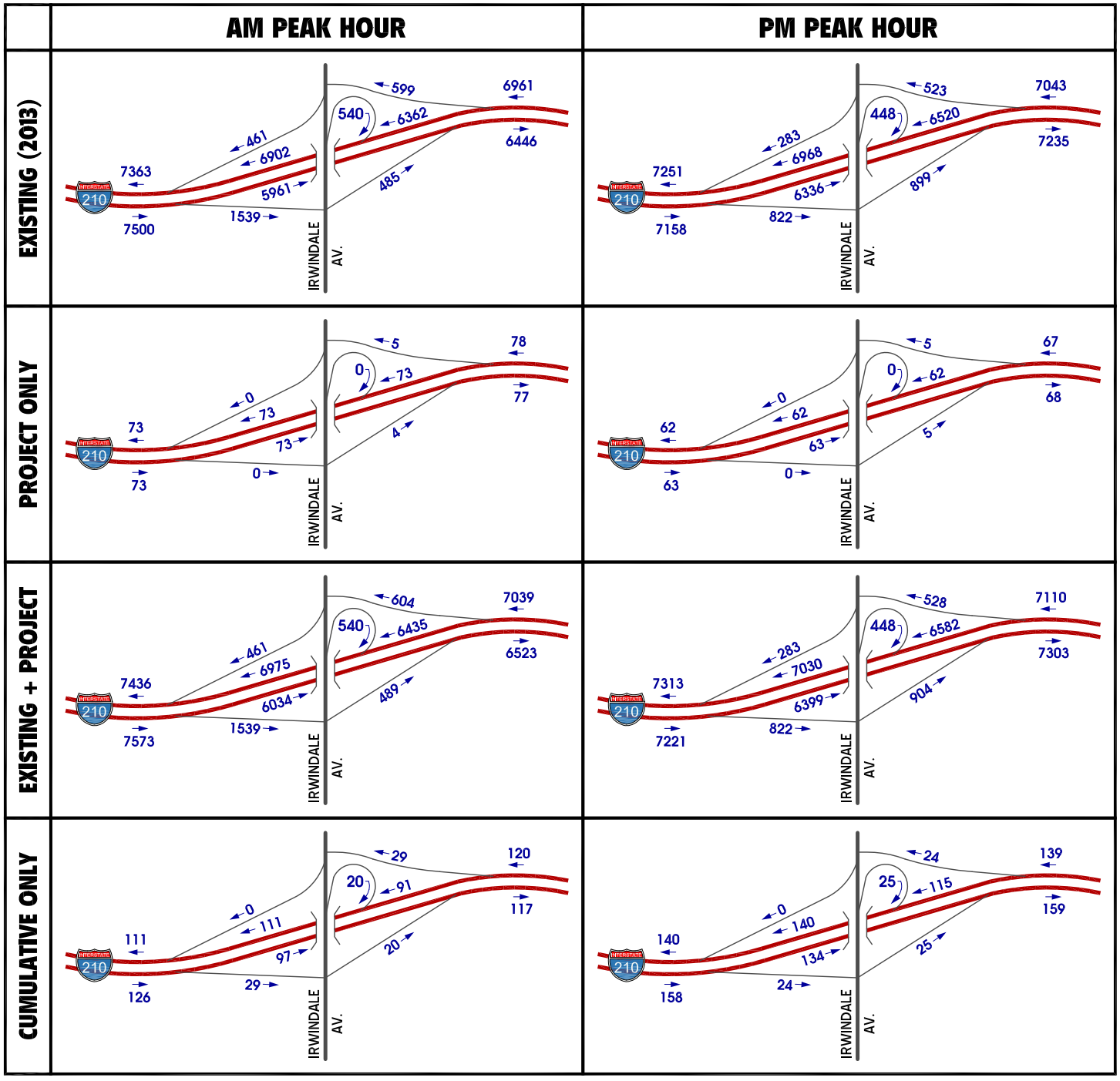
The Existing Plus Project freeway ramp analysis results are presented on Table 6-2. As shown on Table 6-2, the following study area freeway ramp location is anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)

The queuing analysis results are presented in Table 6-3. Vehicular queues appear to clear in a reasonable and timely fashion throughout the network under Existing plus Project traffic conditions, with the exception of the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue.

The freeway mainline, ramp, and queuing analysis calculation worksheets for Existing Plus Project conditions are included in Appendix "O".

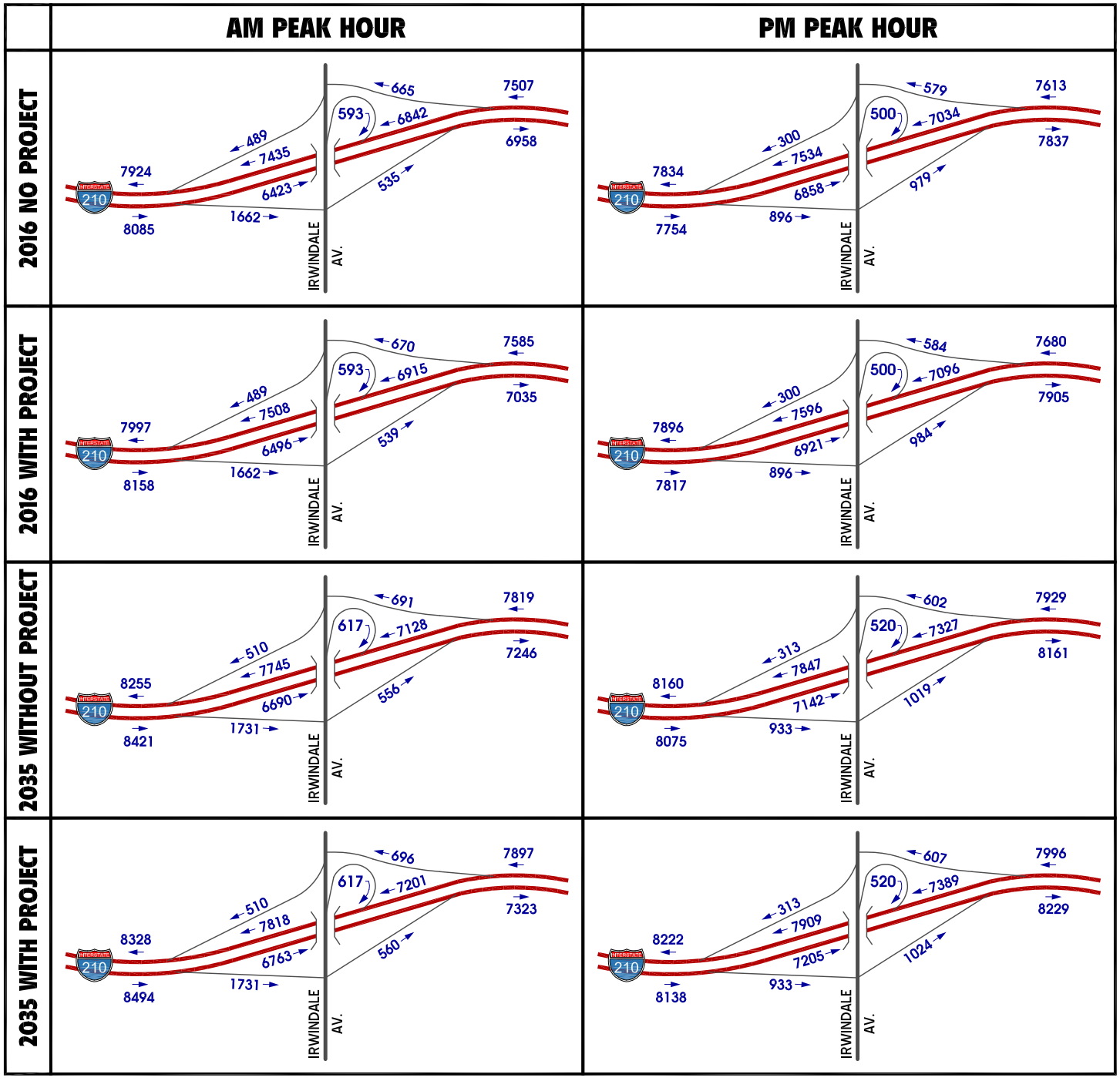
I-210 / IRWINDALE AVENUE INTERCHANGE
FREEWAY AND RAMP PEAK HOUR VOLUMES



NOTE: *AS MENTIONED IN SECTION 3.2 OF THIS TRAFFIC STUDY, FREEWAY MAINLINE VOLUMES ARE ACTUAL VEHICLES (AS OPPOSED TO PASSENGER-CAR-EQUIVALENT VOLUMES) AND A 7% TRUCK PERCENTAGE HAS BEEN UTILIZED IN THE BASIC FREEWAY SEGMENT ANALYSIS.*

N

I-210 / IRWINDALE AVENUE INTERCHANGE
FREEWAY AND RAMP PEAK HOUR VOLUMES



NOTE: *AS MENTIONED IN SECTION 3.2 OF THIS TRAFFIC STUDY, FREEWAY MAINLINE VOLUMES ARE ACTUAL VEHICLES (AS OPPOSED TO PASSENGER-CAR-EQUIVALENT VOLUMES) AND A 7% TRUCK PERCENTAGE HAS BEEN UTILIZED IN THE BASIC FREEWAY SEGMENT ANALYSIS.*

N

TABLE 6-1

EXISTING PLUS PROJECT CONDITIONS
BASIC FREEWAY SEGMENT ANALYSIS SUMMARY

FREEWAY	DIRECTION	MAINLINE SEGMENT LOCATION	Lanes[1]	VOLUME		DENSITY[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	Immediately South of Live Oak Avenue	4	6,254	6,131	25.8	20.7	C	C
		Between Live Oak Avenue and Eastbound Arrow Highway Loop On Ramp	4	4,919	4,751	19.8	25.1	C	C
		Between Eastbound Arrow Highway Loop On Ramp and Westbound Arrow Highway On Ramp	4	5,167	4,874	20.8	19.1	C	C
		Immediately North of Westbound Arrow Highway On Ramp	4	5,753	5,312	23.3	19.6	C	C
	SB	Immediately North of Arrow Highway Off Ramps	4	4,628	4,809	18.6	19.3	C	C
		Between Arrow Highway Off Ramps and Live Oak On Ramps	4	3,655	4,166	14.7	16.7	B	B
		Immediately South of Live Oak On Ramps	4	5,139	5,839	20.2	23.7	C	C
I-210 FREEWAY	WB	Immediately East of Irwindale Avenue Westbound Off Ramp	4	7,039	7,110	30.4	30.8	D	D
		Between Irwindale Avenue Westbound Loop On Ramp and Irwindale Avenue Westbound Off Ramp	4	6,435	6,582	26.7	27.5	D	D
		Immediately West of Irwindale Avenue Westbound On Ramp	4	7,436	7,313	33.2	32.3	D	D
	EB	Immediately West of Irwindale Avenue Eastbound Off Ramp	4	7,573	7,221	34.4	31.6	D	D
		Between Irwindale Avenue Eastbound Off Ramp and Irwindale Avenue Eastbound OnRamp	4	6,034	6,399	24.7	26.5	C	D
		Immediately East of Irwindale Avenue Eastbound Off Ramp	4	6,523	7,303	27.2	32.2	D	D

[1] Number of lanes is in the specified direction and is based on existing conditions.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+: Basic Freeway Segments software, Version 5.21

TABLE 6-2

EXISTING PLUS PROJECT CONDITIONS
FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS

FREEWAY	DIRECTION	RAMP LOCATION	Lanes on Freeway[1]	VOLUME		DENSITY [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	NB Off Ramp at Live Oak Avenue	4	1,335	1,380	35.3	35.0	E	D
		NB Loop On Ramp for Eastbound Arrow Highway	4	248	123	20.6	19.8	C	B
		NB Direct On Ramp for Westbound Arrow Highway	4	586	438	23.7	21.5	C	C
	SB	SB Off Ramp at Arrow Highway	4	973	643	26.8	25.9	C	C
		SB On Ramp at Live Oak Avenue	4	1,484	1,673	25.7	29.0	C	D
I-210 FREEWAY	WB	WB Off Ramp at Irwindale Avenue	4	604	528	33.5	33.4	D	D
		WB Loop On Ramp at Irwindale Avenue	4	540	448	29.2	29.0	D	D
		WB Direct On Ramp at Irwindale Avenue	4	461	283	29.2	28.2	D	D
	EB	EB Off Ramp at Irwindale Avenue	4	1,539	822	22.2	20.5	C	C
		EB On Ramp at Irwindale Avenue	4	489	904	26.9	29.5	C	D

[1] Existing conditions for all study area merge/diverge locations consists of single lane on/off ramps.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+ : Ramps and Ramp Junction software, Version 5.21

TABLE 6-3

EXISTING PLUS PROJECT CONDITIONS
INTERSECTION QUEUING ANALYSIS SUMMARY[1]

ID	Intersection	Turning Movement Lane	Existing Storage Length[2] (feet)	Minimum Recommended Storage Length[3] (feet)	95th Percentile Queue Length Per Lane (feet)		Acceptable?[4]	
					AM	PM	AM	PM
3	I-605 SB Off-Ramp (NS) /							
	Arrow Hwy. (EW)	SBL	980	-	404 [5]	278 [5]	YES	YES
		SBR	1,060	-	0	0	YES	YES
		EBT	1,300	-	46	89	YES	YES
		WBT	1,160	-	277	55	YES	YES
7	I-605 SB On-Ramp (NS) /							
	Live Oak Av. (EW)	EBT	1,200	-	71	275 [5]	YES	YES
		EBR	670	-	0	0	YES	YES
		WBL	350	625	611 [5]	423 [5]	NO	NO
		WBT	545	-	0	0	YES	YES
8	I-605 NB Off-Ramp (NS) /							
	Live Oak Av. (EW)							
	- EBR on Live Oak Av. [6]	NBR	835	-	459	459	YES	YES
	- WBR on Live Oak Av. [6]	SBR Loop	1,560	-	427	413	YES	YES
		EBT	545	-	0	0	YES	YES
	- NWT [6]	WBT	545	-	20	15	YES	YES

[1] Queue length calculated using Synchro 8 with SimTraffic.

[2] Existing pocket length storage (for turning movements) or link distance (for through movements).

[3] Minimum recommended storage length needed to accommodate the anticipated 95th percentile queues.

[4] Storage Length is acceptable if the required queuing length is less than or equal to the storage length provided.

[5] 95th percentile volume exceeds capacity, queue may be longer.

[6] Synchro worksheet lane group movement reference

6.2 Interim Year (2016) Without Project

The Interim Year (2016) Without Project freeway mainline analysis results are presented on Table 6-4. As shown on Table 6-4, the following study area freeway mainline segments are anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Mainline Segments
10	I-210 Westbound, Immediately West of Irwindale Avenue Westbound On-Ramp
11	I-210 Eastbound, Immediately West of Irwindale Avenue Eastbound Off-Ramp
13	I-210 Eastbound, Immediately East of Irwindale Avenue Eastbound Off-Ramp

The Interim Year (2016) Without Project freeway ramp analysis results are presented on Table 6-5. As shown on Table 6-5, the following study area freeway ramp locations are projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)
6	I-210 Westbound - Off-Ramp at Irwindale Avenue (Diverge)

The queuing analysis results are presented in Table 6-6. Vehicular queues appear to clear in a reasonable and timely fashion throughout the network under Interim Year (2016) Without Project traffic conditions, with the exception of the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue.

The freeway mainline, ramp, and queuing analysis calculation worksheets for Interim Year (2016) Without Project conditions are included in Appendix "P".

6.3 Interim Year (2016) With Project

The Interim Year (2016) With Project freeway mainline analysis results are presented on Table 6-7. As shown on Table 6-7, the following study area freeway mainline segments

TABLE 6-4

INTERIM YEAR (2016) WITHOUT PROJECT CONDITIONS
BASIC FREEWAY SEGMENT ANALYSIS SUMMARY

FREEWAY	DIRECTION	MAINLINE SEGMENT LOCATION	Lanes[1]	VOLUME		DENSITY[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	Immediately South of Live Oak Avenue	4	6,749	6,686	28.5	28.1	D	D
		Between Live Oak Avenue and Eastbound Arrow Highway Loop On Ramp	4	5,406	5,304	21.8	21.4	C	C
		Between Eastbound Arrow Highway Loop On Ramp and Westbound Arrow Highway On Ramp	4	5,669	5,437	22.9	21.9	C	C
		Immediately North of Westbound Arrow Highway On Ramp	4	6,168	5,799	25.3	23.5	C	C
	SB	Immediately North of Arrow Highway Off Ramps	4	5,014	5,238	20.2	21.1	C	C
		Between Arrow Highway Off Ramps and Live Oak On Ramps	4	4,102	4,660	16.5	18.7	B	C
		Immediately South of Live Oak On Ramps	4	5,606	6,362	22.7	26.3	C	D
I-210 FREEWAY	WB	Immediately East of Irwindale Avenue Westbound Off Ramp	4	7,507	7,613	33.8	34.7	D	D
		Between Irwindale Avenue Westbound Loop On Ramp and Irwindale Avenue Westbound Off Ramp	4	6,842	7,034	29.1	30.3	D	D
		Immediately West of Irwindale Avenue Westbound On Ramp	4	7,924	7,834	37.6	36.7	E	E
	EB	Immediately West of Irwindale Avenue Eastbound Off Ramp	4	8,085	7,754	39.3	36.0	E	E
		Between Irwindale Avenue Eastbound Off Ramp and Irwindale Avenue Eastbound OnRamp	4	6,423	6,858	26.6	29.2	D	D
		Immediately East of Irwindale Avenue Eastbound Off Ramp	4	6,958	7,837	29.8	36.7	D	E

[1] Number of lanes is in the specified direction and is based on existing conditions.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+: Basic Freeway Segments software, Version 5.21

TABLE 6-5

INTERIM YEAR (2016) WITHOUT PROJECT CONDITIONS
FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS

FREEWAY	DIRECTION	RAMP LOCATION	Lanes on Freeway[1]	VOLUME		DENSITY [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	NB Off Ramp at Live Oak Avenue	4	1,343	1,383	37.5	37.4	E	E
		NB Loop On Ramp for Eastbound Arrow Highway	4	263	133	22.4	21.8	C	C
		NB Direct On Ramp for Westbound Arrow Highway	4	499	362	24.8	22.9	C	C
	SB	SB Off Ramp at Arrow Highway	4	912	578	28.1	27.3	D	C
		SB On Ramp at Live Oak Avenue	4	1,504	1,702	27.5	31.0	C	D
I-210 FREEWAY	WB	WB Off Ramp at Irwindale Avenue	4	665	579	35.8	36.4	E	E
		WB Loop On Ramp at Irwindale Avenue	4	593	500	25.0	25.9	C	C
		WB Direct On Ramp at Irwindale Avenue	4	489	300	31.1	29.9	D	D
	EB	EB Off Ramp at Irwindale Avenue	4	1,662	896	24.4	21.1	C	C
		EB On Ramp at Irwindale Avenue	4	535	979	28.4	31.7	D	D

[1] Existing conditions for all study area merge/diverge locations consists of single lane on/off ramps.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+ : Ramps and Ramp Junction software, Version 5.21

TABLE 6-6

INTERIM YEAR (2016) WITHOUT PROJECT CONDITIONS
INTERSECTION QUEUING ANALYSIS SUMMARY[1]

ID	Intersection	Turning Movement Lane	Existing Storage Length[2] (feet)	Minimum Recommended Storage Length[3] (feet)	95th Percentile Queue Length Per Lane (feet)		Acceptable?[4]	
					AM	PM	AM	PM
3	I-605 SB Off-Ramp (NS) /							
	Arrow Hwy. (EW)	SBL	980	-	470 [5]	340 [5]	YES	YES
		SBR	1,060	-	0	0	YES	YES
		EBT	1,300	-	54	103	YES	YES
		WBT	1,160	-	324	68	YES	YES
7	I-605 SB On-Ramp (NS) /							
	Live Oak Av. (EW)	EBT	1,200	-	83	317 [5]	YES	YES
		EBR	670	-	0	0	YES	YES
		WBL	350	700	698 [5]	509 [5]	NO	NO
		WBT	545	-	0	0	YES	YES
8	I-605 NB Off-Ramp (NS) /							
	Live Oak Av. (EW)							
	- EBR on Live Oak Av. [6]	NBR	835	-	480	459	YES	YES
	- WBR on Live Oak Av. [6]	SBR Loop	1,560	-	374	374	YES	YES
		EBT	545	-	0	0	YES	YES
	- NWT [6]	WBT	545	-	26	15	YES	YES

[1] Queue length calculated using Synchro 8 with SimTraffic.

[2] Existing pocket length storage (for turning movements) or link distance (for through movements).

[3] Minimum recommended storage length needed to accommodate the anticipated 95th percentile queues.

[4] Storage Length is acceptable if the required queuing length is less than or equal to the storage length provided.

[5] 95th percentile volume exceeds capacity, queue may be longer.

[6] Synchro worksheet lane group movement reference

TABLE 6-7

INTERIM YEAR (2016) WITH PROJECT CONDITIONS
BASIC FREEWAY SEGMENT ANALYSIS SUMMARY

FREEWAY	DIRECTION	MAINLINE SEGMENT LOCATION	Lanes[1]	VOLUME		DENSITY[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	Immediately South of Live Oak Avenue	4	6,871	6,815	29.2	28.9	D	D
		Between Live Oak Avenue and Eastbound Arrow Highway Loop On Ramp	4	5,406	5,304	21.8	21.4	C	C
		Between Eastbound Arrow Highway Loop On Ramp and Westbound Arrow Highway On Ramp	4	5,669	5,437	22.9	21.9	C	C
		Immediately North of Westbound Arrow Highway On Ramp	4	6,318	5,940	26.1	24.2	D	C
	SB	Immediately North of Arrow Highway Off Ramps	4	5,171	5,380	20.8	21.7	C	C
		Between Arrow Highway Off Ramps and Live Oak On Ramps	4	4,102	4,660	16.5	18.7	B	C
		Immediately South of Live Oak On Ramps	4	5,720	6,482	23.5	27.0	C	D
I-210 FREEWAY	WB	Immediately East of Irwindale Avenue Westbound Off Ramp	4	7,585	7,680	36.8	35.3	E	E
		Between Irwindale Avenue Westbound Loop On Ramp and Irwindale Avenue Westbound Off Ramp	4	6,915	7,096	29.5	30.7	D	D
		Immediately West of Irwindale Avenue Westbound On Ramp	4	7,997	7,896	38.3	37.3	E	E
	EB	Immediately West of Irwindale Avenue Eastbound Off Ramp	4	8,158	7,817	40.1	36.6	E	E
		Between Irwindale Avenue Eastbound Off Ramp and Irwindale Avenue Eastbound OnRamp	4	6,496	6,921	27.1	29.6	D	D
		Immediately East of Irwindale Avenue Eastbound Off Ramp	4	7,035	7,905	30.3	37.4	D	E

[1] Number of lanes is in the specified direction and is based on existing conditions.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+: Basic Freeway Segments software, Version 5.21

are anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Mainline Segments
8	I-210 Westbound, Immediately east of Irwindale Avenue Westbound Off-Ramp
10	I-210 Westbound, Immediately West of Irwindale Avenue Westbound On-Ramp
11	I-210 Eastbound, Immediately West of Irwindale Avenue Eastbound Off-Ramp
13	I-210 Eastbound, Immediately East of Irwindale Avenue Eastbound Off-Ramp

The Interim Year (2016) With Project freeway ramp analysis results are presented on Table 6-8. As shown on Table 6-8, the following study area freeway ramp locations are projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)
6	I-210 Westbound - Off-Ramp at Irwindale Avenue (Diverge)

The queuing analysis results are presented in Table 6-9. Vehicular queues appear to clear in a reasonable and timely fashion throughout the network under Interim Year (2016) With Project traffic conditions, with the exception of the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue.

The freeway mainline, ramp, and queuing analysis calculation worksheets for Interim Year (2016) With Project conditions are included in Appendix "Q".

As the proposed project would contribute to the existing and forecasted deficient freeway segments, the project's contribution to these cumulative traffic impacts are considered cumulatively considerable.

Neither Caltrans nor the State has adopted a fee program that can ensure that locally-contributed impact fees will be tied to improvements to freeway mainlines, and only Caltrans has the jurisdiction over mainline improvements. Because Caltrans has exclusive control over state highway improvements, ensuring that fair share contributions to mainline improvements are actually part of a program tied to

TABLE 6-8

INTERIM YEAR (2016) WITH PROJECT CONDITIONS
FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS

FREEWAY	DIRECTION	RAMP LOCATION	Lanes on Freeway[1]	VOLUME		DENSITY [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	NB Off Ramp at Live Oak Avenue	4	1,465	1,512	38.6	38.6	E	E
		NB Loop On Ramp for Eastbound Arrow Highway	4	263	133	22.4	21.8	C	C
		NB Direct On Ramp for Westbound Arrow Highway	4	649	503	26.0	24.0	C	C
	SB	SB Off Ramp at Arrow Highway	4	1,069	720	29.6	28.7	D	D
		SB On Ramp at Live Oak Avenue	4	1,618	1,822	28.4	32.0	D	D
I-210 FREEWAY	WB	WB Off Ramp at Irwindale Avenue	4	670	584	36.2	36.1	E	E
		WB Loop On Ramp at Irwindale Avenue	4	593	500	25.6	26.5	C	C
		WB Direct On Ramp at Irwindale Avenue	4	489	300	31.3	30.1	D	D
	EB	EB Off Ramp at Irwindale Avenue	4	1,662	896	25.0	21.7	C	C
		EB On Ramp at Irwindale Avenue	4	539	984	28.7	32.0	D	D

[1] Existing conditions for all study area merge/diverge locations consists of single lane on/off ramps.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+ : Ramps and Ramp Junction software, Version 5.21

TABLE 6-9

INTERIM YEAR (2016) WITH PROJECT CONDITIONS
INTERSECTION QUEUING ANALYSIS SUMMARY[1]

ID	Intersection	Turning Movement Lane	Existing Storage Length[2] (feet)	Minimum Recommended Storage Length[3] (feet)	95th Percentile Queue Length Per Lane (feet)		Acceptable?[4]	
					AM	PM	AM	PM
3	I-605 SB Off-Ramp (NS) /							
	Arrow Hwy. (EW)	SBL	980	-	419	352 [5]	YES	YES
		SBR	1,060	-	0	0	YES	YES
		EBT	1,300	-	155	108	YES	YES
		WBT	1,160	-	170	70	YES	YES
7	I-605 SB On-Ramp (NS) /							
	Live Oak Av. (EW)	EBT	1,200	-	90	336 [5]	YES	YES
		EBR	670	-	0	0	YES	YES
		WBL	350	700	698 [5]	533 [5]	NO	NO
		WBT	545	-	0	0	YES	YES
8	I-605 NB Off-Ramp (NS) /							
	Live Oak Av. (EW)							
	- EBR on Live Oak Av. [6]	NBR	835	-	459	562	YES	YES
	- WBR on Live Oak Av. [6]	SBR Loop	1,560	-	417	485	YES	YES
		EBT	545	-	0	0	YES	YES
	- NWT [6]	WBT	545	-	12	43	YES	YES

[1] Queue length calculated using Synchro 8 with SimTraffic.

[2] Existing pocket length storage (for turning movements) or link distance (for through movements).

[3] Minimum recommended storage length needed to accommodate the anticipated 95th percentile queues.

[4] Storage Length is acceptable if the required queuing length is less than or equal to the storage length provided.

[5] 95th percentile volume exceeds capacity, queue may be longer.

[6] Synchro worksheet lane group movement reference

implementation of mitigation is within the jurisdiction of Caltrans. As such, the City of Irwindale may decide whether specific overriding economic, legal, social, technological, or other benefits of the project outweigh the unavoidable adverse cumulative traffic impacts associated with the project.

6.4 Long Range (2035) Without Project

The Long Range (2035) Without Project freeway mainline analysis results are presented on Table 6-10. As shown on Table 6-10, the following study area freeway mainline segments are anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Mainline Segments
8	I-210 Westbound, Immediately east of Irwindale Avenue Westbound Off-Ramp
10	I-210 Westbound, Immediately West of Irwindale Avenue Westbound On-Ramp
11	I-210 Eastbound, Immediately West of Irwindale Avenue Eastbound Off-Ramp
13	I-210 Eastbound, Immediately East of Irwindale Avenue Eastbound Off-Ramp

The Long Range (2035) Without Project freeway ramp analysis results are presented on Table 6-11. As shown on Table 6-11, the following study area freeway ramp locations are projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)
6	I-210 Westbound - Off-Ramp at Irwindale Avenue (Diverge)

The queuing analysis results are presented in Table 6-12. Vehicular queues appear to clear in a reasonable and timely fashion throughout the network under Long Range (2035) Without Project traffic conditions, with the exception of the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue.

The freeway mainline, ramp, and queuing analysis calculation worksheets for Long Range (2035) Without Project conditions are included in Appendix "R".

TABLE 6-10

LONG RANGE (2035) WITHOUT PROJECT CONDITIONS
BASIC FREEWAY SEGMENT ANALYSIS SUMMARY

FREEWAY	DIRECTION	MAINLINE SEGMENT LOCATION	Lanes[1]	VOLUME		DENSITY[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	Immediately South of Live Oak Avenue	4	7,024	6,955	30.2	29.8	D	D
		Between Live Oak Avenue and Eastbound Arrow Highway Loop On Ramp	4	5,626	5,517	22.8	22.3	C	C
		Between Eastbound Arrow Highway Loop On Ramp and Westbound Arrow Highway On Ramp	4	5,900	5,655	24.0	22.9	C	C
		Immediately North of Westbound Arrow Highway On Ramp	4	6,418	6,030	26.6	24.6	D	C
	SB	Immediately North of Arrow Highway Off Ramps	4	5,214	5,447	21.0	22.0	C	C
		Between Arrow Highway Off Ramps and Live Oak On Ramps	4	4,266	4,847	17.1	19.5	B	C
		Immediately South of Live Oak On Ramps	4	5,831	6,619	23.7	27.8	C	D
I-210 FREEWAY	WB	Immediately East of Irwindale Avenue Westbound Off Ramp	4	7,819	7,929	36.6	37.7	E	E
		Between Irwindale Avenue Westbound Loop On Ramp and Irwindale Avenue Westbound Off Ramp	4	7,128	7,327	31.0	32.4	D	D
		Immediately West of Irwindale Avenue Westbound On Ramp	4	8,255	8,160	41.3	40.2	E	E
	EB	Immediately West of Irwindale Avenue Eastbound Off Ramp	4	8,421	8,075	43.4	39.2	E	E
		Between Irwindale Avenue Eastbound Off Ramp and Irwindale Avenue Eastbound OnRamp	4	6,690	7,142	28.2	31.1	D	D
		Immediately East of Irwindale Avenue Eastbound Off Ramp	4	7,246	8,161	31.8	40.2	D	E

[1] Number of lanes is in the specified direction and is based on existing conditions.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+: Basic Freeway Segments software, Version 5.21

TABLE 6-11

LONG RANGE (2035) WITHOUT PROJECT CONDITIONS
FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS

FREEWAY	DIRECTION	RAMP LOCATION	Lanes on Freeway[1]	VOLUME		DENSITY [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	NB Off Ramp at Live Oak Avenue	4	1,398	1,439	38.9	38.8	E	E
		NB Loop On Ramp for Eastbound Arrow Highway	4	274	138	23.2	22.6	C	C
		NB Direct On Ramp for Westbound Arrow Highway	4	518	375	25.7	23.7	C	C
	SB	SB Off Ramp at Arrow Highway	4	948	600	29.2	28.3	D	D
		SB On Ramp at Live Oak Avenue	4	1,565	1,772	28.5	32.2	D	D
I-210 FREEWAY	WB	WB Off Ramp at Irwindale Avenue	4	691	602	37.3	37.3	E	E
		WB Loop On Ramp at Irwindale Avenue	4	617	520	27.7	28.7	C	D
		WB Direct On Ramp at Irwindale Avenue	4	510	313	30.2	29.9	D	D
	EB	EB Off Ramp at Irwindale Avenue	4	1,731	933	27.6	24.2	C	C
		EB On Ramp at Irwindale Avenue	4	556	1,019	29.5	33.0	D	D

[1] Existing conditions for all study area merge/diverge locations consists of single lane on/off ramps unless noted.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+ : Ramps and Ramp Junction software, Version 5.21

TABLE 6-12

LONG RANGE (2035) WITHOUT PROJECT CONDITIONS
INTERSECTION QUEUING ANALYSIS SUMMARY[1]

ID	Intersection	Turning Movement Lane	Existing Storage Length[2] (feet)	Minimum Recommended Storage Length[3] (feet)	95th Percentile Queue Length Per Lane (feet)		Acceptable?[4]	
					AM	PM	AM	PM
3	I-605 SB Off-Ramp (NS) /							
	Arrow Hwy. (EW)	SBL	980	-	334 [5]	197	YES	YES
		SBR	1,060	-	0	0	YES	YES
		EBT	1,300	-	55	106	YES	YES
		WBT	1,160	-	368 [5]	68	YES	YES
7	I-605 SB On-Ramp (NS) /							
	Live Oak Av. (EW)	EBT	1,200	-	85	422 [5]	YES	YES
		EBR	670	-	0	0	YES	YES
		WBL	350	650	631 [5]	335 [5]	NO	YES
		WBT	545	-	0	0	YES	YES
8	I-605 NB Off-Ramp (NS) /							
	Live Oak Av. (EW)							
	- EBR on Live Oak Av. [6]	NBR	835	-	513	459	YES	YES
	- WBR on Live Oak Av. [6]	SBR Loop	1,560	-	374	378	YES	YES
		EBT	545	-	0	0	YES	YES
	- NWT [6]	WBT	545	-	42	22	YES	YES

[1] Queue length calculated using Synchro 8 with SimTraffic.

[2] Existing pocket length storage (for turning movements) or link distance (for through movements).

[3] Minimum recommended storage length needed to accommodate the anticipated 95th percentile queues.

[4] Storage Length is acceptable if the required queuing length is less than or equal to the storage length provided.

[5] 95th percentile volume exceeds capacity, queue may be longer.

[6] Synchro worksheet lane group movement reference

6.5 Long Range (2035) With Project

The Long Range (2035) With Project freeway mainline analysis results are presented on Table 6-13. As shown on Table 6-13, the following study area freeway mainline segments are anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Mainline Segments
8	I-210 Westbound, Immediately east of Irwindale Avenue Westbound Off-Ramp
10	I-210 Westbound, Immediately West of Irwindale Avenue Westbound On-Ramp
11	I-210 Eastbound, Immediately West of Irwindale Avenue Eastbound Off-Ramp
13	I-210 Eastbound, Immediately East of Irwindale Avenue Eastbound Off-Ramp

The Long Range (2035) With Project freeway ramp analysis results are presented on Table 6-14. As shown on Table 6-14, the following study area freeway ramp locations are projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)
6	I-210 Westbound - Off-Ramp at Irwindale Avenue (Diverge)

The queuing analysis results are presented in Table 6-15. Vehicular queues appear to clear in a reasonable and timely fashion throughout the network under Long Range (2035) With Project traffic conditions, with the exception of the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue.

The freeway mainline, ramp, and queuing analysis calculation worksheets for Long Range (2035) With Project conditions are included in Appendix "S".

Table 6-16 summarizes the vehicular queues for Existing, Existing Plus Project, Interim Year Without Project, Interim Year With Project, Long Range (2035) Without Project, and Long Range (2035) With Project conditions.

TABLE 6-13

LONG RANGE (2035) WITH PROJECT CONDITIONS
BASIC FREEWAY SEGMENT ANALYSIS SUMMARY

FREEWAY	DIRECTION	MAINLINE SEGMENT LOCATION	Lanes[1]	VOLUME		DENSITY[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	Immediately South of Live Oak Avenue	4	7,146	7,084	31.1	30.6	D	D
		Between Live Oak Avenue and Eastbound Arrow Highway Loop On Ramp	4	5,626	5,517	22.8	22.3	C	C
		Between Eastbound Arrow Highway Loop On Ramp and Westbound Arrow Highway On Ramp	4	5,900	5,655	24.0	22.9	C	C
		Immediately North of Westbound Arrow Highway On Ramp	4	6,568	6,171	27.4	25.3	D	C
	SB	Immediately North of Arrow Highway Off Ramps	4	5,371	5,589	21.7	22.6	C	C
		Between Arrow Highway Off Ramps and Live Oak On Ramps	4	4,266	4,847	17.1	19.5	B	C
		Immediately South of Live Oak On Ramps	4	5,945	6,739	24.2	28.4	C	D
I-210 FREEWAY	WB	Immediately East of Irwindale Avenue Westbound Off Ramp	4	7,897	7,996	37.3	38.3	E	E
		Between Irwindale Avenue Westbound Loop On Ramp and Irwindale Avenue Westbound Off Ramp	4	7,201	7,389	31.5	32.9	D	D
		Immediately West of Irwindale Avenue Westbound On Ramp	4	8,328	8,222	42.2	40.9	E	E
	EB	Immediately West of Irwindale Avenue Eastbound Off Ramp	4	8,494	8,138	44.4	39.9	E	E
		Between Irwindale Avenue Eastbound Off Ramp and Irwindale Avenue Eastbound OnRamp	4	6,763	7,205	28.6	31.5	D	D
		Immediately East of Irwindale Avenue Eastbound Off Ramp	4	7,323	8,229	32.4	40.9	D	E

[1] Number of lanes is in the specified direction and is based on existing conditions.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+: Basic Freeway Segments software, Version 5.21

TABLE 6-14

LONG RANGE (2035) WITH PROJECT CONDITIONS
FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS

FREEWAY	DIRECTION	RAMP LOCATION	Lanes on Freeway[1]	VOLUME		DENSITY [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-605 FREEWAY	NB	NB Off Ramp at Live Oak Avenue	4	1,520	1,568	40.1	40.1	E	E
		NB Loop On Ramp for Eastbound Arrow Highway	4	274	138	23.2	22.6	C	C
		NB Direct On Ramp for Westbound Arrow Highway	4	668	516	26.9	24.9	C	C
	SB	SB Off Ramp at Arrow Highway	4	1,105	742	30.7	29.7	D	D
		SB On Ramp at Live Oak Avenue	4	1,679	1,892	29.4	33.2	D	D
I-210 FREEWAY	WB	WB Off Ramp at Irwindale Avenue	4	696	607	37.6	37.6	E	E
		WB Loop On Ramp at Irwindale Avenue	4	617	520	28.3	29.2	D	D
		WB Direct On Ramp at Irwindale Avenue	4	510	313	31.6	31.3	D	D
	EB	EB Off Ramp at Irwindale Avenue	4	1,731	933	28.3	24.8	D	C
		EB On Ramp at Irwindale Avenue	4	560	1,024	29.7	33.3	D	D

[1] Existing conditions for all study area merge/diverge locations consists of single lane on/off ramps.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS+ : Ramps and Ramp Junction software, Version 5.21

TABLE 6-15

LONG RANGE (2035) WITH PROJECT CONDITIONS
INTERSECTION QUEUING ANALYSIS SUMMARY[1]

ID	Intersection	Turning Movement Lane	Existing Storage Length[2] (feet)	Minimum Recommended Storage Length[3] (feet)	95th Percentile Queue Length Per Lane (feet)		Acceptable?[4]	
					AM	PM	AM	PM
3	I-605 SB Off-Ramp (NS) /							
	Arrow Hwy. (EW)	SBL	980	-	488 [5]	352 [5]	YES	YES
		SBR	1,060	-	0	0	YES	YES
		EBT	1,300	-	56	108	YES	YES
		WBT	1,160	-	405 [5]	70	YES	YES
7	I-605 SB On-Ramp (NS) /							
	Live Oak Av. (EW)	EBT	1,200	-	86	336 [5]	YES	YES
		EBR	670	-	0	0	YES	YES
		WBL	350	725	719 [5]	533 [5]	NO	NO
		WBT	545	-	0	0	YES	YES
8	I-605 NB Off-Ramp (NS) /							
	Live Oak Av. (EW)							
	- EBR on Live Oak Av. [6]	NBR	835	-	562	459	YES	YES
	- WBR on Live Oak Av. [6]	SBR Loop	1,560	-	485	454	YES	YES
		EBT	545	-	0	0	YES	YES
	- NWT [6]	WBT	545	-	43	23	YES	YES

[1] Queue length calculated using Synchro 8 with SimTraffic.

[2] Existing pocket length storage (for turning movements) or link distance (for through movements).

[3] Minimum recommended storage length needed to accommodate the anticipated 95th percentile queues.

[4] Storage Length is acceptable if the required queuing length is less than or equal to the storage length provided.

[5] 95th percentile volume exceeds capacity, queue may be longer.

[6] Synchro worksheet lane group movement reference

TABLE 6-16

INTERSECTION QUEUING ANALYSIS SUMMARY COMPARISON[1]
95TH PERCENTILE QUEUE LENGTH PER LANE (FEET)

ID	Intersection	Turning Movement Lane	Existing (2013)						Interim Year (2016)						Long Range (2035)					
			No Project Queue length per lane (ft)		With Project Queue length per lane (ft)		Delta[2] Queue length per lane (ft)		No Project Queue length per lane (ft)		With Project Queue length per lane (ft)		Delta[2] Queue length per lane (ft)		No Project Queue length per lane (ft)		With Project Queue length per lane (ft)		Delta[2] Queue length per lane (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
3	I-605 SB Off-Ramp (NS) /																			
	Arrow Hwy. (EW)	SBL	232	150	404	278	172	128	317	188	470	340	153	152	334	197	488	352	154	155
		SBR	0	0	0	0	-	-	0	0	0	0	-	-	0	0	0	0	-	-
		EBT	46	87	46	89	-	2	53	101	54	103	1	2	55	106	56	108	1	2
		WBT	273	54	277	55	4	1	318	65	324	68	6	3	368	68	405	70	37	2
7	I-605 SB On-Ramp (NS) /																			
	Live Oak Av. (EW)	EBT	70	274	71	275	1	1	82	315	83	317	1	2	85	422	86	336	1	(86) [3]
		EBR	0	0	0	0	-	-	0	0	0	0	-	-	0	0	0	0	-	-
		WBL	504	267	611	423	107	156	598	395	698	509	100	114	631	335	719	533	88	198
		WBT	0	0	0	0	-	-	0	0	0	0	-	-	0	0	0	0	-	-
8	I-605 NB Off-Ramp (NS) /																			
	Live Oak Av. (EW)																			
	- EBR on Live Oak Av. [6]	NBR	147	555	459	459	312	(96) [3]	499	459	480	459	(19) [3]	-	513	459	562	459	49	-
	- WBR on Live Oak Av. [6]	SBR Loop	456	448	427	413	(29) [3]	(35) [3]	374	396	374	374	-	(22) [3]	374	378	485	454	111	76
		EBT	0	0	0	0	-	-	0	0	0	0	-	-	0	0	0	0	-	-
	- NWT [6]	WBT	0	98	20	15	20	(83) [3]	46	45	26	15	(20) [3]	(30) [3]	42	22	43	23	1	1

[1] Queue length calculated using Synchro 8, traffic signal coordination software or SimTraffic for unsignalized intersections.

[2] Delta = With Project - No Project

[3] Synchro 8 software program calculates the 95th Percentile Queue based on the Average Queue plus a 1.65 standard deviation. The 95th Percentile Queue, which may not ever be observed, is based on statistical calculations and simulations. In some cases, the addition of Project traffic yields a reduction in queue length due to variations in arrival patterns distributed to other intersection movements.

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7.0 IMPROVEMENT AND PROJECT FAIR SHARE CONTRIBUTION

This section of the report summarizes the off-site improvements and fair share percentages required to meet level of service requirements at each of the analysis locations where improvements are required. Improvements which will eliminate all anticipated roadway operational deficiencies throughout the study area have been identified for Long Range (2035) With Project Buildout traffic conditions. The improvements were determined through the operations analysis sections of this traffic study. Per City of Irwindale guidelines, the project shall pay its fair share of improvements to eliminate any of the significant impacts identified in the analysis chapters of this report.

7.1 Off-Site Recommended Improvements

For Existing plus Project, Interim Year (2016) Without and With Project conditions, the following improvements are recommended:

I-605 NB Off-Ramp (NS) / Live Oak Avenue (EW) (#8)

- Install a traffic signal
- Construct a 2nd northbound right turn lane.
- Provide a 3rd westbound through lane by modifying the existing raised median. This will also provide additional queuing storage for the westbound left turn lane at the intersection of I-605 SB On-Ramp (NS) / Live Oak Avenue (EW).

In addition, the following improvements are recommended for 2035 with Project Conditions:

I-605 SB Off-Ramp (NS) / Arrow Highway (EW) (#3)

- Construct a 2nd southbound left turn lane.

It should be noted that the abovementioned improvements are generally consistent with the *Traffic Study Report for I-605/Live Oak Avenue/Arrow Highway Interchanges December 14, 2012)*, prepared by Advantec Consulting Engineers.

TABLE 7-1

2035 WITH PROJECT BUILDOUT
FAIR SHARE PERCENTAGES FOR OFF-SITE IMPROVEMENTS

ID	INTERSECTION	EXISTING TRAFFIC	2035 WITHOUT PROJECT	2035 WITH PROJECT TRAFFIC	2035 PROJECT TRAFFIC	TOTAL NEW TRAFFIC	PROJECT % OF NEW TRAFFIC
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)						
	• AM Peak Hour	2,511	2,908	3,084	176	573	31%
	• PM Peak Hour	1,621	1,968	2,136	168	515	**33%**
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)						
	• AM Peak Hour	3,013	3,510	3,753	243	740	33%
	• PM Peak Hour	3,077	3,584	3,839	255	762	**33%**

7.2 2035 With Project Fair Share Percentage

The project fair share contributions towards the required 2035 off-site intersection improvements for the project are presented on Table 8-1. The project fair share contribution towards the required 2035 improvements at each location is based on the project's percentage of new traffic for Long Range With Project (2035) conditions. As indicated in Table 7-1, the project is anticipated to contribute to approximately 33% of the total new traffic at the intersection of I-605 SB Off-Ramp / Arrow Highway and I-605 NB Off-Ramp / Live Oak Avenue.

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8.0 FINDINGS AND RECOMMENDATIONS

This chapter of the report summarizes the overall findings and provides recommendations regarding project related traffic improvements.

8.1 Findings

8.1.1 Existing Conditions

Regional access to the site is provided by a number of major freeways, including Interstate Freeway 10 (I-10) to the south, I-605 Freeway to the west and I-210 Freeway to the north. However, based on discussion with the project team, project related truck traffic will be accessing the freeway system via the I-605 Freeway On and Off Ramps. Local access to the project site is anticipated to be provided by the following roadways:

- Rivergrade Road
- Stewart Avenue
- Baldwin Park Boulevard
- Arrow Highway
- Live Oak Avenue

For Existing (2013) conditions, the following intersection currently operates at unacceptable level of service (LOS "E" or worse) during the peak hours:

ID	Intersection Location	Jurisdiction
8	I-605 NB Off-Ramp (NS) / Live Oak Av. (EW)	Caltrans

Evaluation of the Freeway Mainline Segment and Merge/Diverge Ramp Junction Analysis indicate that study area mainline segments and ramp locations operate at acceptable level of service (LOS "D" or better) during the peak hours under all traffic conditions, without and with the addition of project traffic.

Queuing analysis results indicate that the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue currently exceeds the available storage length.

8.1.2 Project Development

The project will be constructed in one phase and expected to become operational in 2016. The project is expected to process approximately 6,000 tons of material per day with up to 345 employees.

Tables 2-1 (previously presented) and 2-2 present the project's trip generation. The proposed project is anticipated to generate approximately 8,333 passenger car equivalent (PCE) trip-ends per day with 664 AM peak hour trips and 664 PM peak hour trips.

8.1.3 Future Traffic Conditions

For Existing (2013) Plus Project, Interim Year (2016) Without and With Project, and Long Range (2035) Without Project conditions, no new intersections are projected to operate at unacceptable level of service in addition to the previously identified location under existing (2013) conditions.

For Long Range (2035) With Project conditions, the following intersection is projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry, in addition to the previously identified location under Existing (2013) conditions:

ID	Intersection Location	Jurisdiction
3	I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)	Caltrans

Freeway Mainline Segment Analysis results indicate study area mainline segment locations operate at acceptable level of service (LOS "D" or better) during the peak hours under Existing plus Project Conditions. However, for Interim Year (2016) Without Project Conditions, the following study area freeway

mainline segments are anticipated to operate at deficient level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Mainline Segments
10	I-210 Westbound, Immediately West of Irwindale Avenue Westbound On-Ramp
11	I-210 Eastbound, Immediately West of Irwindale Avenue Eastbound Off-Ramp
13	I-210 Eastbound, Immediately East of Irwindale Avenue Eastbound Off-Ramp

For Interim Year (2016) With Project Conditions and Long Range (2035) Without and With Project conditions, the following freeway mainline segment location is projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Mainline Segments
8	I-210 Westbound, Immediately east of Irwindale Avenue Westbound Off-Ramp

Merge/Diverge Ramp Junction Analysis results indicate the following freeway ramp location is projected to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-605 Northbound - Off-Ramp at Live Oak Avenue (Diverge)

For Interim Year (2016) Without and With Project Conditions and Long Range (2035) Without and With Project conditions, the following study area freeway ramp location is anticipated to operate at unacceptable level of service (LOS "E" or worse) during the peak hours, with existing geometry, in addition to the previously identified location under Existing plus Project Conditions:

ID	Freeway Merge/Diverge Ramp Junctions
6	I-210 Westbound - Off-Ramp at Irwindale Avenue (Diverge)

Queuing analysis results indicate that the westbound left turn lane movement at the intersection of I-605 SB On-Ramp / Live Oak Avenue is anticipated to continue to exceed the available storage length under future traffic conditions.

As the proposed project would contribute to the existing and forecasted deficient freeway segments, the project's contribution to these cumulative traffic impacts are considered cumulatively considerable.

Neither Caltrans nor the State has adopted a fee program that can ensure that locally-contributed impact fees will be tied to improvements to freeway mainlines, and only Caltrans has the jurisdiction over mainline improvements. Because Caltrans has exclusive control over state highway improvements, ensuring that fair share contributions to mainline improvements are actually part of a program tied to implementation of mitigation is within the jurisdiction of Caltrans. As such, the City of Irwindale may decide whether specific overriding economic, legal, social, technological, or other benefits of the project outweigh the unavoidable adverse cumulative traffic impacts associated with the project alternative.

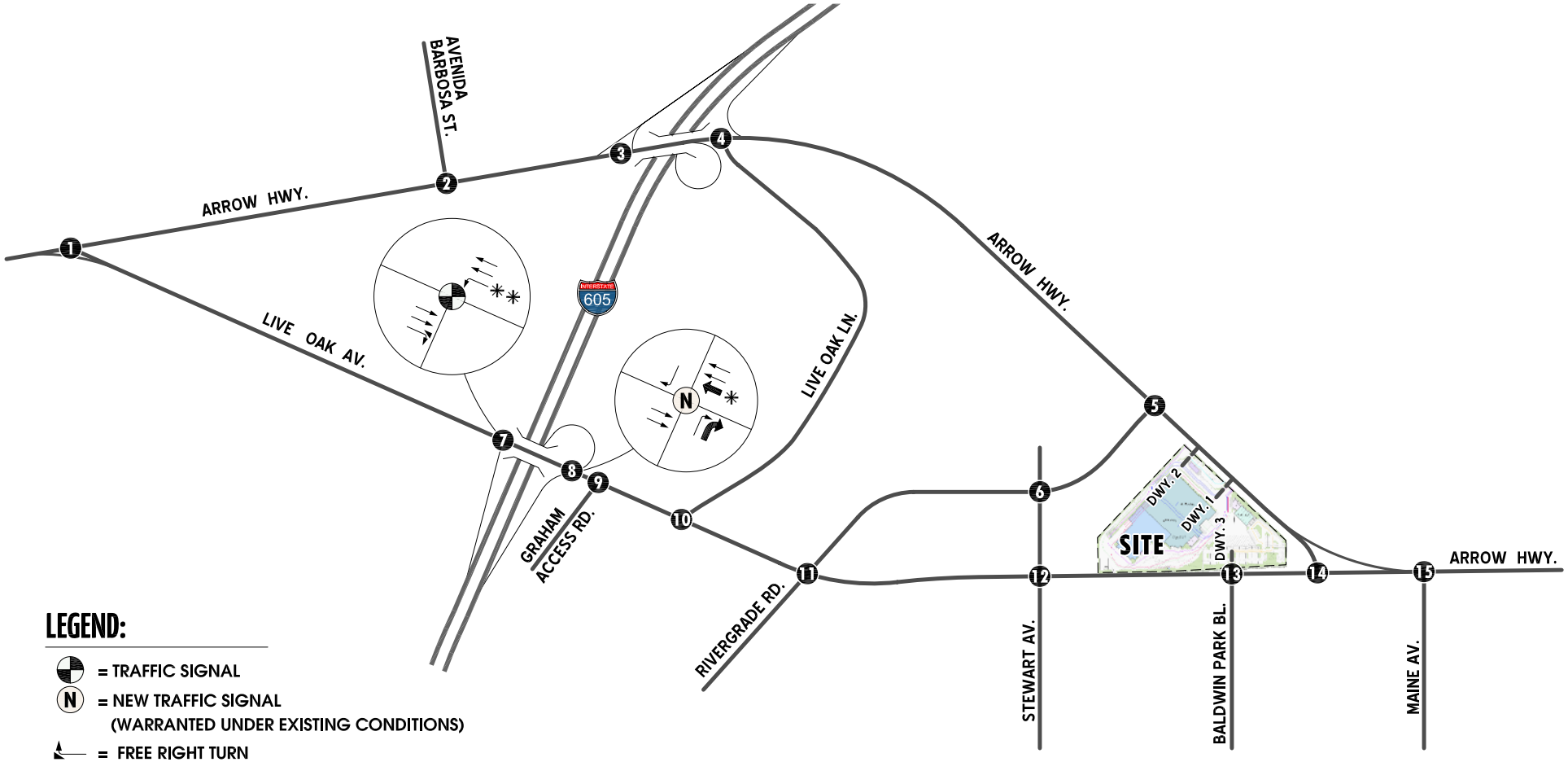
8.2 Project Recommendations

Recommended off-site and on-site improvements are presented on Exhibit's 8-A through 8-D. Exhibit 8-A illustrates the Interim Year (2016) With Project off-site improvements. Exhibit 8-B includes the conceptual striping plan for the off-site improvements identified in Exhibit 8-A. Exhibit 8-C presents the Long Range (2035) With Project off-site improvements. Exhibit 8-D presents the on-site improvements related to the project access intersections. As shown on Exhibit 8-D, the recommended on-site improvements are as follows:

Arrow Highway (NS) / Driveway 1 (EW) (#16) – Install a traffic signal and construct the intersection with the following geometrics:
Northbound Approach: One left turn lane (two way turn lane) and two through lanes.
Southbound Approach: Two through lanes and one right turn lane.
Eastbound Approach: One left turn lane and one right turn lane
Westbound Approach: N/A

EXHIBIT 8-A

INTERIM YEAR (2016) WITH PROJECT CONDITIONS REQUIRED OFF-SITE IMPROVEMENTS



LEGEND:

- = TRAFFIC SIGNAL
- (N) = NEW TRAFFIC SIGNAL (WARRANTED UNDER EXISTING CONDITIONS)
- = FREE RIGHT TURN
- = EXISTING LANE
- = LANE IMPROVEMENTS
- ✳✳ EXTEND LEFT TURN LANE STORAGE LENGTH BY MODIFYING THE EXISTING RAISED MEDIAN
- ✳ LANE INTENDED FOR DOWNSTREAM LEFT TURN LANE

N

EXHIBIT 8-B

CONCEPTUAL STRIPING PLAN FOR I-605 / LIVE OAK AVENUE INTERCHANGE RECOMMENDED IMPROVEMENTS

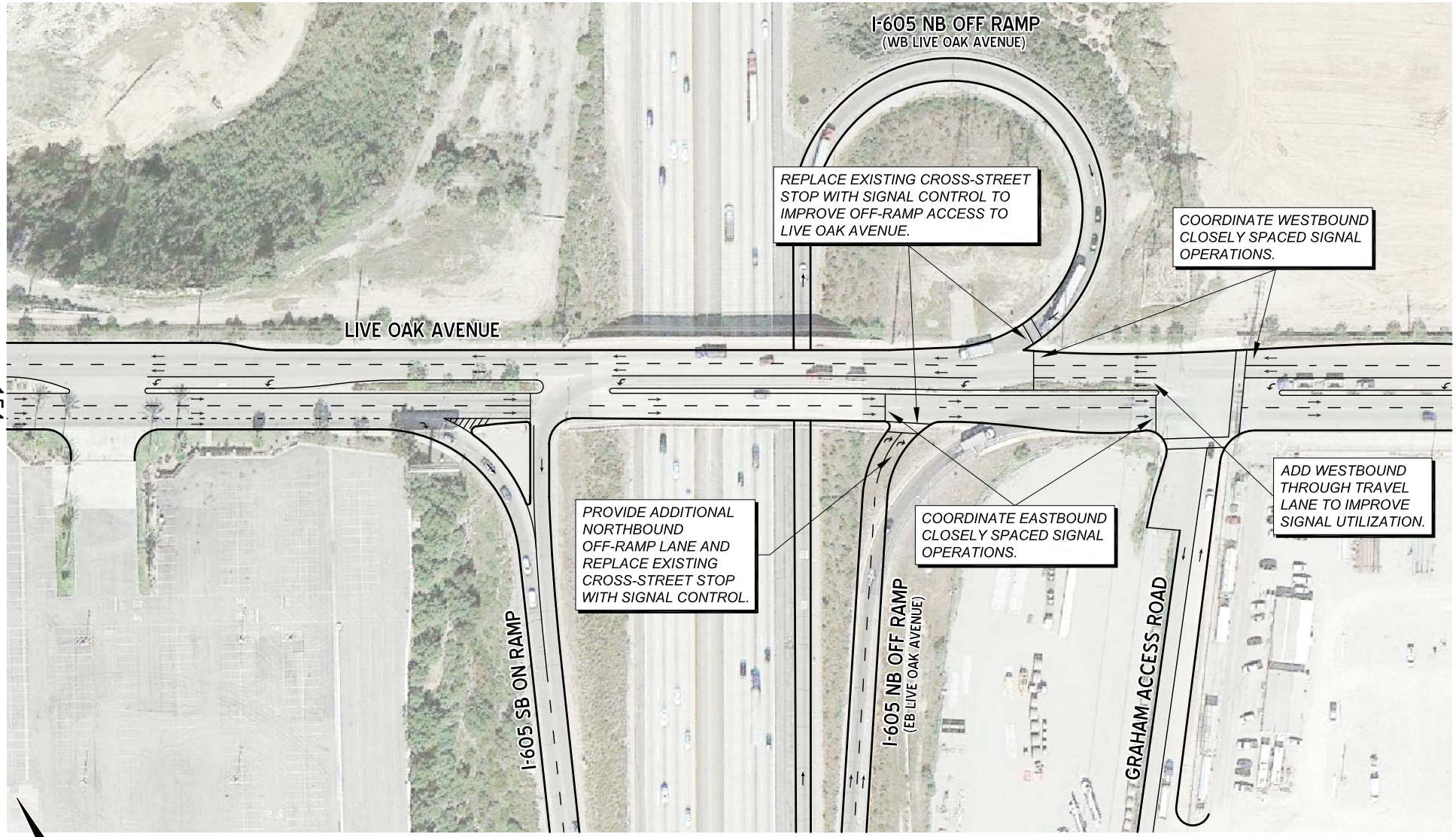


EXHIBIT 8-C

LONG RANGE HORIZON YEAR (2035) WITH PROJECT CONDITIONS REQUIRED OFF-SITE IMPROVEMENTS

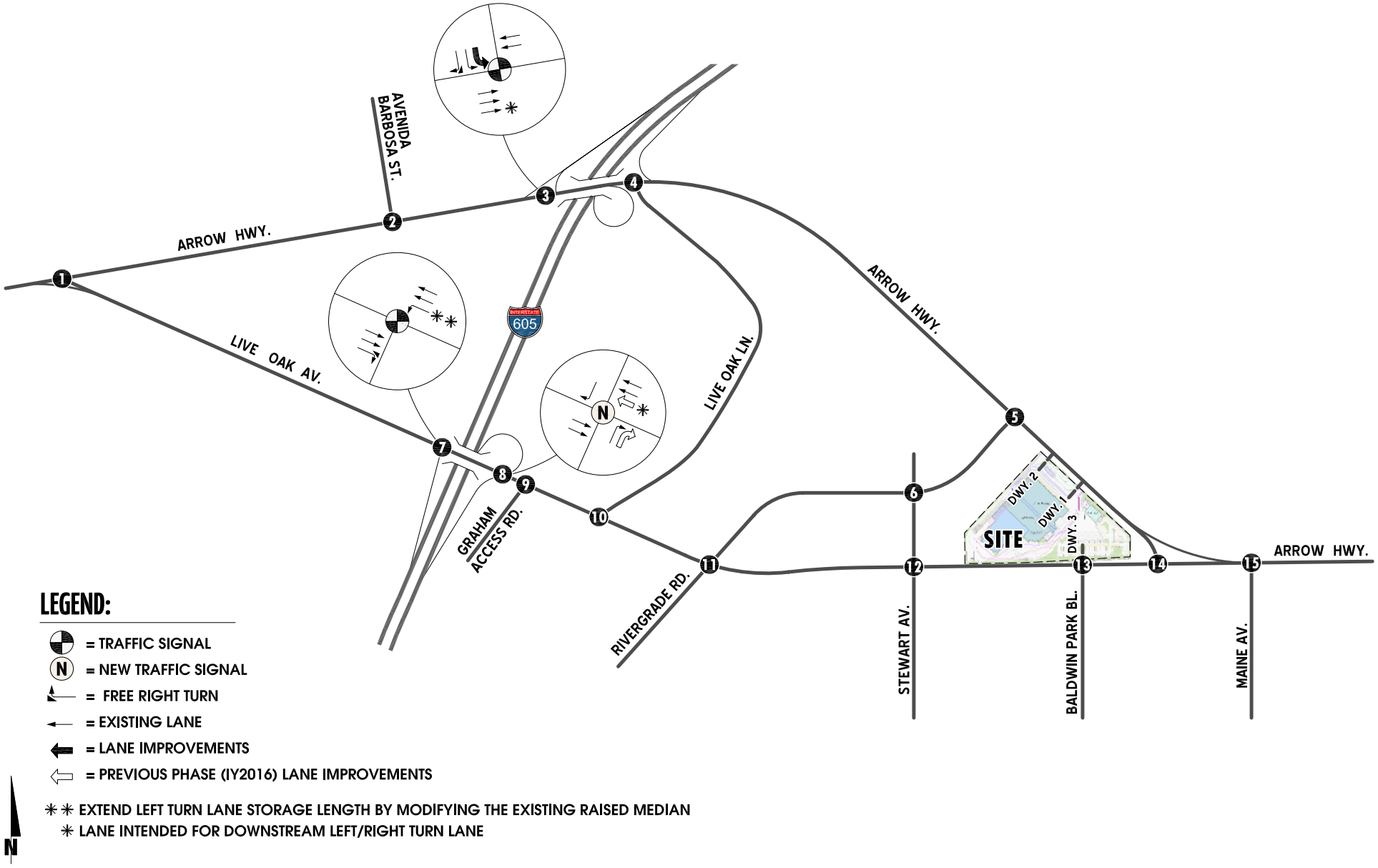
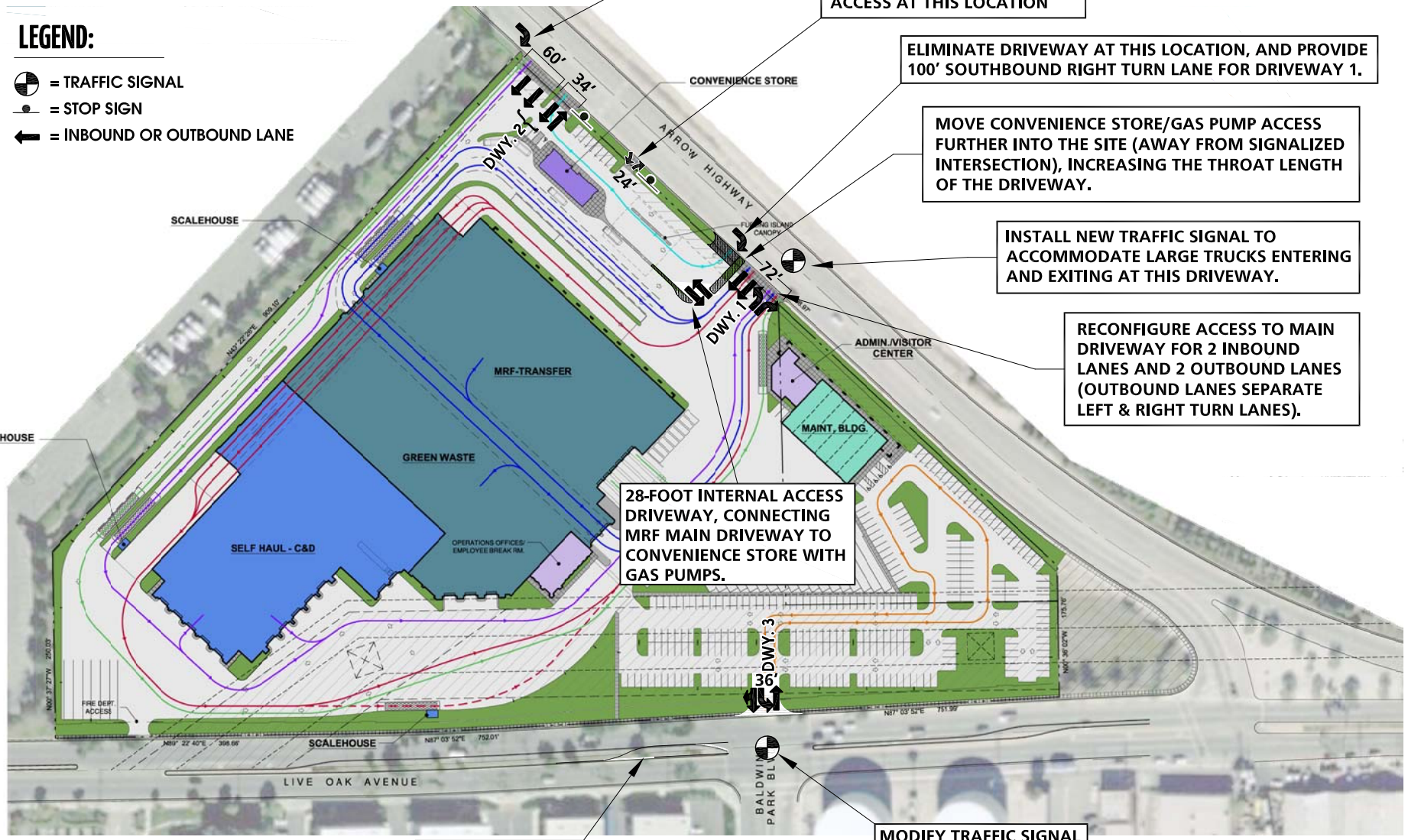


EXHIBIT 8-D

SITE ACCESS RECOMMENDATIONS



Arrow Highway (NS) / Driveway 2 (EW) (#17) – Install a stop control on the eastbound approach and construct the intersection with the following geometrics:
Northbound Approach: One left turn lane (two way turn lane) and two through lanes.
Southbound Approach: Two through lanes and one right turn lane.
Eastbound Approach: One shared left turn and right turn lane.
Westbound Approach: N/A

Driveway 3 - Baldwin Park Boulevard (NS) / Live Oak Av. (EW) (#13) – Modify traffic signal to include Project Driveway 3 (north leg) and construct the intersection with the following geometrics:
Northbound Approach: Two left turn lanes and one shared through-right turn lane.
Southbound Approach: One left turn lane and one shared through-right turn lane.
Eastbound Approach: One left turn lane (100-foot pocket length), two through lanes, and one defacto right turn lane.
Westbound Approach: One left turn lane, two through lanes, and one right turn lane.

Vehicle queuing on-site at the Arrow Highway / Driveway 1 intersection is estimated to require approximately 240 feet of back-up / storage length during peak hours. The Project site plan accommodates this on-site peak hour queuing activity. Inbound Project traffic does not cross the paths of outbound vehicles in the vicinity of Driveway 1. However, the site access recommendation shown on Exhibit 8-D include changes to the convenience store/gas pump access configuration in order to reduce conflicting auto turning movements in the vicinity of Driveway 1. Those recommendations include the following:

- Provide a right-in/right-out access for the convenience store located between Driveway 1 and Driveway 2 along Arrow Highway.
- Eliminate convenience store Driveway located immediately to the north of Driveway 1 along Arrow Highway.
- Move Convenience Store/Gas pump access further into the site (away from signalized intersection, increasing the throat length of the driveway).

- Provide a 28-foot internal access driveway connecting MRF main driveway to convenience store with gas pumps.
- On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project site.
- Sight distance at the project driveways should be reviewed with respect to standard Caltrans and City of Irwindale sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

8.3 Project Variant

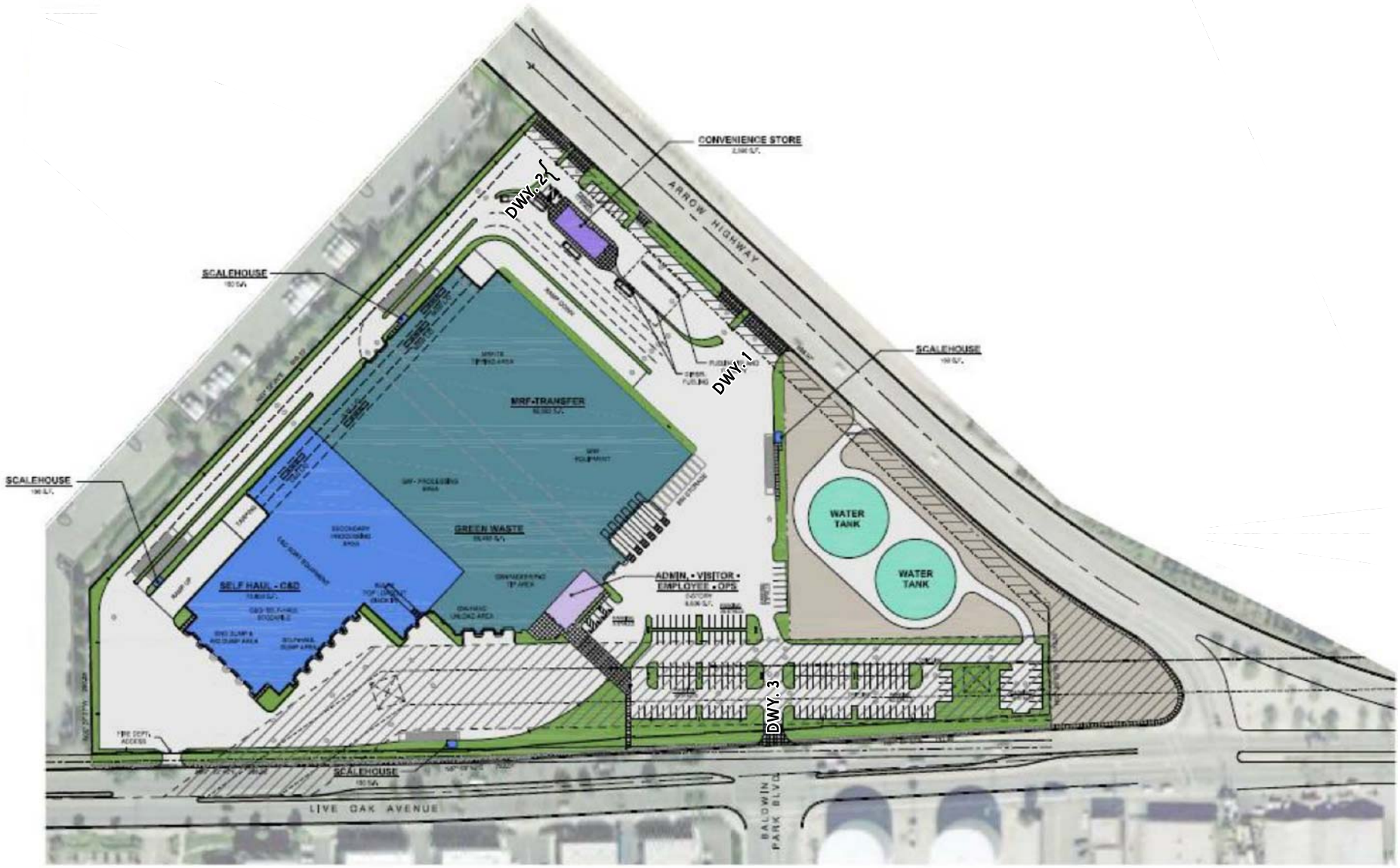
On the far eastern corner of the site, the Valley County Water District (VCWD) has expressed interest in acquiring 1.9 acres for placement of two water storage tanks (See Exhibit 8-E). This section of the project site, owned by the City of Irwindale, is referred to as the "project variant." In the event that VCWD does acquire the 1.9 acres, the project site would not be able to accommodate the required overnight parking for transfer trucks or the administrative office/maintenance building. In that event, the Applicant would need to hire sub-hauler vendors for all transfer truck operations, and the office/visitors' center would be incorporated into the main MRF/TS building.

Under this alternative development option, the MRF/TS facility would essentially be the same as the proposed project, except that due to the reduced acreage available, there would be no transfer trucks parked or maintained at the facility. In the absence of on-site parking and maintenance facilities for Applicant-owned transfer trucks, all transfer truck operations would be supplied via various sub-hauler vendors and similar contract arrangements.

Recommended off-site and on-site improvements previously presented on Exhibit's 8-A through 8-D would apply to the project variant. Exhibit 8-A illustrates the Interim Year (2016) With Project off-site improvements. Exhibit 8-B includes the conceptual striping plan for the off-site improvements identified in Exhibit 8-A. Exhibit 8-C presents the Long Range (2035) With Project off-site improvements. Exhibit 8-D presents the on-site improvements related to the project access intersections.

EXHIBIT 8-E

SITE PLAN PROJECT VARIANT



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APPENDIX A

SCOPING LETTER

URBAN CROSSROADS

41 Corporate Park | Suite 300 | Irvine, CA 92606 | (949) 660-1994
www.urbanXroads.com

Memorandum

DATE: Revised May 6, 2013

TO: Jeff Harvey, William Tam

FROM: John Kain, AICP; Marlie Whiteman, PE

RE: SCOPING OF ATHENS SERVICES MATERIALS RECOVERY FACILITY AND TRANSFER STATION TIA (2013), AND SITE PLAN REVIEW

Review of Previous TIA Submittal

On March 6, 2013 a conference call was held between City of Irwindale, Urban Crossroads, and Harvey-Meyerhoff staff to discuss the project and the July 2012 Transportation Analysis for the Athens Services Materials Recovery Facility and Transfer Station prepared by Gibson Transportation Consulting, Inc. Conference call participants included William Tam, Jeff Harvey, Elizabeth Meyerhoff, and Carleton Waters (UC). Among the items discussed:

- Peak of generator is much lower than data used in the 2009 UC traffic study prepared for a previous land use plan at this site. William Tam requested that we verify the information provided by Athens or use other objective data sources.
- Annual growth rate difference (0.46% per year in the July 2012 TIA compared with 2% per year in guidelines).
- Mitigation / Improvements were discussed with respect to fair share funding or condition to construct.
- William Tam indicated that City has been actively pursuing improvements at the freeway interchanges.
- Elizabeth Meyerhoff indicated that the project includes a General Plan Amendment, so long range analysis will be necessary.
- July 2012 TIA had added some intersections to the east as a result of adding the Vincent at Arrow Hwy location for truck parking. However, this site is no longer part of the project proposal. Original study area will generally be used.
- Jeff Harvey mentioned the need for a qualitative analysis of an alternative which has water tanks occupying 2.5 acres on the eastern end of the project site. This would be a “project variance scenario.”
- Jeff Harvey noted that the updated site plan will be needed from the applicant before final scoping of the environmental analysis.

Project Trip Generation

The project site plan for the Athens Services Materials Recovery Facility and Transfer Station is shown on Exhibit 1. Project buildout is anticipated to occur in 2016.

Project trip generation rates have been developed from empirical data collected by Urban Crossroads Inc. at various locations in southern California. The data is contained in Attachment 1. Attachment 1 also includes calculations performed by Urban Crossroads, Inc. staff to evaluate trip generation patterns and develop trip generation rates for each truck type. The empirical data includes truck axle counts for facilities of various sizes, so the weighted average trip rate was calculated. Because no indication was given regarding tons per day (TPD) by truck type, the rate is dependent on total TPD for the site.

Trip generation rates proposed for use in the project analysis are shown on Table 1. Trip rates were developed for truck trips (by number of axles) and employees, in addition to the convenience store with gas pumps. These rates have been used to calculate project trip generation (see Table 2).

Study Area

The proposed study area is shown on Exhibit 2. The proposed intersection analysis locations are listed on Table 3. Seventeen intersections are recommended for analysis, including the two site driveways to Arrow Highway. The third site driveway will also be analyzed as the north leg of the intersection of Baldwin Park Boulevard at Live Oak Avenue.

Project Trip Distribution

Project trip distribution patterns have been developed for each truck type, along with employee trip distribution and convenience store / gas trip distribution. Exhibits 3 and 4 show inbound and outbound trip distribution patterns for Self Haul / Contractor trucks, respectively. These 2-axle trucks will use Driveway 1 to enter the site and Driveway 2 to exit the site.

Trip distribution patterns for Collection trucks (including Packer, End Dump and Roll-off trucks) are shown on Exhibits 5 (inbound) and 6 (outbound). They will enter and exit the site through Driveway 1.

Transfer truck inbound and outbound trip distributions are shown on Exhibits 7 and 8, respectively. Transfer trucks will use Driveway 1 to enter and exit the site. Recyclable Loadout trucks comprise a portion of Transfer trucks, but have their own trip distribution patterns at the driveways. These recyclable loadout (4-axle) trucks enter the site through Driveway 1 and exit through Driveway 2.

Employee (passenger car) trip distribution patterns are shown on Exhibits 9 (inbound) and 10 (outbound). Employee vehicles use Driveway 3 (the north leg of the intersection of Baldwin Park Boulevard at Arrow Highway).

Inbound and outbound trip distributions for the convenience store with gas pumps are shown on Exhibits 11 and 12, respectively.

Access Evaluation / Site Plan Inputs

Access to the project site has been reviewed, and initial site access recommendations have been developed. Exhibit 13 shows the preliminary site access recommendations:

- For Driveway 1, install new traffic signal to accommodate large trucks entering and exiting at this driveway. Configure access to main driveway for 2 inbound lanes and 2 outbound lanes. The outbound lanes are 1 left and 1 right turn lane. Eliminate the small driveway immediately adjacent to Driveway 1.
- Construct 28' internal access driveway connecting the MRF main driveway (Driveway 1) to the convenience store with gas pumps.
- West of Driveway 1, provide right turn in/out only access with a stop sign for the outbound lane.
- Driveway 2 should provide two lanes inbound for trucks to access the MRF facility, and also 1 inbound and 1 outbound lane for the convenience store with gas pumps.
- Modify the traffic signal at the existing intersection of Baldwin Park Boulevard and Live Oak Avenue to accommodate Driveway 3 as the north leg of the intersection.
- Widen Driveway 3 to accommodate two outbound lanes (one through-right turn lane, and one left turn lane), as well as one inbound lane.
- Provide 100 foot eastbound left turn lane on the west leg of the Baldwin Park Boulevard and Live Oak Avenue intersection.

Existing Conditions Data

Existing lanes throughout the study area have been reviewed. The characteristics of the site's surrounding roadway network has been examined to verify the existing number of lanes, traffic signal locations, intersection configurations, and other visible factors which may have to be analyzed. Exhibit 14 documents the existing (2013) number of through lanes and intersection controls.

Existing AM and PM peak hour traffic volumes are taken from the 2012 study, and have been summarized on Exhibits 15 and 16, respectively. Urban Crossroads, Inc. proposes to collect Existing Daily Traffic Volumes (up to six new traffic counts). If necessary, these 2013 counts will be used to adjust the 2011 peak hour counts from the Gibson traffic study.

Proposed Analysis Scenarios

An evaluation of existing conditions (using the data described above) will be performed. A comparison will be conducted of the "Existing Conditions" against an "Existing Conditions plus Proposed Project". The purpose of this analysis is to provide a baseline for assessing traffic impacts of the project buildout in comparison to the existing conditions.

For interim (opening) year conditions, the proposed project will be evaluated as compared to without project conditions. The projected opening year is 2016. Ambient growth will be calculated using 2% per year, as indicated in the City of Irwindale Traffic Impact Analysis Policy Guidelines.

Long range horizon year analysis without and with the project is proposed as well. Ambient growth will consider both ambient growth assumptions and CMP criteria.

Analysis Criteria

Highway Capacity Manual (HCM) analysis will be performed for study area intersections. For signalized intersections, average total delay per vehicle for the overall intersection is used to determine level of service. Levels of service at the study intersections will be evaluated using an HCM intersection analysis program. The level of service will be determined at signalized intersections using data collected describing the intersection configuration, traffic signal timing, and traffic volumes to calculate average intersection delay.

The study area intersections which are stop sign controlled with stop-control on the minor street only will be analyzed using the two-way stop-controlled unsignalized intersection analysis methodology of the HCM. For these intersections, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the major street. The level of service criteria for this type of intersection analysis is based on total delay per vehicle for the worst minor street movement(s).

A saturation flow rate of 1,900 vehicles per hour of green (vphg) per lane will be utilized in each scenario. The signalized study area intersections will also be analyzed using the Intersection Capacity Utilization (ICU) technique. To calculate an ICU, the volume of traffic using the intersection is compared with the capacity of the intersection. ICU is usually expressed as a volume to capacity (V/C) ratio. The V/C represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. For unsignalized study area intersections, explicit ICU volume to capacity ratios cannot be calculated.

Urban segments (i.e., segments on roadways that are generally signalized) do not typically require segment analysis. Segment requirements can normally be determined by the analysis of lane requirements at intersections.

Definition of Deficiency

The City of Irwindale requires the following LOS criteria be implemented:

- LOS will not exceed LOS “D” at all intersections (excluding State Highway facilities) on arterial and collector streets.
- For State Highway facilities, the threshold is LOS “E”, consistent with the criteria used by the Los Angeles Congestion Management Program (CMP) for freeway mainline sections and freeway ramps.

Definition of Significant Impact

- When a signalized intersection operates at mid-range LOS “D” (45.0 seconds) or better under existing or future baseline conditions, and the

addition of project trips degrades the intersection operations to LOS “E” or “F”. The project mitigation should bring the facility to operate at mid-range LOS “D” at minimum.

- When a signalized intersection operates at mid-range LOS “E” (67.5 seconds) for State Highways or better under existing or future baseline conditions, and the addition of project trips degrades the intersection operations to 67.6 seconds (LOS “E”) or worse (LOS “F”). The project mitigation should bring the facility to operate at mid-range LOS “E” at minimum.

- When a signalized intersection operates at LOS “E” for non-state or LOS “F” (for State) under existing or future baseline conditions, and the addition of more than 50 peak hour project trips contributes to the continuing operational failure at the intersection. The project mitigation should bring the facility to pre-project conditions.

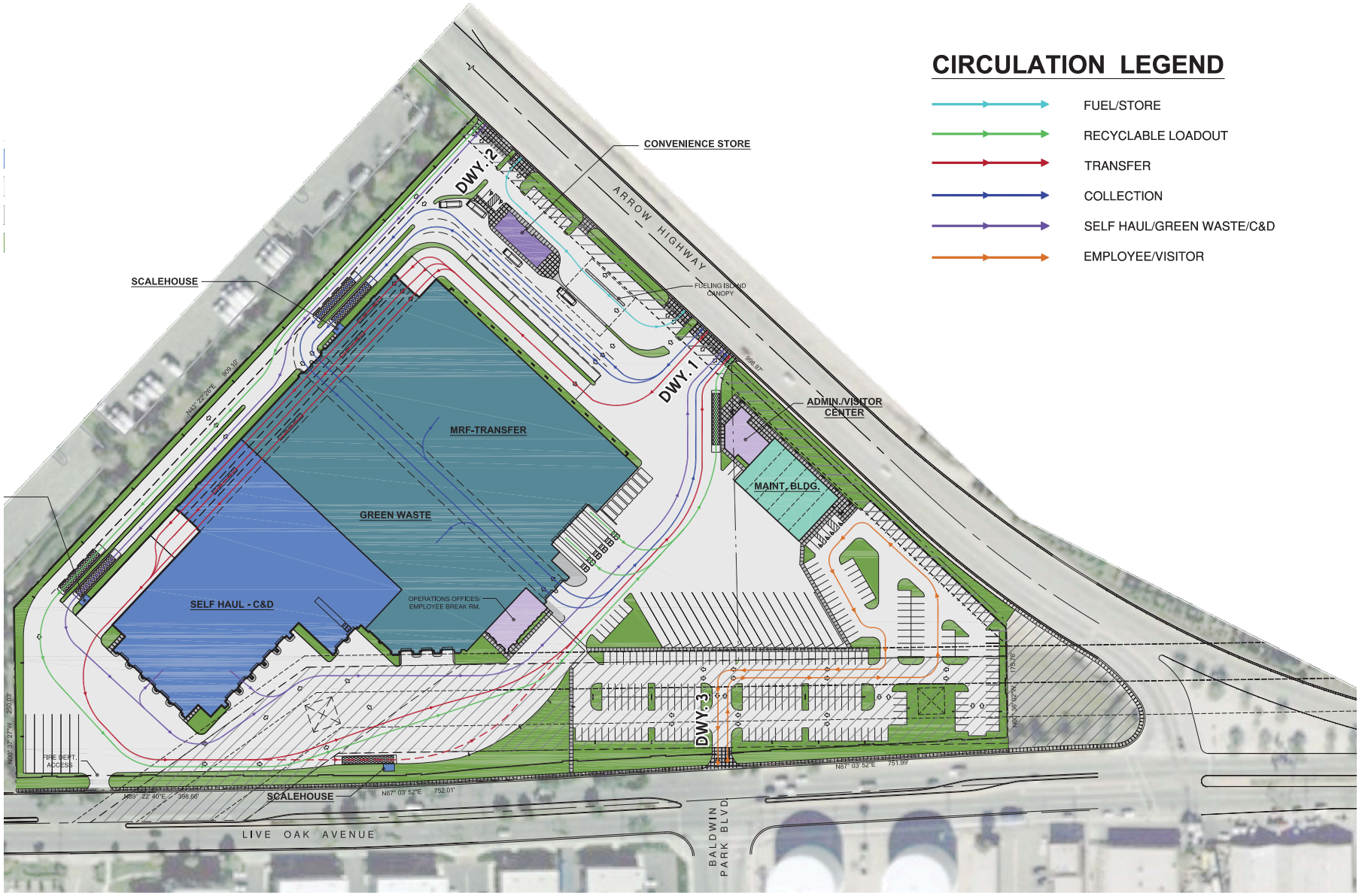
- At an unsignalized intersection, when the minor stop-controlled approach operates at LOS **“F”** and does not have acceptable operation in terms of total control delay, and the addition of project trips increases the total control delay to more than 4.0 vehicle hours for a single lane approach or 5.0 vehicle hours for a multi-lane approach. The project mitigation should bring the facility to operate at LOS “E” (at a minimum) or bring the total control delay to less than 4.0 vehicle-hours for a single lane approach or 5.0 vehicle-hours for a multi-lane approach (at a minimum).

- At an unsignalized intersection, when the minor stop controlled approach operates at LOS **“F”** and does not have an acceptable operation in terms of total control delay, and the addition of more than 50 peak hour project trips contributes to the continuing operational failure at the minor approach. The project mitigation should bring the facility to pre-project conditions.

For freeway analysis, the CMP requires analysis where the project will add 150 or more trips in either direction, during the AM or PM weekday peak hours. Based upon the trip generation calculations and trip distribution patterns identified in this scoping letter, analysis of freeway ramp merge / diverge and mainline performance may not be necessary.

EXHIBIT 1

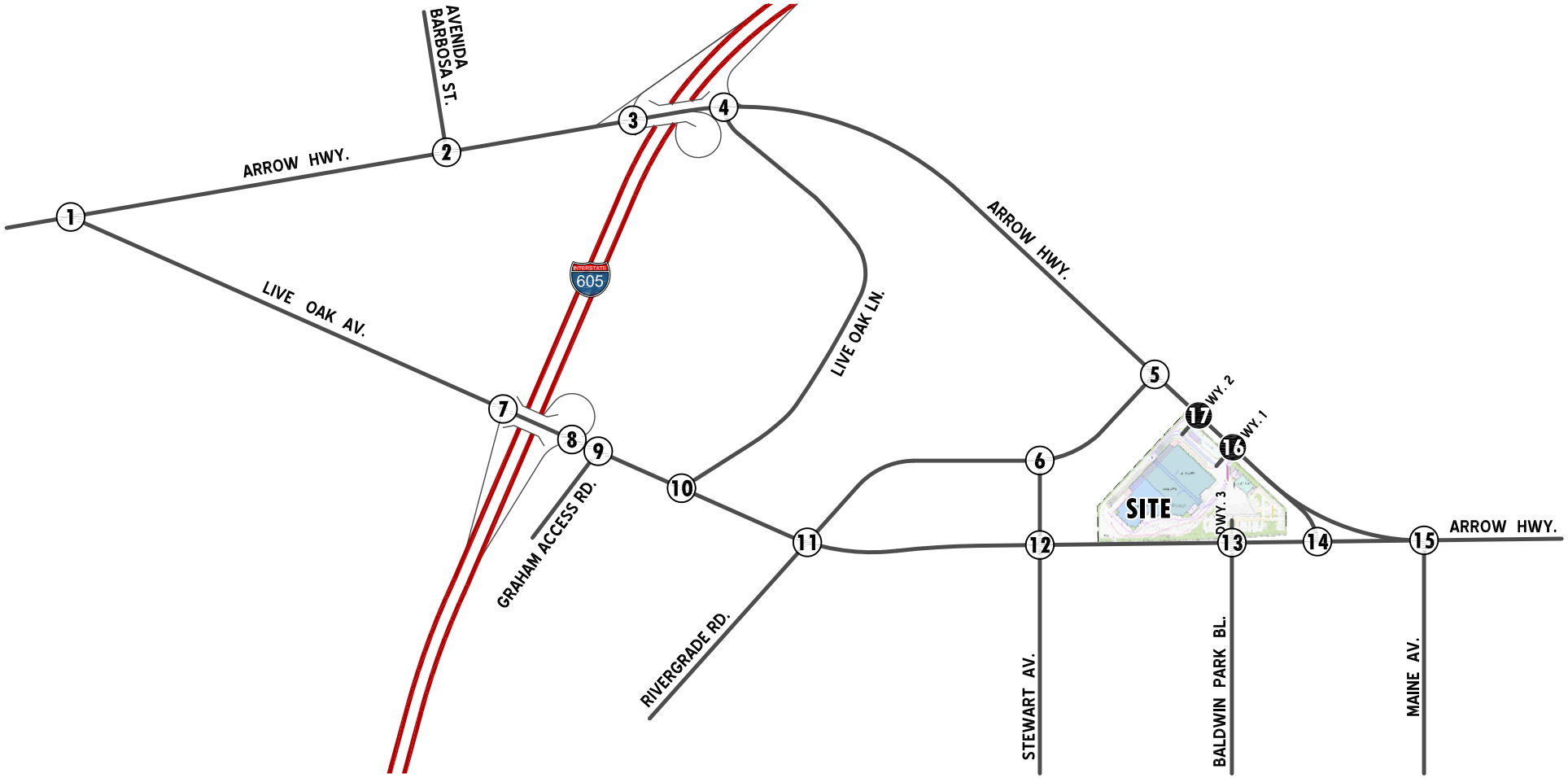
SITE PLAN



A-6

EXHIBIT 2

LOCATION MAP



A-7

LEGEND:

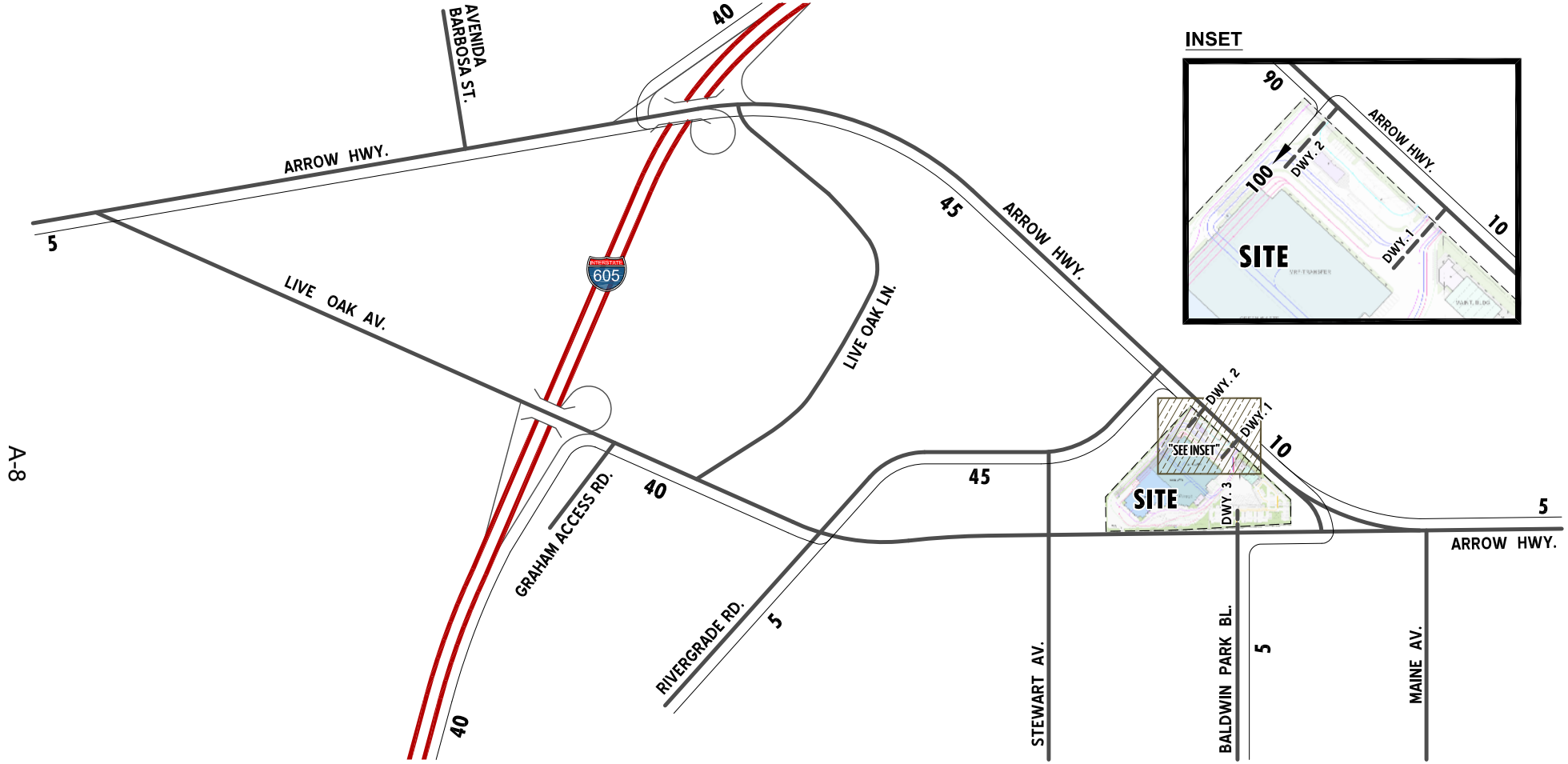
15 = EXISTING INTERSECTION ANALYSIS LOCATION

2 = FUTURE INTERSECTION ANALYSIS LOCATION

N

EXHIBIT 3

SELF HAUL/CONTRACTOR TRUCK INBOUND TRIP DISTRIBUTION



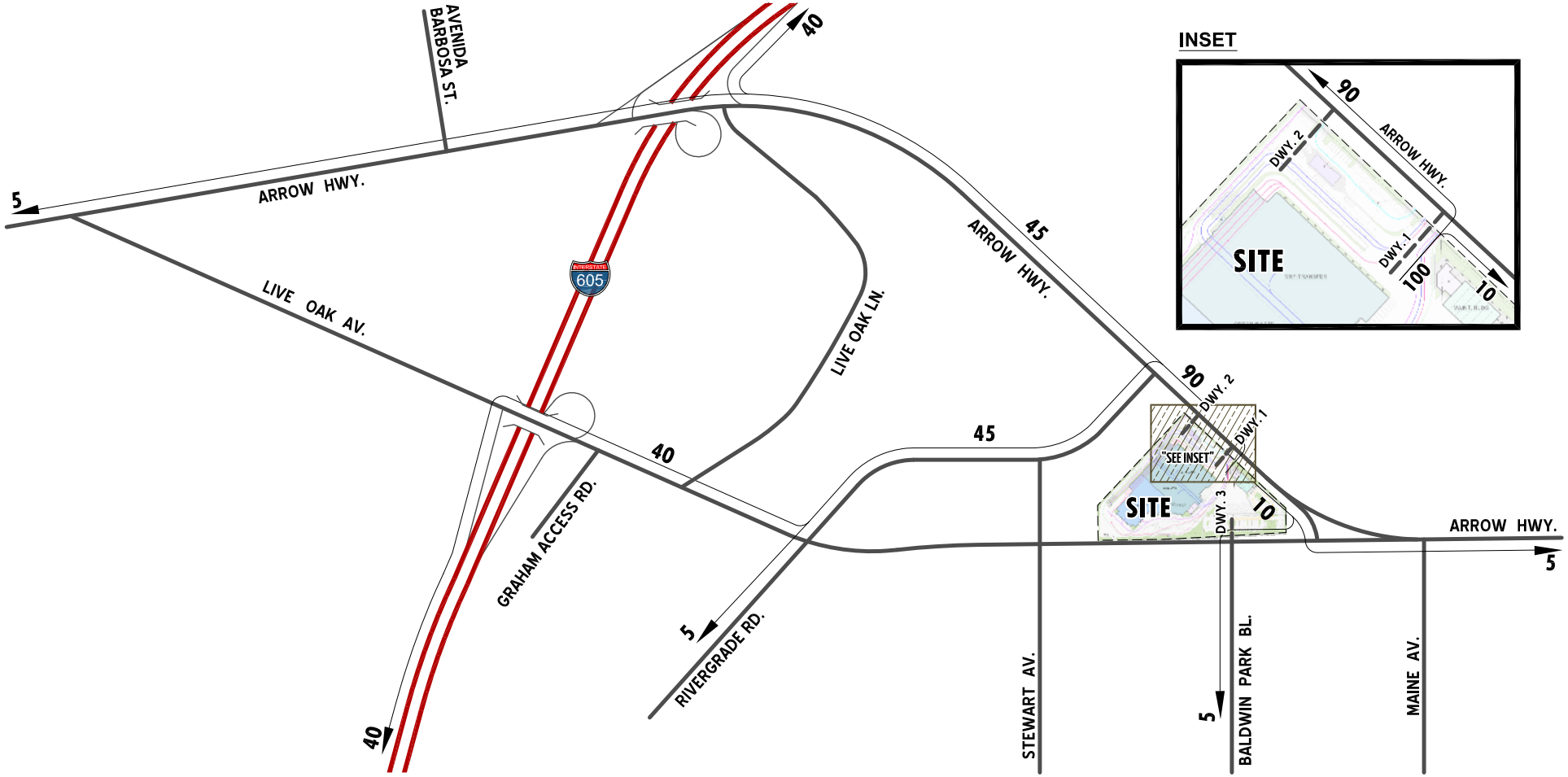
LEGEND:

10 = PERCENT TO PROJECT

N

EXHIBIT 4

SELF HAUL/CONTRACTOR TRUCK OUTBOUND TRIP DISTRIBUTION



A-9

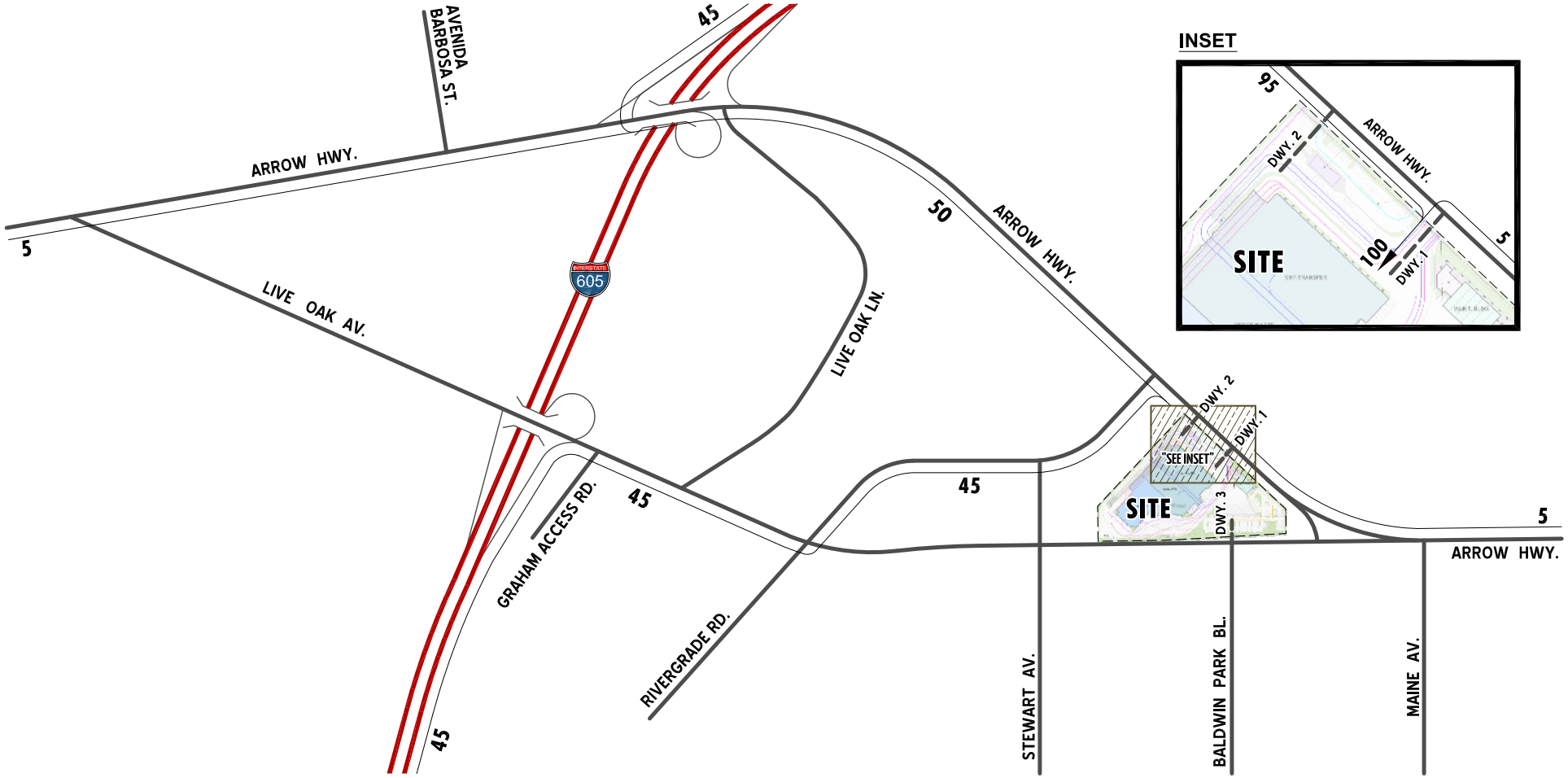
LEGEND:

10 = PERCENT FROM PROJECT

N

EXHIBIT 5

COLLECTION TRUCK (INCLUDING PACKER, END DUMP & ROLL-OFF TRUCKS) INBOUND TRIP DISTRIBUTION



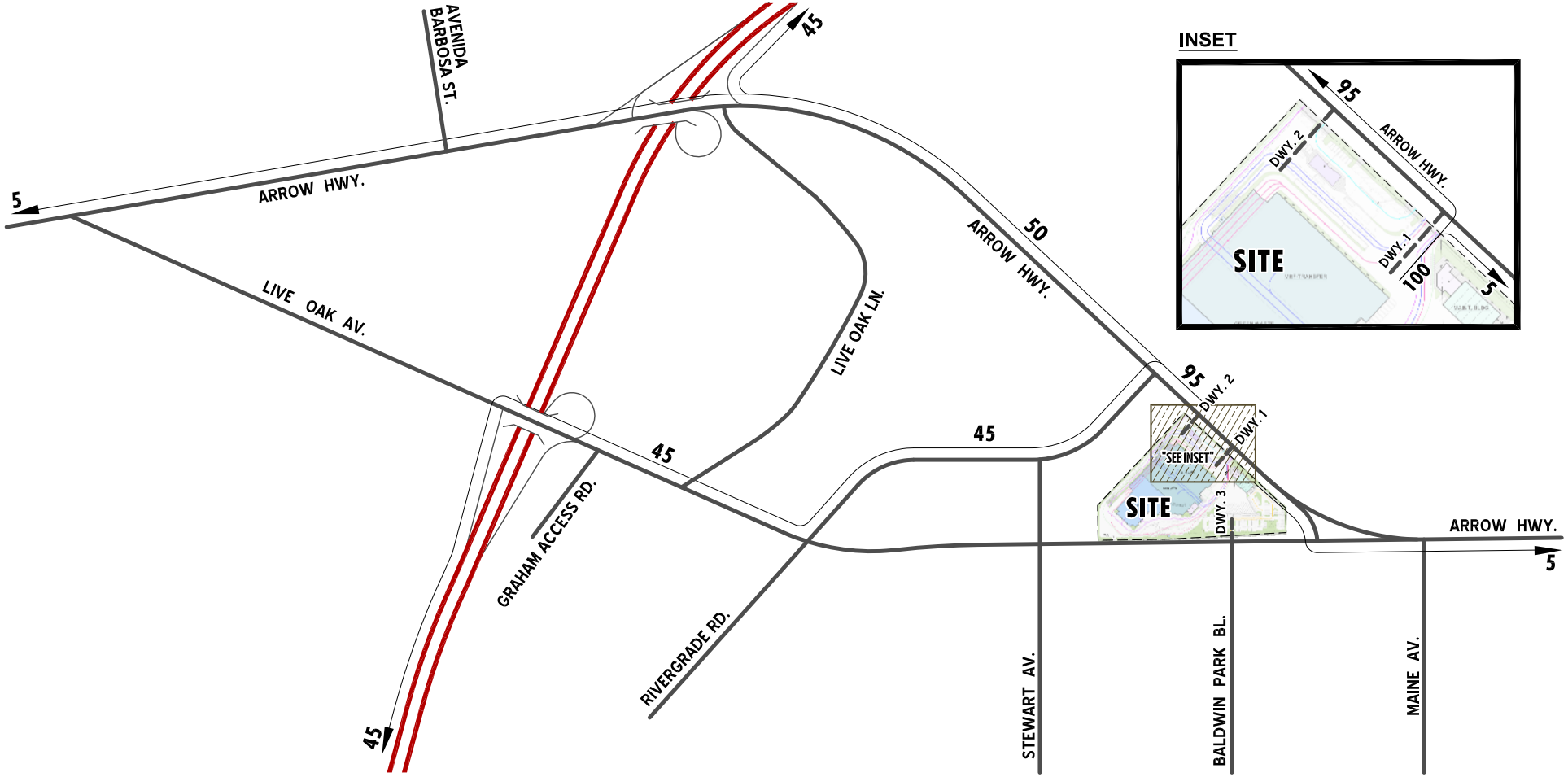
LEGEND:

10 = PERCENT TO PROJECT

N

EXHIBIT 6

COLLECTION TRUCK (INCLUDING PACKER, END DUMP & ROLL-OFF TRUCKS) OUTBOUND TRIP DISTRIBUTION



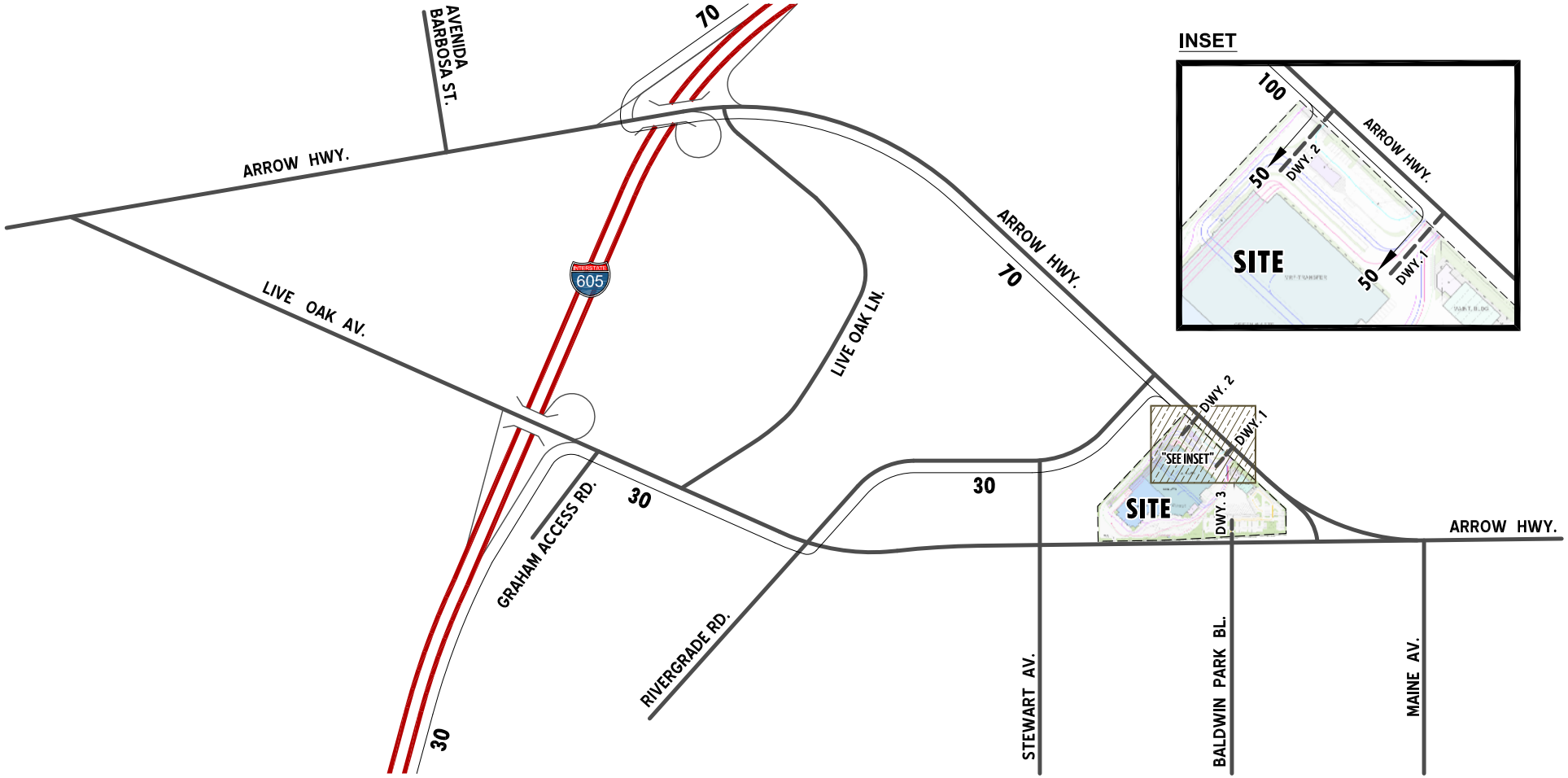
LEGEND:

10 = PERCENT FROM PROJECT

N

EXHIBIT 7

TRANSFER & RECYCLABLE LOADOUT TRUCKS INBOUND TRIP DISTRIBUTION



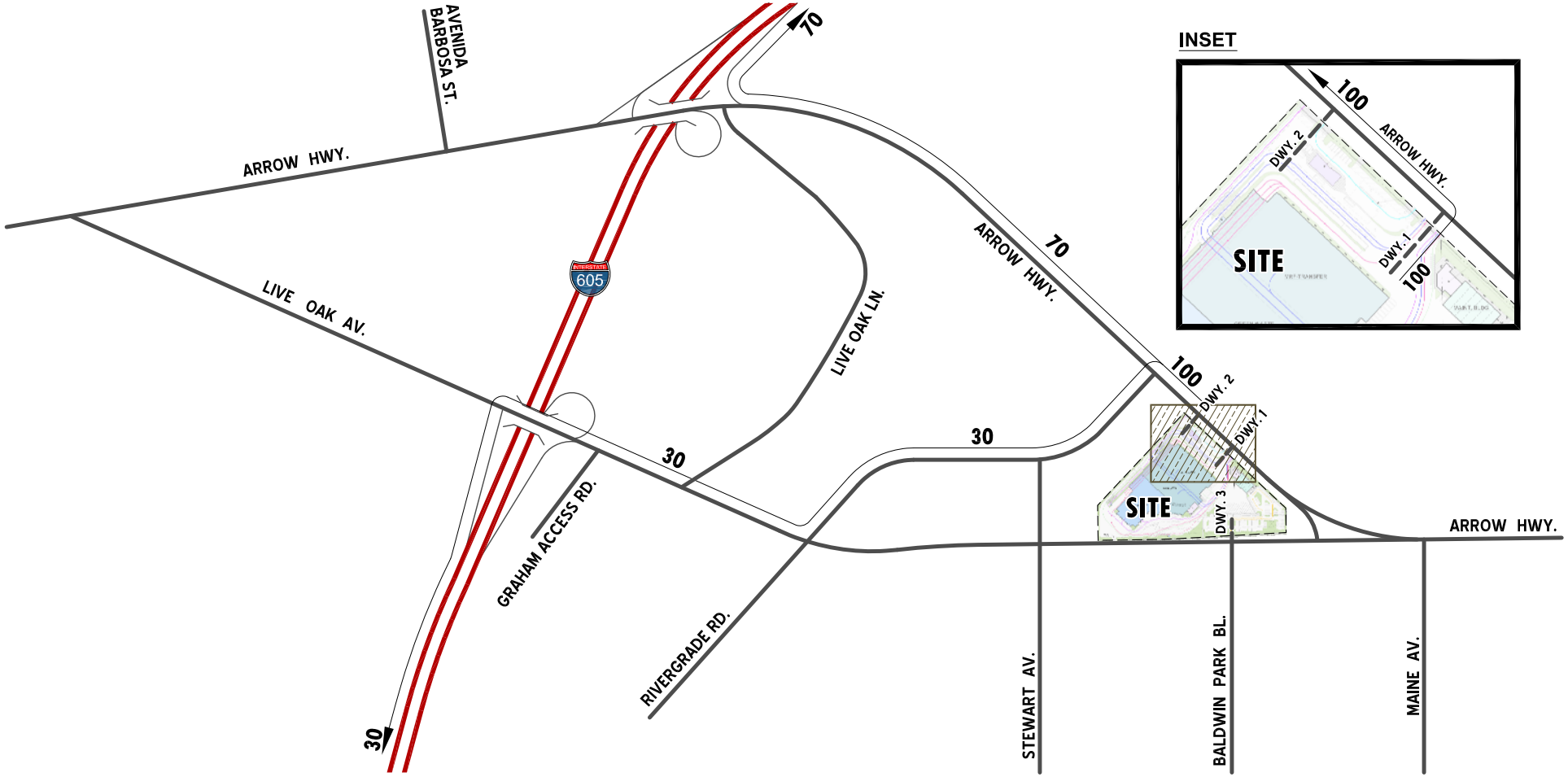
LEGEND:

10 = PERCENT TO PROJECT

N

EXHIBIT 8

TRANSFER & RECYCLABLE LOADOUT TRUCKS OUTBOUND TRIP DISTRIBUTION



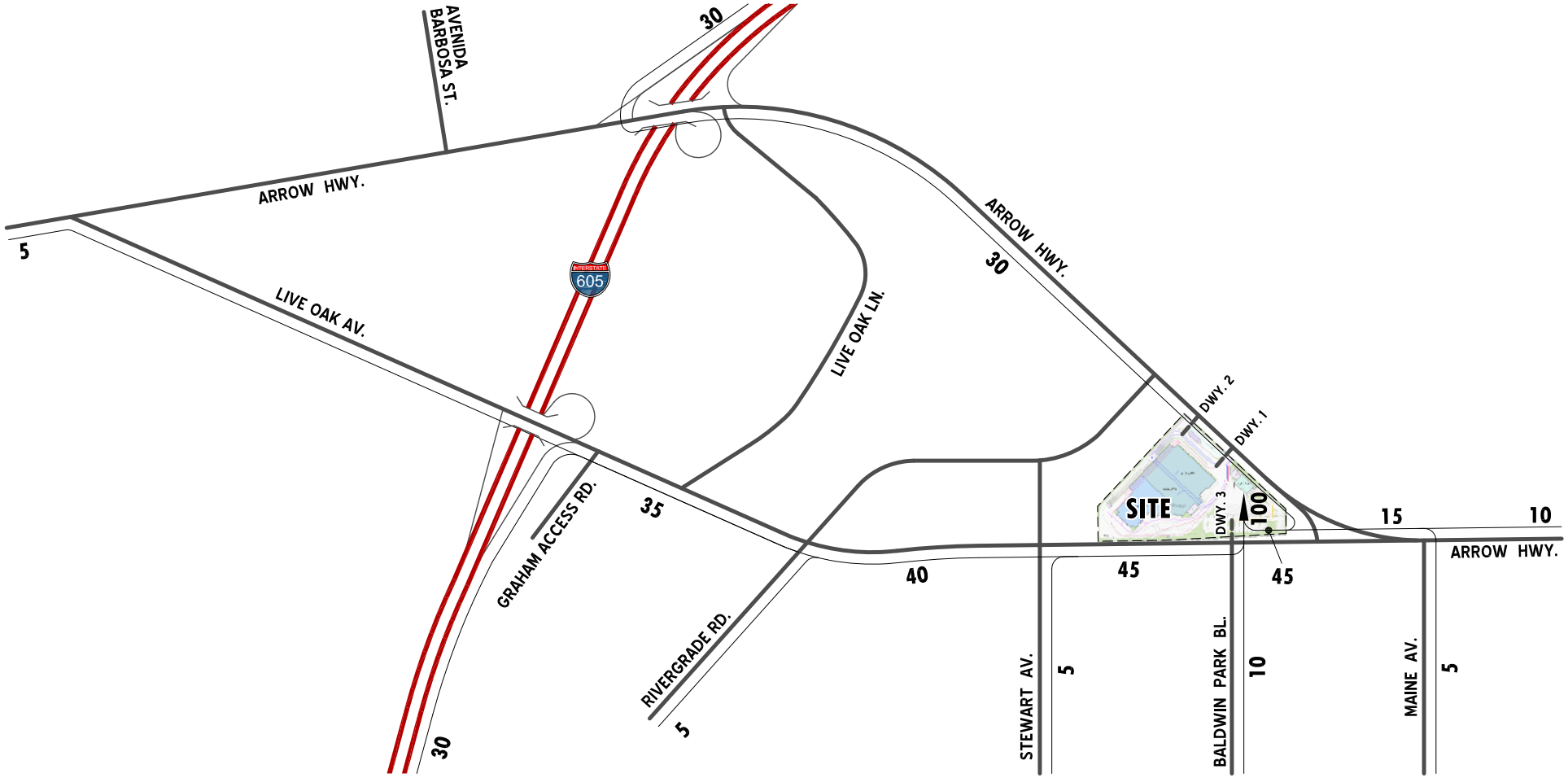
LEGEND:

10 = PERCENT FROM PROJECT

N

EXHIBIT 9

EMPLOYEE (PASSENGER CAR) INBOUND TRIP DISTRIBUTION



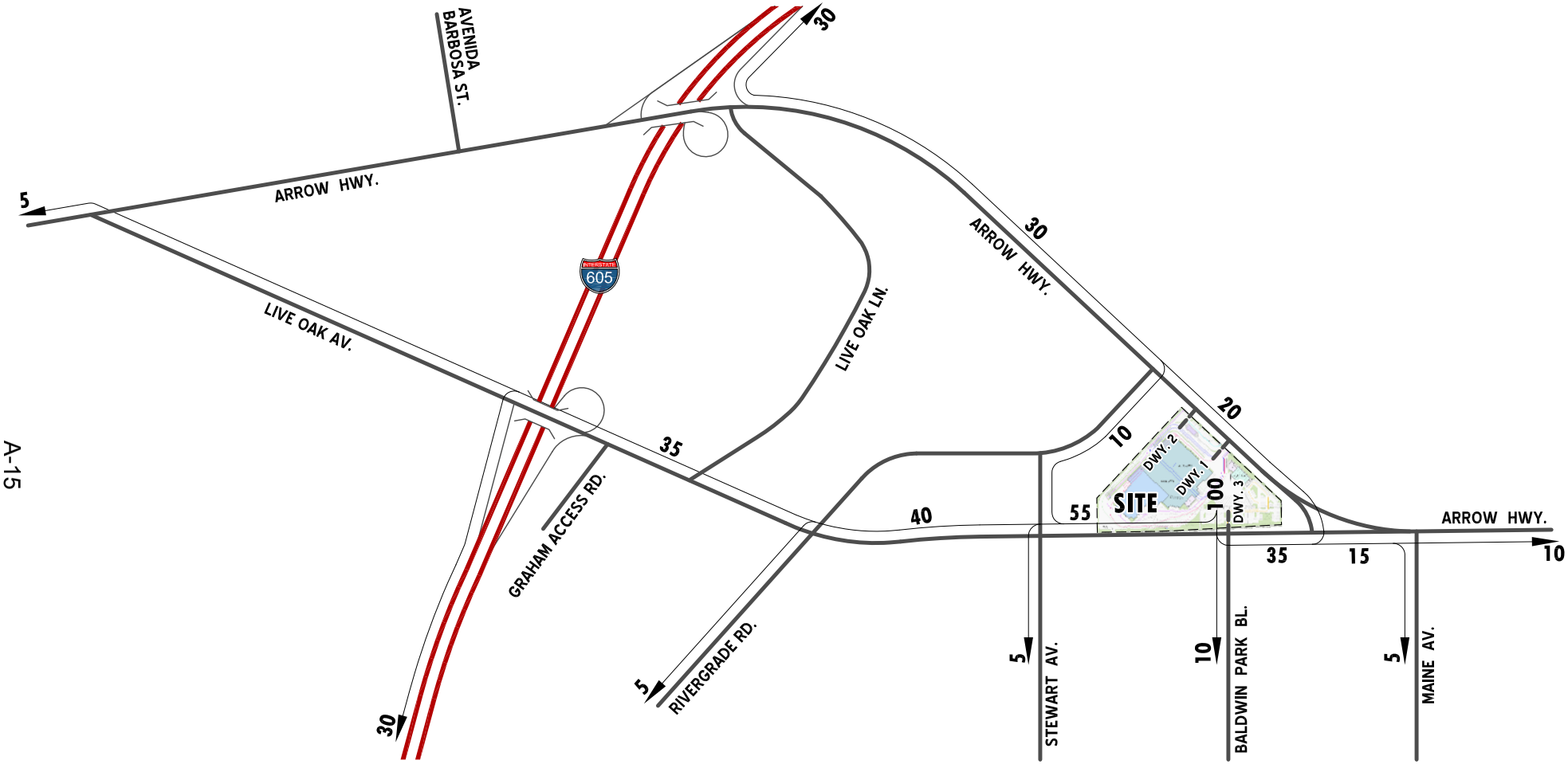
LEGEND:

10 = PERCENT TO PROJECT

N

EXHIBIT 10

EMPLOYEE (PASSENGER CAR) OUTBOUND TRIP DISTRIBUTION



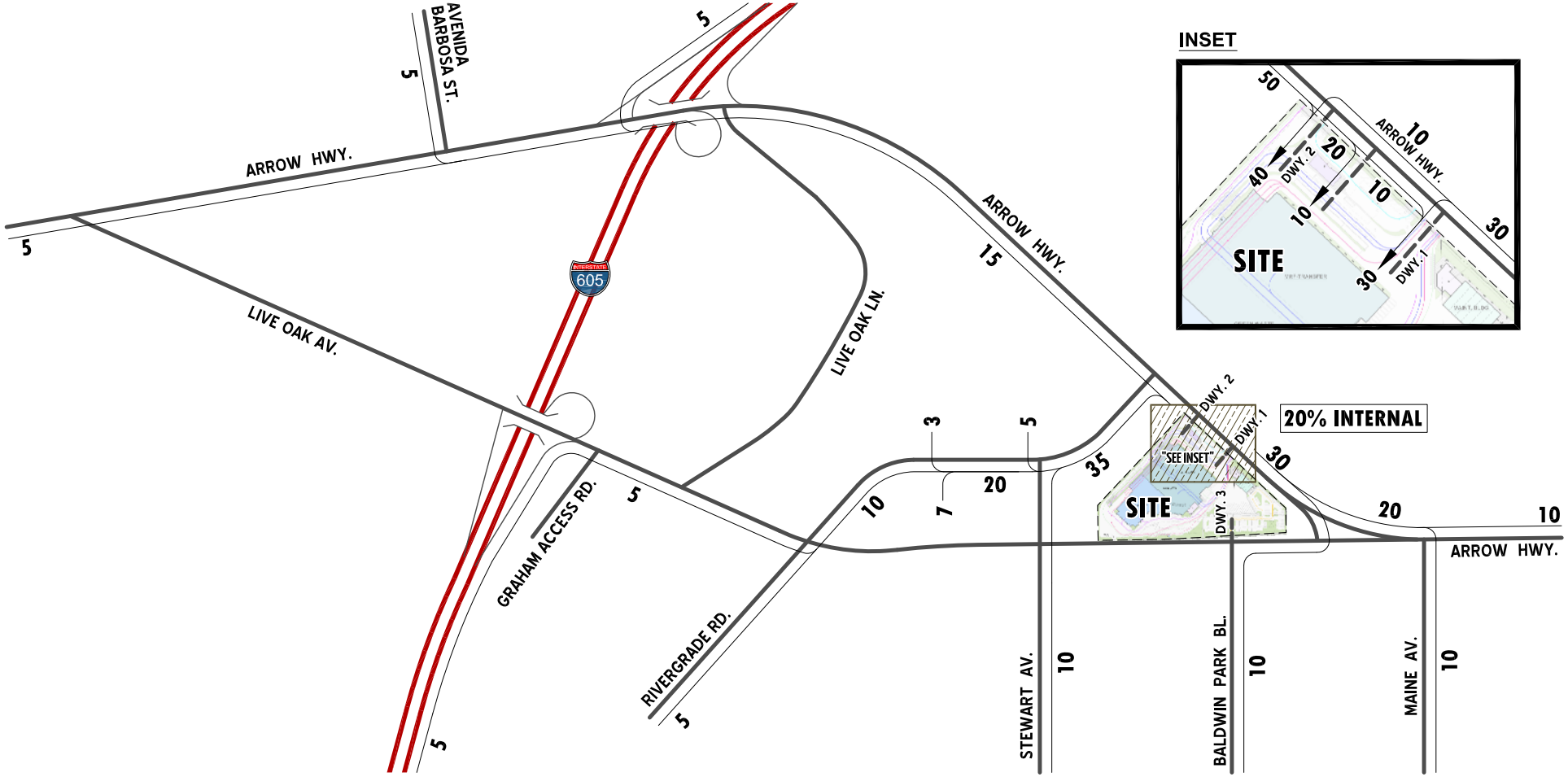
LEGEND:

10 = PERCENT FROM PROJECT

N

EXHIBIT 11

CONVENIENCE STORE/FUELING FACILITY
INBOUND TRIP DISTRIBUTION



LEGEND:

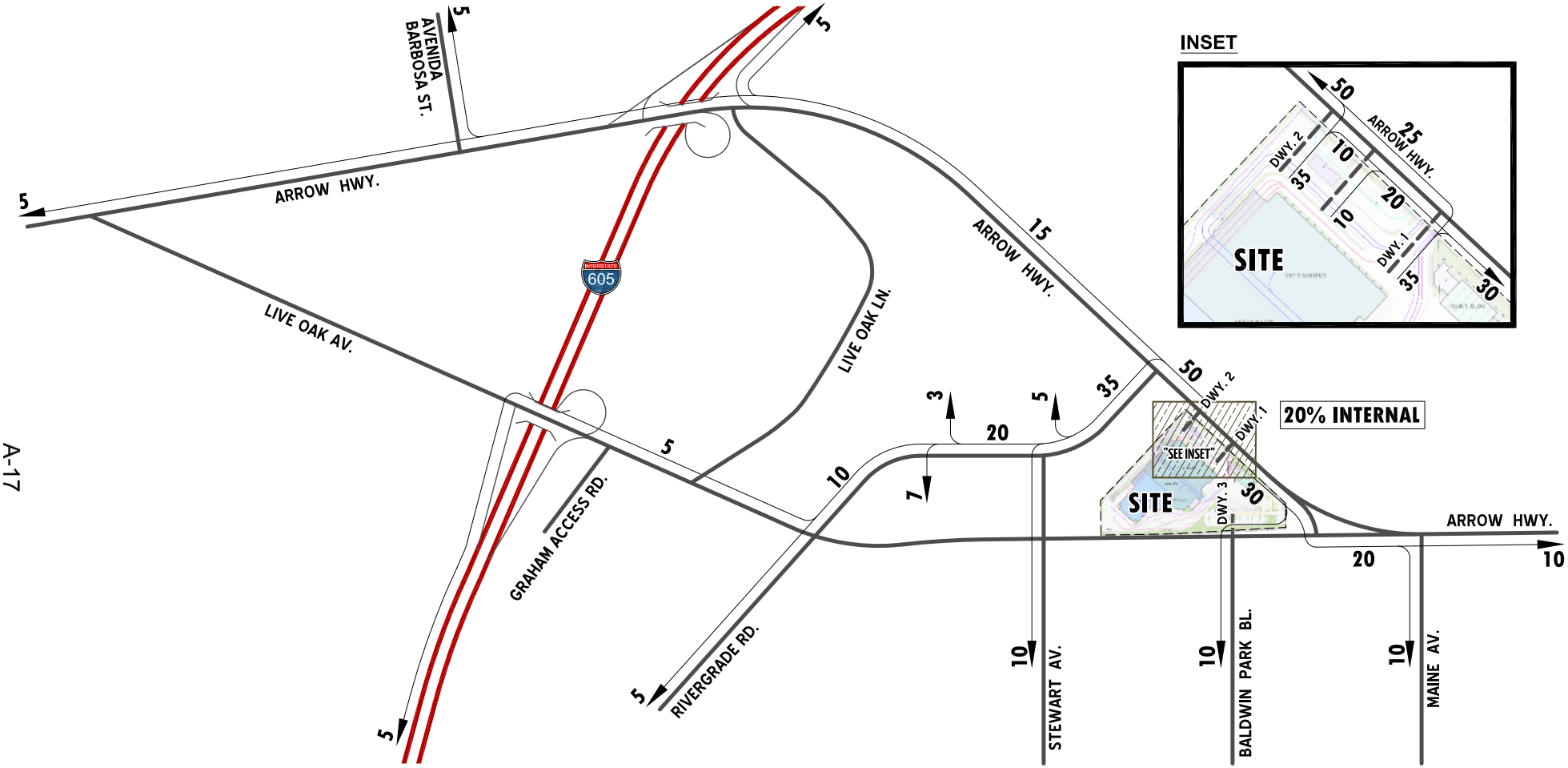
10 = PERCENT TO PROJECT

NOTE: TRIP DISTRIBUTION APPLIES TO ADDED TRIPS, NOT PASS-BY TRIPS WHICH ARE ALREADY ON THE ROADWAY SYSTEM.

N

EXHIBIT 12

CONVENIENCE STORE/FUELING FACILITY OUTBOUND TRIP DISTRIBUTION



LEGEND:

10 = PERCENT FROM PROJECT

NOTE: TRIP DISTRIBUTION APPLIES TO ADDED TRIPS, NOT PASS-BY TRIPS WHICH ARE ALREADY ON THE ROADWAY SYSTEM.

N

EXHIBIT 13

SITE ACCESS RECOMMENDATIONS

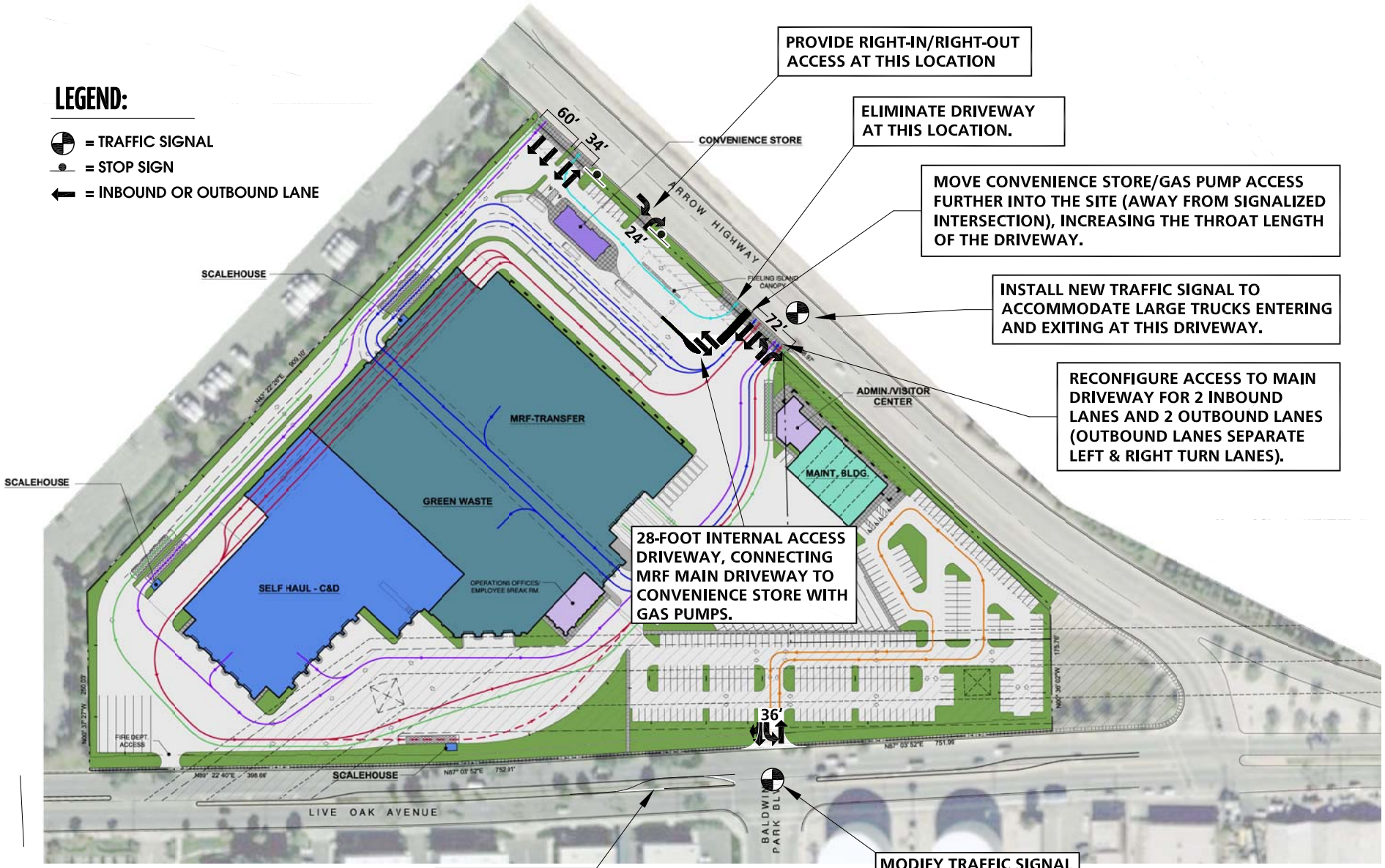
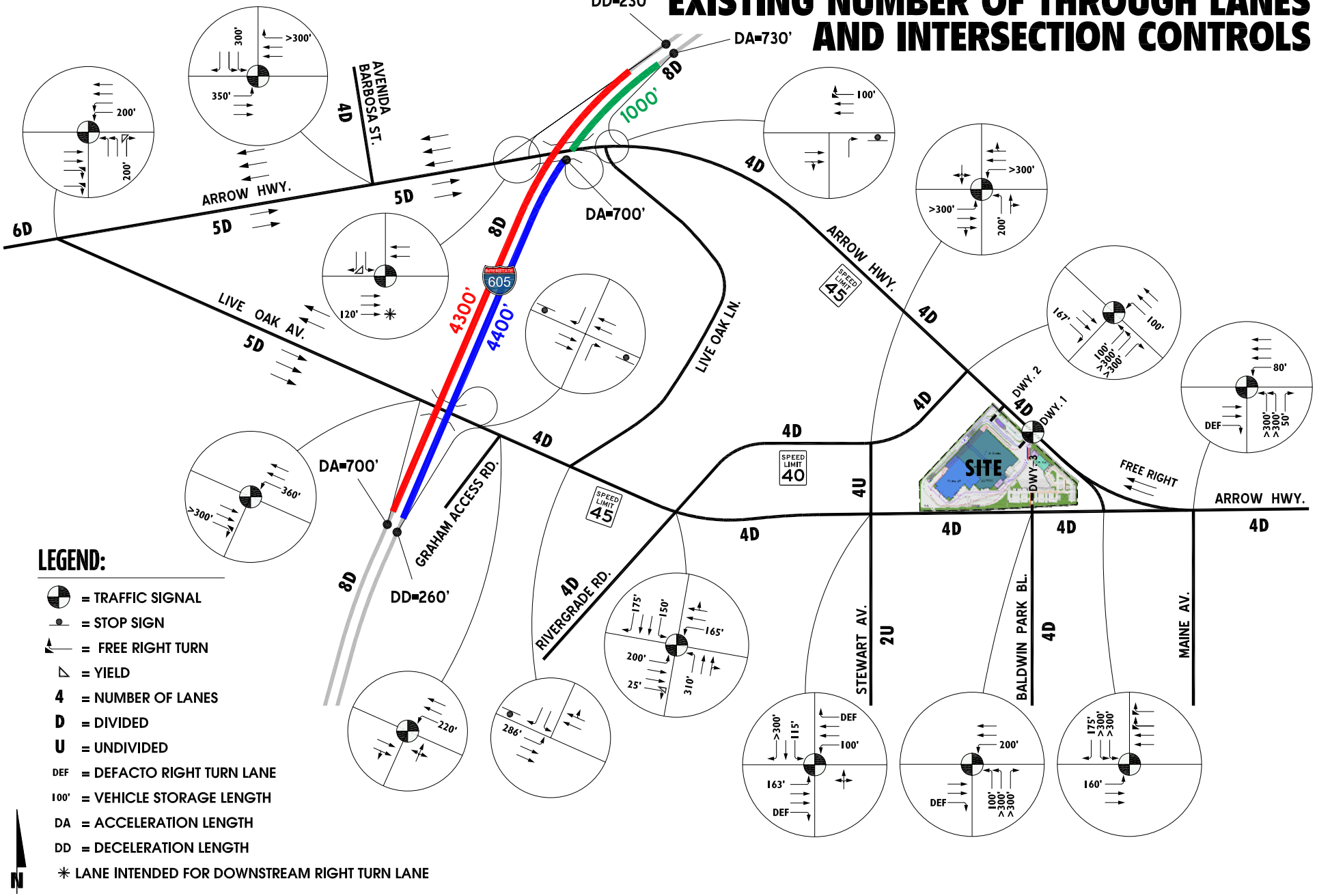


EXHIBIT 14

EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



LEGEND:

- = TRAFFIC SIGNAL
- = STOP SIGN
- = FREE RIGHT TURN
- = YIELD
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- DEF = DEFACTO RIGHT TURN LANE
- 100' = VEHICLE STORAGE LENGTH
- DA = ACCELERATION LENGTH
- DD = DECELERATION LENGTH
- ✳ LANE INTENDED FOR DOWNSTREAM RIGHT TURN LANE

N

EXHIBIT 15

EXISTING AM PEAK HOUR INTERSECTION VOLUMES

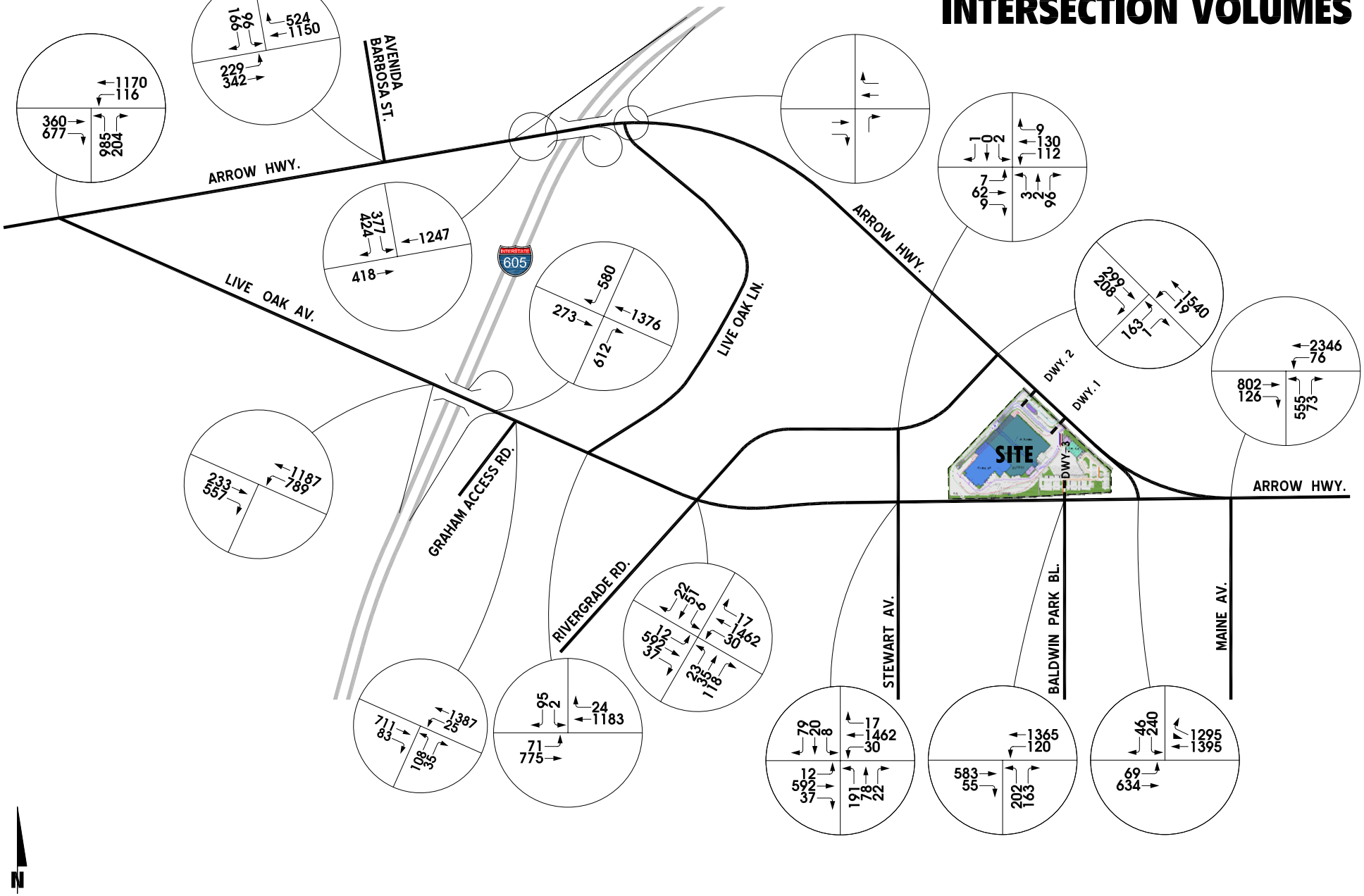
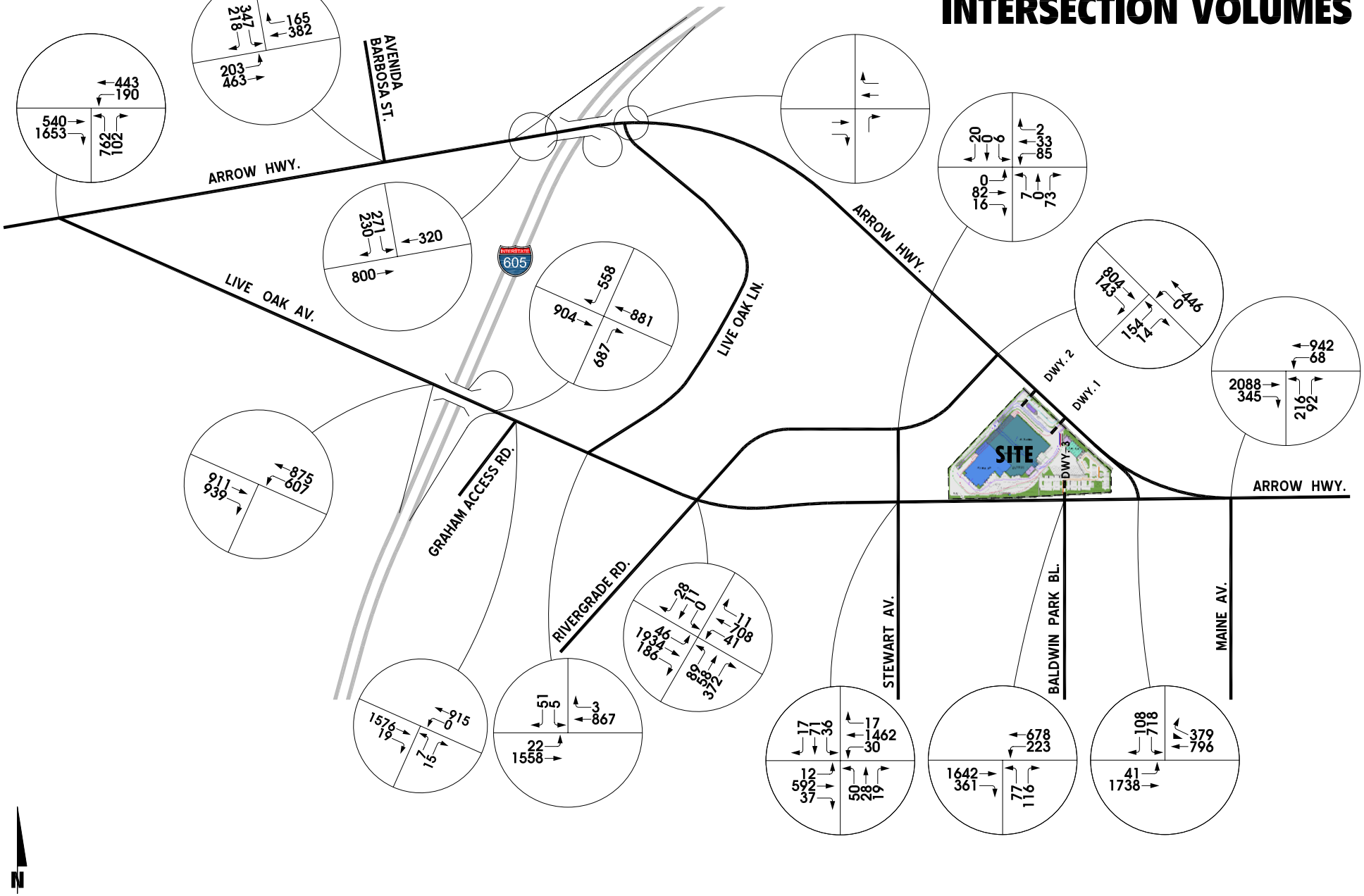


EXHIBIT 16

EXISTING PM PEAK HOUR INTERSECTION VOLUMES



A-21

TABLE 1
PROJECT TRIP GENERATION RATES

LAND USE	UNIT[1]	AM PEAK HOUR			PM PEAK HOUR			DAILY
		IN	OUT	TOTAL	IN	OUT	TOTAL	
Truck Trips - 2-axle[2]	Site TPD	0.002	0.003	0.005	0.002	0.002	0.004	0.041
Truck Trips - 3-axle[2]	Site TPD	0.008	0.009	0.017	0.013	0.010	0.024	0.275
Truck Trips - 4-axle[2]	Site TPD	0.004	0.004	0.008	0.002	0.002	0.004	0.093
Employees (Passenger Cars)[3]	EMP	0.274	0.102	0.376	0.149	0.189	0.338	2.000
Convenience Store (ITE LU 853)	TSF	20.46	20.46	40.92	25.46	25.46	50.92	845.60

[1] Site TPD = Tons Per Day for entire site - Appendix A shows empirical data calculations used to develop trip rates; EMP = Employees; TSF = Thousand Square Feet

[2] Daily and peak hour quantities have been obtained from empirical data for similar uses, applied to the site maximum processing of 6,000TPD.

[3] Daily quantities assume 2 trips / employee. AM and PM peak hour to daily relationships have been based on ITE Land Use Code "140 EMP" (Manufacturing)

TABLE 2
PROJECT BUILDOUT (2016) TRIP GENERATION SUMMARY

LAND USE	COMMODITY DIRECTION	QUANTITY	UNIT[1]	AM PEAK HOUR IN	AM PEAK HOUR OUT	AM PEAK HOUR TOTAL	PM PEAK HOUR IN	PM PEAK HOUR OUT	PM PEAK HOUR TOTAL	DAILY
Self-Haul Trucks (525 TPD)[2] - 2-axle	INBOUND	6,000	Site TPD	12	19	31	12	12	24	249
Packer Trucks (3,812 TPD)[2] - 3-axle	*INBOUND*	*6,000*	*Site TPD*	*33*	*37*	*70*	*54*	*43*	*97*	*1,137*
End Dump Trucks (250 TPD)[2] - 3-axle	*INBOUND*	*6,000*	*Site TPD*	*2*	*2*	*4*	*3*	*3*	*6*	*66*
Roll-Off Trucks (1,496 TPD)[2] - Collection & Transfer - 3-axle	*IN / OUT*	*6,000*	*Site TPD*	*13*	*14*	*27*	*21*	*17*	*38*	*445*
Total 3-axle	IN / OUT	6,000	Site TPD	48	53	101	78	63	141	1,648
Transfer Trucks incl. Recyclable Loadout (5,918 TPD)[2] - 4-axle	OUTBOUND	6,000	Site TPD	24	24	48	9	14	23	559
NET TRUCK TRIPS:				**84**	**96**	**180**	**99**	**89**	**188**	**2,456**
Self-Haul Trucks (PCE = Truck x 1.5)				*18*	*29*	*47*	*18*	*18*	*36*	*374*
Collection (Packer and End Dump) and all Roll-Off Trucks (PCE = Truck x 2.7)				*130*	*143*	*273*	*211*	*170*	*381*	*4,450*
Transfer Trucks (PCE = Truck x 3.7)				*89*	*89*	*178*	*33*	*52*	*85*	*2,068*
NET TRUCK TRIPS (PCE):				**237**	**261**	**498**	**262**	**240**	**502**	**6,892**
Employees (Total of 345 Employees daily)[3]				95	35	130	51	65	117	690
Transfer Station Subtotal (PCE)[5]				***332***	***296***	***628***	***313***	***305***	***619***	***7,582***
Convenience Market W/Pumps		2.4	TSF	49	49	98	61	61	122	2,029
- Pass by (63%)[4]				*-31*	*-31*	*-62*	*-38*	*-38*	*-77*	*-1,279*
Convenience Market W/Pumps Subtotal				***18***	***18***	***36***	***23***	***23***	***45***	***751***
TOTAL PROJECT TRIPS (PCE)[5]				**350**	**314**	**664**	**336**	**328**	**664**	**8,333**

[1] Site TPD = Tons Per Day for entire site - Appendix A shows empirical data calculations used to develop trip rates; EMP = Employees; TSF = Thousand Square Feet

[2] Daily and peak hour rates obtained from empirical data for similar uses, are applied to the site maximum processing of 6,000TPD. 3-axle trip gen by truck type is factored based on TPD for each type.

[3] Daily quantities assume 2 trips / employee. AM and PM peak hour to daily relationships have been based on ITE Land Use Code "140 EMP" (Manufacturing)

[4] Pass by % is based on Table 5-12 from the ITE Trip Generation Handbook 2nd Edition (2004)

[5] TOTAL TRIPS (PCE) = Net Truck Trips (PCE) + Employees + Convenience Market W/Pumps.

TABLE 3

INTERSECTION ANALYSIS LOCATIONS

INTERSECTION
1 - Live Oak Avenue (West) (NS) at Arrow Highway (EW)
2 - Avenida Barbosa Road (NS) at Arrow Highway (EW)
3 - I-605 Freeway SB Off Ramp (NS) at Arrow Highway (EW)
4 - Live Oak Lane / I-605 Freeway NB On Ramp (NS) at Arrow Highway (EW)
5 - Rivergrade Road (NS) at Arrow Highway (EW)
6 - Stewart Avenue (NS) at Rivergrade Road (EW)
7 - I-605 Freeway SB On Ramp (NS) at Live Oak Avenue (EW)
8 - I-605 Freeway NB Off Ramp (NS) at Live Oak Avenue (EW)
9 - Graham Access Road (NS) at Live Oak Avenue (EW)
10 - Live Oak Lane (Private Road) (NS) at Live Oak Avenue (EW)
11 - Rivergrade Road (NS) at Live Oak Avenue (EW)
12 - Stewart Avenue (NS) at Live Oak Avenue (EW)
13 - Baldwin Park Boulevard (NS) at Live Oak Avenue (EW)
14 - Arrow Highway (NS) at Live Oak Avenue (EW)
15 - Maine Avenue (NS) at Arrow Highway (EW)
16 - Driveway 1 (NS) at Arrow Highway (EW)
17 - Driveway 2 (NS) at Arrow Highway (EW)

ATTACHMENT 1

TRIP GENERATION EMPIRICAL DATA

TRIP GENERATION RATES FOR TRANSFER STATION LAND USE

2-AXLE TRUCKS

TRIP RATES	AM PEAK HOUR			PM PEAK HOUR			DAILY
	IN	OUT	TOTAL	IN	OUT	TOTAL	
Site 1	0.003	0.004	0.007	0.002	0.003	0.005	0.026
Site 2	0.002	0.003	0.005	0.002	0.002	0.004	0.017
Site 3	0.004	0.004	0.007	0.002	0.002	0.004	0.050
Site 4	0.001	0.002	0.003	0.002	0.001	0.003	0.054
STATISTICS BY TONS PER DAY							
Weighted Average Trips	0.002	0.003	0.005	0.002	0.002	0.004	0.041
Mean Trip Rate	0.003	0.003	0.005	0.002	0.002	0.004	0.037
Standard Deviation	0.001	0.001	0.002	0.000	0.001	0.001	0.016
Avg Pk % of Daily			12.6%			9.7%	

3-AXLE TRUCKS

TRIP RATES	AM PEAK HOUR			PM PEAK HOUR			DAILY
	IN	OUT	TOTAL	IN	OUT	TOTAL	
Site 1	0.018	0.015	0.033	0.015	0.016	0.031	0.307
Site 2	0.005	0.005	0.010	0.017	0.012	0.029	0.189
Site 3	0.009	0.008	0.017	0.003	0.002	0.005	0.126
Site 4	0.004	0.008	0.012	0.019	0.015	0.034	0.435
STATISTICS BY TONS PER DAY							
Weighted Average Trips	0.008	0.009	0.017	0.013	0.010	0.024	0.275
Mean Trip Rate	0.009	0.009	0.018	0.014	0.011	0.025	0.264
Standard Deviation	0.005	0.004	0.009	0.006	0.006	0.012	0.118
Avg Pk % of Daily			6.2%			8.6%	

4-AXLE TRUCKS

TRIP RATES	AM PEAK HOUR			PM PEAK HOUR			DAILY
	IN	OUT	TOTAL	IN	OUT	TOTAL	
Site 1	0.004	0.004	0.009	0.003	0.004	0.008	0.094
Site 2	0.005	0.005	0.009	0.001	0.004	0.005	0.076
Site 3	0.008	0.003	0.011	0.003	0.001	0.003	0.102
Site 4	0.000	0.004	0.004	0.000	0.002	0.002	0.093
STATISTICS BY TONS PER DAY							
Weighted Average Trips	0.004	0.004	0.008	0.002	0.002	0.004	0.093
Mean Trip Rate	0.004	0.004	0.008	0.002	0.003	0.004	0.091
Standard Deviation	0.003	0.000	0.003	0.001	0.002	0.002	0.010
Avg Pk % of Daily			8.6%			4.1%	

U:\UcJobs_08100-08500_08500\08517\Excel\[08517-03 TG Appendix.xls]TRIP GEN CALCS

DRIVEWAY COUNT DATA SUMMARY BY SITE

DAY OF	SITE 1				SITE 2				SITE 3				SITE 4			
THE WEEK	IN	OUT	TOTAL	DAILY	IN	OUT	TOTAL	DAILY	IN	OUT	TOTAL	DAILY	IN	OUT	TOTAL	DAILY
AM PEAK HOUR																
Tuesday	60	47	107		32	20	52		65	49	114		26	39	65	
Wednesday	40	38	78		27	27	54		148	33	181		33	51	84	
Thursday	38	38	76	788	27	24	51	529	77	67	144	1,141	18	63	81	1,115
AVERAGE	46	41	87		29	24	52		97	50	146		26	51	77	
TRIP RATE	0.031	0.027	0.058	0.525	0.019	0.016	0.035	0.353	0.036	0.018	0.054	0.423	0.009	0.017	0.026	0.372
PM PEAK HOUR																
Tuesday	34	41	75		41	42	83		49	31	80		58	55	113	
Wednesday	43	45	88		29	24	53		17	52	69		77	71	148	
Thursday	33	40	73		34	37	71		43	35	78		77	60	137	
AVERAGE	37	42	79		35	34	69		36	39	76		71	62	133	
TRIP RATE	0.024	0.028	0.052		0.023	0.023	0.046		0.013	0.015	0.028		0.024	0.021	0.044	

SUMMARY OF INDEPENDENT VARIABLES:

SITE 1:	1,500	tons/day
SITE 2:	1,500	tons/day
SITE 3:	2,700	tons/day
SITE 4:	3,000	tons/day
	8,700	tons/day

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	1	0	3	1	5	0	0	1	1	2
6:15-6:30	1	0	10	2	13	2	0	8	2	12
6:30-6:45	0	0	15	1	16	0	0	15	0	15
6:45-7:00	0	0	5	2	7	0	0	12	2	14
7:00-7:15	0	2	2	1	5	0	1	3	2	6
7:15-7:30	3	0	1	3	7	0	2	1	2	5
7:30-7:45	2	1	3	2	8	0	0	1	2	3
7:45-8:00	5	0	2	1	8	0	0	1	2	3
8:00-8:15	1	0	2	1	4	1	0	3	1	5
8:15-8:30	3	0	1	0	4	0	1	2	1	4
8:30-8:45	4	2	8	1	15	2	1	3	0	6
8:45-9:00	6	0	6	2	14	0	0	3	2	5
9:00-9:15	2	4	7	3	16	5	5	9	2	21
9:15-9:30	3	4	5	3	15	3	3	5	4	15
9:30-9:45	1	0	6	2	9	3	0	2	1	6
9:45-10:00	2	1	5	3	11	1	0	6	2	9
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	2	0	33	6	41	2	0	36	5	43
6:15-7:15	1	2	32	6	41	2	1	38	6	47
6:30-7:30	3	2	23	7	35	0	3	31	6	40
6:45-7:45	5	3	11	8	27	0	3	17	8	28
7:00-8:00	10	3	8	7	28	0	3	6	8	17
7:15-8:15	11	1	8	7	27	1	2	6	7	16
7:30-8:30	11	1	8	4	24	1	1	7	6	15
7:45-8:45	13	2	13	3	31	3	2	9	4	18
8:00-9:00	14	2	17	4	37	3	2	11	4	20
8:15-9:15	15	6	22	6	49	7	7	17	5	36
8:30-9:30	15	10	26	9	**60**	10	9	20	8	**47**
8:45-9:45	12	8	24	10	54	11	8	19	9	47
9:00-10:00	8	9	23	11	51	12	8	22	9	51

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	1	3	1	7	3	2	3	1	9
3:15-3:30	0	0	6	1	7	3	0	4	2	9
3:30-3:45	1	0	1	1	3	1	0	6	1	8
3:45-4:00	1	3	11	2	17	3	1	6	1	11
4:00-4:15	2	2	1	2	7	0	4	8	1	13
4:15-4:30	0	2	1	1	4	2	1	2	2	7
4:30-4:45	0	1	1	1	3	0	4	2	2	8
4:45-5:00	0	0	1	2	3	0	0	6	1	7
5:00-5:15	0	2	1	0	3	4	2	5	3	14
5:15-5:30	0	0	0	2	2	1	0	1	0	2
5:30-5:45	0	0	2	0	2	1	1	2	2	6
5:45-6:00	0	0	1	0	1	5	0	0	0	5
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	4	4	21	5	34	10	3	19	5	37
3:15-4:15	4	5	19	6	**34**	7	5	24	5	**41**
3:30-4:30	4	7	14	6	31	6	6	22	5	39
3:45-4:45	3	8	14	6	31	5	10	18	6	39
4:00-5:00	2	5	4	6	17	2	9	18	6	35
4:15-5:15	0	5	4	4	13	6	7	15	8	36
4:30-5:30	0	3	3	5	11	5	6	14	6	31
4:45-5:45	0	2	4	4	10	6	3	14	6	29
5:00-6:00	0	2	4	2	8	11	3	8	5	27

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	1	1	2	2	0	2	2	6
6:15-6:30	1	0	4	0	5	0	0	3	0	3
6:30-6:45	0	0	1	0	1	0	0	0	0	0
6:45-7:00	1	1	2	0	4	0	0	1	0	1
7:00-7:15	0	1	6	2	9	0	1	4	1	6
7:15-7:30	1	1	4	0	6	0	0	8	2	10
7:30-7:45	0	0	3	3	6	0	0	2	1	3
7:45-8:00	2	0	1	1	4	0	1	1	2	4
8:00-8:15	4	1	1	1	7	2	1	3	1	7
8:15-8:30	4	0	3	1	8	1	1	1	1	4
8:30-8:45	3	3	2	1	9	1	0	2	2	5
8:45-9:00	3	3	8	1	15	1	3	4	1	9
9:00-9:15	2	1	6	1	10	3	3	5	1	12
9:15-9:30	2	0	5	2	9	2	1	3	2	8
9:30-9:45	0	0	4	2	6	1	1	5	2	9
9:45-10:00	1	0	3	2	6	2	0	3	2	7
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	2	1	8	1	12	2	0	6	2	10
6:15-7:15	2	2	13	2	19	0	1	8	1	10
6:30-7:30	2	3	13	2	20	0	1	13	3	17
6:45-7:45	2	3	15	5	25	0	1	15	4	20
7:00-8:00	3	2	14	6	25	0	2	15	6	23
7:15-8:15	7	2	9	5	23	2	2	14	6	24
7:30-8:30	10	1	8	6	25	3	3	7	5	18
7:45-8:45	13	4	7	4	28	4	3	7	6	20
8:00-9:00	14	7	14	4	39	5	5	10	5	25
8:15-9:15	12	7	19	4	42	6	7	12	5	30
8:30-9:30	10	7	21	5	43	7	7	14	6	34
8:45-9:45	7	4	23	6	**40**	7	8	17	6	**38**
9:00-10:00	5	1	18	7	31	8	5	16	7	36

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	4	2	5	0	11	4	2	1	1	8
3:15-3:30	1	0	6	1	8	3	2	4	0	9
3:30-3:45	2	1	9	2	14	4	1	11	2	18
3:45-4:00	1	1	6	1	9	1	1	6	1	9
4:00-4:15	4	0	3	2	9	2	0	4	3	9
4:15-4:30	3	1	8	2	14	2	0	3	1	6
4:30-4:45	1	1	7	0	9	2	2	9	1	14
4:45-5:00	3	0	8	0	11	5	0	9	2	16
5:00-5:15	0	0	2	1	3	0	0	4	0	4
5:15-5:30	0	0	3	2	5	3	0	4	2	9
5:30-5:45	0	0	0	1	1	3	0	2	2	7
5:45-6:00	0	0	0	1	1	0	0	0	1	1
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	8	4	26	4	42	12	6	22	4	44
3:15-4:15	8	2	24	6	40	10	4	25	6	45
3:30-4:30	10	3	26	7	46	9	2	24	7	42
3:45-4:45	9	3	24	5	41	7	3	22	6	38
4:00-5:00	11	2	26	4	**43**	11	2	25	7	**45**
4:15-5:15	7	2	25	3	37	9	2	25	4	40
4:30-5:30	4	1	20	3	28	10	2	26	5	43
4:45-5:45	3	0	13	4	20	11	0	19	6	36
5:00-6:00	0	0	5	5	10	6	0	10	5	21

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	2	1	3	1	0	1	1	3
6:15-6:30	1	1	13	1	16	0	0	7	0	7
6:30-6:45	0	0	8	2	10	0	1	10	2	13
6:45-7:00	0	0	7	1	8	1	0	10	2	13
7:00-7:15	0	0	3	1	4	0	0	4	1	5
7:15-7:30	2	0	1	0	3	0	0	2	0	2
7:30-7:45	1	0	1	2	4	0	0	0	1	1
7:45-8:00	0	0	2	1	3	0	0	2	1	3
8:00-8:15	1	1	4	1	7	1	0	1	1	3
8:15-8:30	0	0	2	0	2	0	0	5	1	6
8:30-8:45	3	0	5	1	9	4	0	3	2	9
8:45-9:00	2	4	6	1	13	1	2	4	0	7
9:00-9:15	1	0	3	1	5	3	0	5	2	10
9:15-9:30	2	0	5	3	10	1	0	4	0	5
9:30-9:45	2	1	8	2	13	2	0	4	4	10
9:45-10:00	1	0	4	2	7	0	0	6	3	9
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	1	1	30	5	37	2	1	28	5	36
6:15-7:15	1	1	31	5	**38**	1	1	31	5	**38**
6:30-7:30	2	0	19	4	25	1	1	26	5	33
6:45-7:45	3	0	12	4	19	1	0	16	4	21
7:00-8:00	3	0	7	4	14	0	0	8	3	11
7:15-8:15	4	1	8	4	17	1	0	5	3	9
7:30-8:30	2	1	9	4	16	1	0	8	4	13
7:45-8:45	4	1	13	3	21	5	0	11	5	21
8:00-9:00	6	5	17	3	31	6	2	13	4	25
8:15-9:15	6	4	16	3	29	8	2	17	5	32
8:30-9:30	8	4	19	6	37	9	2	16	4	31
8:45-9:45	7	5	22	7	41	7	2	17	6	32
9:00-10:00	6	1	20	8	35	6	0	19	9	34

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	0	0	6	1	7	1	1	4	2	8
3:15-3:30	0	2	6	3	11	0	0	5	3	8
3:30-3:45	1	1	4	1	7	2	2	6	2	12
3:45-4:00	0	1	8	0	9	0	2	6	1	9
4:00-4:15	1	0	4	1	6	1	1	7	2	11
4:15-4:30	4	0	4	3	11	1	0	2	0	3
4:30-4:45	0	2	6	1	9	3	0	5	1	9
4:45-5:00	0	0	4	0	4	0	3	6	2	11
5:00-5:15	0	0	0	1	1	1	0	4	0	5
5:15-5:30	0	0	0	2	2	1	0	1	0	2
5:30-5:45	0	0	0	2	2	0	0	2	4	6
5:45-6:00	0	0	0	1	1	0	0	0	1	1
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	1	4	24	5	34	3	5	21	8	37
3:15-4:15	2	4	22	5	**33**	3	5	24	8	**40**
3:30-4:30	6	2	20	5	33	4	5	21	5	35
3:45-4:45	5	3	22	5	35	5	3	20	4	32
4:00-5:00	5	2	18	5	30	5	4	20	5	34
4:15-5:15	4	2	14	5	25	5	3	17	3	28
4:30-5:30	0	2	10	4	16	5	3	16	3	27
4:45-5:45	0	0	4	5	9	2	3	13	6	24
5:00-6:00	0	0	0	6	6	2	0	7	5	14

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (4:00 AM - 6:00 PM - Business Day)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
4:00-4:15	0	0	0	1	1	1	0	0	0	1
4:15-4:30	1	0	1	0	2	0	0	0	0	0
4:30-4:45	0	0	4	0	4	1	0	1	0	2
4:45-5:00	2	0	1	0	3	0	0	1	1	2
5:00-5:15	3	0	1	2	6	1	0	1	0	2
5:15-5:30	0	0	2	1	3	0	0	1	2	3
5:30-5:45	0	0	2	2	4	0	0	2	1	3
5:45-6:00	1	0	0	1	2	0	0	2	2	4
6:00-6:15	0	0	2	1	3	1	0	1	1	3
6:15-6:30	1	1	13	1	16	0	0	7	0	7
6:30-6:45	0	0	8	2	10	0	1	10	2	13
6:45-7:00	0	0	7	1	8	1	0	10	2	13
7:00-7:15	0	0	3	1	4	0	0	4	1	5
7:15-7:30	2	0	1	0	3	0	0	2	0	2
7:30-7:45	1	0	1	2	4	0	0	0	1	1
7:45-8:00	0	0	2	1	3	0	0	2	1	3
8:00-8:15	1	1	4	1	7	1	0	1	1	3
8:15-8:30	0	0	2	0	2	0	0	5	1	6
8:30-8:45	3	0	5	1	9	4	0	3	2	9
8:45-9:00	6	0	6	1	13	1	2	4	0	7
9:00-9:15	1	0	3	1	5	3	0	5	2	10
9:15-9:30	2	0	5	3	10	1	0	4	0	5
9:30-9:45	2	1	8	2	13	2	0	4	4	10
9:45-10:00	1	0	4	2	7	0	0	6	3	9
10:00-10:15	2	1	8	3	14	3	2	6	2	13
10:15-10:30	4	1	5	1	11	2	1	8	1	12
10:30-10:45	2	0	4	2	8	4	0	7	2	13
10:45-11:00	2	1	7	2	12	1	0	4	1	6
11:00-11:15	1	1	6	0	8	3	2	4	1	10
11:15-11:30	1	0	7	1	9	0	0	9	1	10
11:30-11:45	3	0	3	1	7	2	0	5	0	7
11:45-12:00	3	0	3	1	7	5	0	3	2	10
12:00-12:15	3	0	9	0	12	6	0	2	1	9
12:15-12:30	2	0	4	0	6	0	0	6	0	6
12:30-12:45	2	0	1	0	3	5	0	7	0	12
12:45-1:00	4	0	4	1	9	1	0	5	0	6
1:00-1:15	0	1	6	1	8	1	0	2	1	4
1:15-1:30	3	1	4	3	11	2	1	5	1	9
1:30-1:45	2	2	2	1	7	6	0	8	2	16
1:45-2:00	0	0	4	2	6	2	1	3	4	10
2:00-2:15	1	0	8	1	10	1	1	5	1	8
2:15-2:30	0	0	6	2	8	1	0	6	1	8
2:30-2:45	0	2	4	3	9	2	0	9	3	14
2:45-3:00	4	0	6	1	11	1	0	5	1	7
3:00-3:15	0	0	6	2	8	1	1	4	2	8
3:15-3:30	0	2	6	3	11	0	0	5	3	8
3:30-3:45	1	1	4	2	8	2	2	6	2	12
3:45-4:00	0	1	8	0	9	0	2	6	1	9
4:00-4:15	1	0	4	1	6	1	1	7	2	11
4:15-4:30	4	0	4	3	11	1	0	2	0	3
4:30-4:45	0	2	6	1	9	3	0	5	1	9
4:45-5:00	0	0	4	0	4	0	3	6	2	11
5:00-5:15	0	0	0	1	1	1	0	4	0	5
5:15-5:30	0	0	0	2	2	1	0	1	0	2
5:30-5:45	0	0	0	2	2	0	0	2	4	6
5:45-6:00	0	0	0	1	1	0	0	0	1	1
TOTALS	72	19	228	71	390	75	20	233	70	398

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (4:00 AM - 6:00 PM - Business Day)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
4:00-5:00	3	0	6	1	10	2	0	2	1	5
4:15-5:15	6	0	7	2	15	2	0	3	1	6
4:30-5:30	5	0	8	3	16	2	0	4	3	9
4:45-5:45	5	0	6	5	16	1	0	5	4	10
5:00-6:00	4	0	5	6	15	1	0	6	5	12
5:15-6:15	1	0	6	5	12	1	0	6	6	13
5:30-6:30	2	1	17	5	25	1	0	12	4	17
5:45-6:45	2	1	23	5	31	1	1	20	5	27
6:00-7:00	1	1	30	5	37	2	1	28	5	36
6:15-7:15	1	1	31	5	38	1	1	31	5	38
6:30-7:30	2	0	19	4	25	1	1	26	5	33
6:45-7:45	3	0	12	4	19	1	0	16	4	21
7:00-8:00	3	0	7	4	14	0	0	8	3	11
7:15-8:15	4	1	8	4	17	1	0	5	3	9
7:30-8:30	2	1	9	4	16	1	0	8	4	13
7:45-8:45	4	1	13	3	21	5	0	11	5	21
8:00-9:00	**10**	**1**	**17**	**3**	**31**	**6**	**2**	**13**	**4**	**25**
8:15-9:15	10	0	16	3	29	8	2	17	5	32
8:30-9:30	12	0	19	6	37	9	2	16	4	31
8:45-9:45	11	1	22	7	41	7	2	17	6	32
9:00-10:00	6	1	20	8	35	6	0	19	9	34
9:15-10:15	7	2	25	10	44	6	2	20	9	37
9:30-10:30	**9**	**3**	**25**	**8**	**45**	**7**	**3**	**24**	**10**	**44**
9:45-10:45	9	2	21	8	40	9	3	27	8	47
10:00-11:00	**10**	**3**	**24**	**8**	**45**	**10**	**3**	**25**	**6**	**44**
10:15-11:15	9	3	22	5	39	10	3	23	5	41
10:30-11:30	6	2	24	5	37	8	2	24	5	39
10:45-11:45	7	2	23	4	36	6	2	22	3	33
11:00-12:00	8	1	19	3	31	10	2	21	4	37
11:15-12:15	10	0	22	3	35	13	0	19	4	36
11:30-12:30	11	0	19	2	32	13	0	16	3	32
11:45-12:45	10	0	17	1	28	16	0	18	3	37
12:00-1:00	11	0	18	1	30	12	0	20	1	33
12:15-1:15	8	1	15	2	26	7	0	20	1	28
12:30-1:30	9	2	15	5	31	9	1	19	2	31
12:45-1:45	9	4	16	6	35	10	1	20	4	35
1:00-2:00	5	4	16	7	32	11	2	18	8	39
1:15-2:15	6	3	18	7	34	11	3	21	8	43
1:30-2:30	3	2	20	6	31	10	2	22	8	42
1:45-2:45	1	2	22	8	33	6	2	23	9	40
2:00-3:00	5	2	24	7	38	5	1	25	6	37
2:15-3:15	4	2	22	8	36	5	1	24	7	37
2:30-3:30	4	4	22	9	39	4	1	23	9	37
2:45-3:45	5	3	22	8	38	4	3	20	8	35
3:00-4:00	1	4	24	7	36	3	5	21	8	37
3:15-4:15	2	4	22	6	34	3	5	24	8	40
3:30-4:30	6	2	20	6	34	4	5	21	5	35
3:45-4:45	5	3	22	5	35	5	3	20	4	32
4:00-5:00	**5**	**2**	**18**	**5**	**30**	**5**	**4**	**20**	**5**	**34**
4:15-5:15	4	2	14	5	25	5	3	17	3	28
4:30-5:30	0	2	10	4	16	5	3	16	3	27
4:45-5:45	0	0	4	5	9	2	3	13	6	24
5:00-6:00	0	0	0	6	6	2	0	7	5	14

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	3	3	0	0	0	1	1
6:15-6:30	0	0	0	1	1	0	0	0	1	1
6:30-6:45	0	0	0	2	2	0	0	0	1	1
6:45-7:00	0	0	0	3	3	0	1	0	3	4
7:00-7:15	1	2	0	2	5	0	0	0	3	3
7:15-7:30	2	0	1	1	4	0	1	0	2	3
7:30-7:45	3	0	2	0	5	0	2	1	1	4
7:45-8:00	1	1	3	0	5	2	0	3	1	6
8:00-8:15	2	0	0	3	5	0	0	2	0	2
8:15-8:30	3	1	2	2	8	0	0	0	4	4
8:30-8:45	0	1	1	1	3	1	0	1	3	5
8:45-9:00	2	3	0	0	5	0	2	2	1	5
DWY 1	0	0	4	0		0	0	0	0	
DWY 2	0	0	0	0		0	1	1	0	
DWY 3	4	0	0	0		0	0	0	0	
9:00-9:15	4	0	4	0	8	0	1	1	0	2
9:15-9:30	2	1	3	1	7	1	2	3	0	6
9:30-9:45	4	2	0	3	9	2	1	2	2	7
9:45-10:00	2	3	2	1	8	0	4	1	0	5
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	0	0	0	9	9	0	1	0	6	7
6:15-7:15	1	2	0	8	11	0	1	0	8	9
6:30-7:30	3	2	1	8	14	0	2	0	9	11
6:45-7:45	6	2	3	6	17	0	4	1	9	14
7:00-8:00	7	3	6	3	19	2	3	4	7	16
7:15-8:15	8	1	6	4	19	2	3	6	4	15
7:30-8:30	9	2	7	5	23	2	2	6	6	16
7:45-8:45	6	3	6	6	21	3	0	6	8	17
8:00-9:00	7	5	3	6	21	1	2	5	8	16
8:15-9:15	9	5	7	3	24	1	3	4	8	16
8:30-9:30	8	5	8	2	23	2	5	7	4	18
8:45-9:45	12	6	7	4	29	3	6	8	3	20
9:00-10:00	12	6	9	5	**32**	3	8	7	2	**20**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	1	1	5	2	9	2	1	0	0	3
3:15-3:30	0	1	5	0	6	1	0	6	0	7
3:30-3:45	1	0	5	0	6	1	0	1	4	6
3:45-4:00	4	4	11	0	19	3	2	5	2	12
4:00-4:15	1	1	8	0	10	5	1	5	1	12
4:15-4:30	0	0	6	0	6	1	1	7	3	12
4:30-4:45	2	0	2	0	4	2	0	3	3	8
4:45-5:00	0	1	4	0	5	3	1	1	2	7
5:00-5:15	0	0	2	0	2	1	1	0	5	7
5:15-5:30	1	0	3	0	4	0	0	1	2	3
5:30-5:45	7	0	0	0	7	9	0	0	2	11
5:45-6:00	1	0	0	0	1	2	0	0	0	2
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	6	6	26	2	40	7	3	12	6	28
3:15-4:15	6	6	29	0	41	10	3	17	7	37
3:30-4:30	6	5	30	0	**41**	10	4	18	10	**42**
3:45-4:45	7	5	27	0	39	11	4	20	9	44
4:00-5:00	3	2	20	0	25	11	3	16	9	39
4:15-5:15	2	1	14	0	17	7	3	11	13	34
4:30-5:30	3	1	11	0	15	6	2	5	12	25
4:45-5:45	8	1	9	0	18	13	2	2	11	28
5:00-6:00	9	0	5	0	14	12	1	1	9	23

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	3	3	0	0	0	4	4
6:15-6:30	0	0	0	1	1	0	0	0	1	1
6:30-6:45	0	0	1	3	4	0	0	0	2	2
6:45-7:00	0	1	1	4	6	0	0	1	4	5
7:00-7:15	0	3	1	0	4	0	2	1	1	4
7:15-7:30	0	0	2	1	3	0	1	0	2	3
7:30-7:45	1	3	2	0	6	0	0	3	0	3
7:45-8:00	2	2	3	2	9	1	0	0	0	1
8:00-8:15	4	1	0	4	9	1	2	5	3	11
8:15-8:30	4	0	1	2	7	0	1	0	2	3
8:30-8:45	1	0	1	0	2	0	0	2	2	4
8:45-9:00	3	1	4	1	9	0	0	0	0	0
9:00-9:15	2	1	2	2	7	0	2	3	4	9
9:15-9:30	2	1	1	2	6	1	1	4	1	7
9:30-9:45	3	0	1	4	8	2	0	2	4	8
9:45-10:00	3	1	0	2	6	1	0	1	1	3
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	0	1	2	11	14	0	0	1	11	12
6:15-7:15	0	4	3	8	15	0	2	2	8	12
6:30-7:30	0	4	5	8	17	0	3	2	9	14
6:45-7:45	1	7	6	5	19	0	3	5	7	15
7:00-8:00	3	8	8	3	22	1	3	4	3	11
7:15-8:15	7	6	7	7	27	2	3	8	5	18
7:30-8:30	11	6	6	8	31	2	3	8	5	18
7:45-8:45	11	3	5	8	27	2	3	7	7	19
8:00-9:00	12	2	6	7	27	1	3	7	7	18
8:15-9:15	10	2	8	5	25	0	3	5	8	16
8:30-9:30	8	3	8	5	24	1	3	9	7	20
8:45-9:45	10	3	8	9	30	3	3	9	9	24
9:00-10:00	10	3	4	10	**27**	4	3	10	10	**27**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	0	7	0	9	1	1	1	1	4
3:15-3:30	1	1	2	2	6	0	1	0	3	4
3:30-3:45	3	1	6	0	10	2	0	3	1	6
3:45-4:00	1	0	6	0	7	2	1	3	0	6
4:00-4:15	2	1	3	0	6	4	0	1	3	8
4:15-4:30	1	0	1	0	2	2	0	0	1	3
4:30-4:45	0	0	3	0	3	0	0	0	3	3
4:45-5:00	1	3	3	0	7	2	0	0	1	3
5:00-5:15	1	0	2	0	3	1	2	1	1	5
5:15-5:30	0	0	3	0	3	0	0	1	3	4
5:30-5:45	2	1	8	0	11	7	0	2	4	13
5:45-6:00	0	1	4	0	5	0	0	3	1	4
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	7	2	21	2	32	5	3	7	5	20
3:15-4:15	7	3	17	2	**29**	8	2	7	7	**24**
3:30-4:30	7	2	16	0	25	10	1	7	5	23
3:45-4:45	4	1	13	0	18	8	1	4	7	20
4:00-5:00	4	4	10	0	18	8	0	1	8	17
4:15-5:15	3	3	9	0	15	5	2	1	6	14
4:30-5:30	2	3	11	0	16	3	2	2	8	15
4:45-5:45	4	4	16	0	24	10	2	4	9	25
5:00-6:00	3	2	17	0	22	8	2	7	9	26

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	2	2	0	0	0	1	1
6:15-6:30	0	1	0	0	1	0	0	0	2	2
6:30-6:45	0	1	0	3	4	0	0	0	1	1
6:45-7:00	1	1	2	4	8	0	0	2	3	5
7:00-7:15	0	0	0	1	1	0	1	1	1	3
7:15-7:30	0	0	3	2	5	0	1	2	2	5
7:30-7:45	1	2	0	0	3	0	0	2	0	2
7:45-8:00	1	0	2	1	4	0	1	1	1	3
8:00-8:15	0	1	1	2	4	1	1	1	0	3
8:15-8:30	4	0	1	2	7	0	1	2	2	5
8:30-8:45	2	0	2	2	6	2	0	1	3	6
8:45-9:00	3	0	3	0	6	1	0	1	2	4
9:00-9:15	3	1	1	1	6	1	0	2	2	5
9:15-9:30	2	0	4	3	9	4	1	2	2	9
9:30-9:45	0	0	2	0	2	0	0	4	0	4
9:45-10:00	2	0	4	1	7	0	0	4	1	5
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	1	3	2	9	15	0	0	2	7	9
6:15-7:15	1	3	2	8	14	0	1	3	7	11
6:30-7:30	1	2	5	10	18	0	2	5	7	14
6:45-7:45	2	3	5	7	17	0	2	7	6	15
7:00-8:00	2	2	5	4	13	0	3	6	4	13
7:15-8:15	2	3	6	5	16	1	3	6	3	13
7:30-8:30	6	3	4	5	18	1	3	6	3	13
7:45-8:45	7	1	6	7	21	3	3	5	6	17
8:00-9:00	9	1	7	6	23	4	2	5	7	18
8:15-9:15	12	1	7	5	25	4	1	6	9	20
8:30-9:30	10	1	10	6	**27**	8	1	6	9	**24**
8:45-9:45	8	1	10	4	23	6	1	9	6	22
9:00-10:00	7	1	11	5	24	5	1	12	5	23

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	0	1	9	0	10	2	1	8	0	11
3:15-3:30	1	0	12	0	13	0	3	4	0	7
3:30-3:45	0	0	7	0	7	0	0	9	0	9
3:45-4:00	1	0	2	1	4	2	0	7	1	10
4:00-4:15	1	0	0	0	1	2	0	4	1	7
4:15-4:30	0	0	3	0	3	2	0	4	1	7
4:30-4:45	0	0	5	0	5	4	0	0	0	4
4:45-5:00	1	0	2	0	3	5	0	2	2	9
5:00-5:15	0	0	0	0	0	2	0	2	1	5
5:15-5:30	0	0	7	0	7	1	0	4	0	5
5:30-5:45	0	1	2	0	3	1	0	5	0	6
5:45-6:00	0	0	0	0	0	1	1	2	0	4
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	2	1	30	1	**34**	4	4	28	1	**37**
3:15-4:15	3	0	21	1	25	4	3	24	2	33
3:30-4:30	2	0	12	1	15	6	0	24	3	33
3:45-4:45	2	0	10	1	13	10	0	15	3	28
4:00-5:00	2	0	10	0	12	13	0	10	4	27
4:15-5:15	1	0	10	0	11	13	0	8	4	25
4:30-5:30	1	0	14	0	15	12	0	8	3	23
4:45-5:45	1	1	11	0	13	9	0	13	3	25
5:00-6:00	0	1	9	0	10	5	1	13	1	20

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM - 6:30 PM - Business Day)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	2	2	0	0	0	1	1
6:15-6:30	0	1	0	0	1	0	0	0	2	2
6:30-6:45	0	1	0	3	4	0	0	0	1	1
6:45-7:00	1	1	2	4	8	0	0	2	3	5
7:00-7:15	0	0	0	1	1	0	1	1	1	3
7:15-7:30	0	0	3	2	5	0	1	2	2	5
7:30-7:45	1	2	0	0	3	0	0	2	0	2
7:45-8:00	1	0	2	1	4	0	1	1	1	3
8:00-8:15	0	1	1	2	4	1	1	1	0	3
8:15-8:30	4	0	1	2	7	0	1	2	2	5
8:30-8:45	2	0	2	2	6	2	0	1	3	6
8:45-9:00	3	0	3	0	6	1	0	1	2	4
9:00-9:15	3	1	1	1	6	1	0	2	2	5
9:15-9:30	2	0	4	3	9	4	1	2	2	9
9:30-9:45	0	0	2	0	2	0	0	4	0	4
9:45-10:00	2	0	4	1	7	0	0	4	1	5
10:00-10:15	1	0	3	1	5	0	0	4	1	5
10:15-10:30	1	0	2	1	4	2	0	0	1	3
10:30-10:45	1	0	6	2	9	1	0	0	1	2
10:45-11:00	1	0	5	1	7	0	1	10	2	13
11:00-11:15	1	2	5	2	10	1	0	6	2	9
11:15-11:30	2	0	2	2	6	2	0	5	1	8
11:30-11:45	4	0	5	1	10	1	0	2	3	6
11:45-12:00	2	0	4	2	8	0	0	3	3	6
12:00-12:15	0	0	2	2	4	3	0	4	3	10
12:15-12:30	2	0	1	2	5	0	0	5	1	6
12:30-12:45	0	0	2	2	4	0	0	0	1	1
12:45-1:00	2	0	5	0	7	2	0	3	1	6
1:00-1:15	1	0	0	3	4	0	0	4	1	5
1:15-1:30	2	0	3	1	6	1	0	1	0	2
1:30-1:45	1	0	1	3	5	2	1	3	1	7
1:45-2:00	4	1	5	1	11	2	0	2	0	4
2:00-2:15	1	0	3	2	6	3	0	3	1	7
2:15-2:30	1	0	2	1	4	0	0	5	2	7
2:30-2:45	0	0	8	1	9	1	0	3	2	6
2:45-3:00	2	0	4	2	8	0	0	3	1	4
3:00-3:15	0	1	9	0	10	2	1	8	0	11
3:15-3:30	1	0	12	0	13	0	3	4	0	7
3:30-3:45	0	0	7	0	7	0	0	9	0	9
3:45-4:00	1	0	2	1	4	2	0	7	1	10
4:00-4:15	1	0	0	0	1	2	0	4	1	7
4:15-4:30	0	0	3	0	3	2	0	4	1	7
4:30-4:45	0	0	5	0	5	4	0	0	0	4
4:45-5:00	1	0	2	0	3	5	0	2	2	9
5:00-5:15	0	0	0	0	0	2	0	2	1	5
5:15-5:30	0	0	7	0	7	1	0	4	0	5
5:30-5:45	0	1	2	0	3	1	0	5	0	6
5:45-6:00	0	0	0	0	0	1	1	2	0	4
6:00-6:15	0	0	0	0	0	0	0	0	0	0
6:15-6:30	0	0	0	0	0	1	0	0	1	2
TOTALS	52	12	142	57	263	53	13	142	58	266

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM - 6:30 PM - Business Day)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	1	3	2	9	15	0	0	2	7	9
6:15-7:15	1	3	2	8	14	0	1	3	7	11
6:30-7:30	1	2	5	10	18	0	2	5	7	14
6:45-7:45	2	3	5	7	17	0	2	7	6	15
7:00-8:00	2	2	5	4	13	0	3	6	4	13
7:15-8:15	2	3	6	5	16	1	3	6	3	13
7:30-8:30	6	3	4	5	18	1	3	6	3	13
7:45-8:45	7	1	6	7	21	3	3	5	6	17
8:00-9:00	**9**	**1**	**7**	**6**	**23**	**4**	**2**	**5**	**7**	**18**
8:15-9:15	12	1	7	5	25	4	1	6	9	20
8:30-9:30	10	1	10	6	27	8	1	6	9	24
8:45-9:45	8	1	10	4	23	6	1	9	6	22
9:00-10:00	7	1	11	5	24	5	1	12	5	23
9:15-10:15	5	0	13	5	23	4	1	14	4	23
9:30-10:30	4	0	11	3	18	2	0	12	3	17
9:45-10:45	5	0	15	5	25	3	0	8	4	15
10:00-11:00	4	0	16	5	25	3	1	14	5	23
10:15-11:15	4	2	18	6	30	4	1	16	6	27
10:30-11:30	5	2	18	7	32	4	1	21	6	32
10:45-11:45	8	2	17	6	33	4	1	23	8	36
11:00-12:00	9	2	16	7	34	4	0	16	9	29
11:15-12:15	8	0	13	7	28	6	0	14	10	30
11:30-12:30	8	0	12	7	27	4	0	14	10	28
11:45-12:45	4	0	9	8	21	3	0	12	8	23
12:00-1:00	4	0	10	6	20	5	0	12	6	23
12:15-1:15	5	0	8	7	20	2	0	12	4	18
12:30-1:30	5	0	10	6	21	3	0	8	3	14
12:45-1:45	6	0	9	7	22	5	1	11	3	20
1:00-2:00	8	1	9	8	26	5	1	10	2	18
1:15-2:15	8	1	12	7	28	8	1	9	2	20
1:30-2:30	7	1	11	7	26	7	1	13	4	25
1:45-2:45	6	1	18	5	30	6	0	13	5	24
2:00-3:00	4	0	17	6	27	4	0	14	6	24
2:15-3:15	3	1	23	4	31	3	1	19	5	28
2:30-3:30	3	1	33	3	40	3	4	18	3	28
2:45-3:45	3	1	32	2	38	2	4	24	1	31
3:00-4:00	**2**	**1**	**30**	**1**	**34**	**4**	**4**	**28**	**1**	**37**
3:15-4:15	3	0	21	1	25	4	3	24	2	33
3:30-4:30	2	0	12	1	15	6	0	24	3	33
3:45-4:45	2	0	10	1	13	10	0	15	3	28
4:00-5:00	**2**	**0**	**10**	**0**	**12**	**13**	**0**	**10**	**4**	**27**
4:15-5:15	1	0	10	0	11	13	0	8	4	25
4:30-5:30	1	0	14	0	15	12	0	8	3	23
4:45-5:45	1	1	11	0	13	9	0	13	3	25
5:00-6:00	0	1	9	0	10	5	1	13	1	20
6:00-6:15	0	1	9	0	10	3	1	11	0	15
6:15-6:30	0	1	2	0	3	3	1	7	1	12

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	1	0	1	2	3	0	21	3	27
6:15-6:30	2	0	0	0	2	0	1	12	2	15
6:30-6:45	0	0	5	5	10	0	0	3	2	5
6:45-7:00	2	1	7	2	12	0	3	9	4	16
7:00-7:15	1	0	2	2	5	1	2	5	4	12
7:15-7:30	3	0	1	0	4	0	0	0	3	3
7:30-7:45	4	2	3	2	11	3	1	1	1	6
7:45-8:00	6	2	11	3	22	2	2	4	1	9
8:00-8:15	5	3	5	2	15	1	6	6	1	14
8:15-8:30	7	2	5	1	15	5	2	9	1	17
8:30-8:45	2	2	6	3	13	2	1	3	3	9
8:45-9:00	2	1	7	5	15	3	2	3	0	8
9:00-9:15	2	1	5	5	13	3	0	5	2	10
9:15-9:30	3	1	11	1	16	1	1	5	0	7
9:30-9:45	2	3	7	2	14	2	4	2	3	11
9:45-10:00	2	0	5	4	11	1	1	9	3	14
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	4	2	12	8	26	3	4	45	11	63
6:15-7:15	5	1	14	9	29	1	6	29	12	48
6:30-7:30	6	1	15	9	31	1	5	17	13	36
6:45-7:45	10	3	13	6	32	4	6	15	12	37
7:00-8:00	14	4	17	7	42	6	5	10	9	30
7:15-8:15	18	7	20	7	52	6	9	11	6	32
7:30-8:30	22	9	24	8	63	11	11	20	4	46
7:45-8:45	20	9	27	9	**65**	10	11	22	6	**49**
8:00-9:00	16	8	23	11	58	11	11	21	5	48
8:15-9:15	13	6	23	14	56	13	5	20	6	44
8:30-9:30	9	5	29	14	57	9	4	16	5	34
8:45-9:45	9	6	30	13	58	9	7	15	5	36
9:00-10:00	9	5	28	12	54	7	6	21	8	42

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	0	0	2	4	6	0	1	0	7
3:15-3:30	5	4	5	1	15	3	0	1	0	4
3:30-3:45	4	3	5	5	17	6	1	1	1	9
3:45-4:00	7	0	1	2	10	5	0	1	1	7
4:00-4:15	3	1	3	0	7	9	1	1	0	11
4:15-4:30	4	0	0	1	5	5	0	0	0	5
4:30-4:45	1	2	0	0	3	4	2	0	0	6
4:45-5:00	1	0	1	0	2	3	0	1	0	4
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	18	7	11	10	46	20	1	4	2	27
3:15-4:15	19	8	14	8	**49**	23	2	4	2	**31**
3:30-4:30	18	4	9	8	39	25	2	3	2	32
3:45-4:45	15	3	4	3	25	23	3	2	1	29
4:00-5:00	9	3	4	1	17	21	3	2	0	26

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	1	1	0	1	3	1	5
6:15-6:30	5	1	1	4	11	1	0	6	0	7
6:30-6:45	7	0	6	4	17	1	0	2	0	3
6:45-7:00	6	2	5	3	16	1	0	6	0	7
7:00-7:15	10	3	5	1	19	0	2	5	0	7
7:15-7:30	8	3	1	0	12	1	1	4	0	6
7:30-7:45	6	3	5	0	14	0	4	1	0	5
7:45-8:00	20	0	7	7	34	0	4	5	2	11
8:00-8:15	9	0	3	5	17	1	5	5	2	13
8:15-8:30	15	4	10	4	33	2	5	3	0	10
8:30-8:45	13	5	5	3	26	1	1	5	1	8
8:45-9:00	19	3	8	4	34	0	3	4	0	7
9:00-9:15	25	3	6	2	36	0	5	5	1	11
9:15-9:30	30	4	6	8	48	0	0	8	1	9
9:30-9:45	19	3	5	3	30	0	1	4	1	6
9:45-10:00	17	1	3	5	26	0	2	2	3	7
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	18	3	12	12	45	3	1	17	1	22
6:15-7:15	28	6	17	12	63	3	2	19	0	24
6:30-7:30	31	8	17	8	64	3	3	17	0	23
6:45-7:45	30	11	16	4	61	2	7	16	0	25
7:00-8:00	44	9	18	8	79	1	11	15	2	29
7:15-8:15	43	6	16	12	77	2	14	15	4	35
7:30-8:30	50	7	25	16	98	3	18	14	4	39
7:45-8:45	57	9	25	19	110	4	15	18	5	42
8:00-9:00	56	12	26	16	110	4	14	17	3	38
8:15-9:15	72	15	29	13	129	3	14	17	2	36
8:30-9:30	87	15	25	17	144	1	9	22	3	35
8:45-9:45	93	13	25	17	**148**	0	9	21	3	**33**
9:00-10:00	91	11	20	18	140	0	8	19	6	33

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	1	1	2	6	12	1	2	1	16
3:15-3:30	2	2	1	0	5	11	1	2	1	15
3:30-3:45	1	1	1	1	4	16	0	1	0	17
3:45-4:00	0	1	1	0	2	3	1	0	0	4
4:00-4:15	0	1	0	3	4	7	0	2	0	9
4:15-4:30	2	2	1	0	5	3	0	3	0	6
4:30-4:45	1	1	0	0	2	5	0	0	0	5
4:45-5:00	2	0	0	0	2	3	0	0	0	3
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	5	5	4	3	**17**	42	3	5	2	**52**
3:15-4:15	3	5	3	4	15	37	2	5	1	45
3:30-4:30	3	5	3	4	15	29	1	6	0	36
3:45-4:45	3	5	2	3	13	18	1	5	0	24
4:00-5:00	5	4	1	3	13	18	0	5	0	23

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	2	2	1	4	16	5	26
6:15-6:30	5	2	0	3	10	0	0	8	4	12
6:30-6:45	1	0	2	4	7	0	1	5	3	9
6:45-7:00	5	0	6	2	13	0	1	1	6	8
7:00-7:15	3	0	1	1	5	1	1	5	3	10
7:15-7:30	3	0	3	0	6	0	0	2	2	4
7:30-7:45	6	4	5	1	16	1	2	1	0	4
7:45-8:00	10	3	2	4	19	4	1	0	1	6
8:00-8:15	8	0	7	6	21	4	1	3	3	11
8:15-8:30	9	1	4	5	19	3	1	7	0	11
8:30-8:45	6	1	9	5	21	5	1	5	1	12
8:45-9:00	2	2	5	6	15	1	2	0	1	4
9:00-9:15	3	1	4	3	11	5	0	2	2	9
9:15-9:30	2	2	5	6	15	10	2	5	4	21
9:30-9:45	5	1	8	16	30	2	3	7	6	18
9:45-10:00	1	3	6	11	21	4	4	5	6	19
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	11	2	8	11	32	1	6	30	18	55
6:15-7:15	14	2	9	10	35	1	3	19	16	39
6:30-7:30	12	0	12	7	31	1	3	13	14	31
6:45-7:45	17	4	15	4	40	2	4	9	11	26
7:00-8:00	22	7	11	6	46	6	4	8	6	24
7:15-8:15	27	7	17	11	62	9	4	6	6	25
7:30-8:30	33	8	18	16	75	12	5	11	4	32
7:45-8:45	33	5	22	20	80	16	4	15	5	40
8:00-9:00	25	4	25	22	76	13	5	15	5	38
8:15-9:15	20	5	22	19	66	14	4	14	4	36
8:30-9:30	13	6	23	20	62	21	5	12	8	46
8:45-9:45	12	6	22	31	71	18	7	14	13	52
9:00-10:00	11	7	23	36	**77**	21	9	19	18	**67**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	1	1	4	0	6	3	0	0	0	3
3:15-3:30	2	1	4	4	11	3	2	0	0	5
3:30-3:45	2	4	2	3	11	3	2	3	1	9
3:45-4:00	7	1	2	2	12	6	3	1	0	10
4:00-4:15	5	1	1	2	9	8	2	0	1	11
4:15-4:30	3	0	2	1	6	3	0	2	1	6
4:30-4:45	0	0	0	0	0	11	0	0	0	11
4:45-5:00	2	0	2	0	4	5	0	0	0	5
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	12	7	12	9	40	15	7	4	1	27
3:15-4:15	16	7	9	11	**43**	20	9	4	2	**35**
3:30-4:30	17	6	7	8	38	20	7	6	3	36
3:45-4:45	15	2	5	5	27	28	5	3	2	38
4:00-5:00	10	1	5	3	19	27	2	2	2	33

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM - 5:00 PM - Business Day)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	2	2	1	4	16	5	26
6:15-6:30	5	2	0	3	10	0	0	8	4	12
6:30-6:45	1	0	2	4	7	0	1	5	3	9
6:45-7:00	5	0	6	2	13	0	1	1	6	8
7:00-7:15	3	0	1	1	5	1	1	5	3	10
7:15-7:30	3	0	3	0	6	0	0	2	2	4
7:30-7:45	6	4	5	1	16	1	2	1	0	4
7:45-8:00	10	3	2	4	19	4	1	0	1	6
8:00-8:15	8	0	7	6	21	4	1	3	3	11
8:15-8:30	9	1	4	5	19	3	1	7	0	11
8:30-8:45	6	1	9	5	21	5	1	5	1	12
8:45-9:00	2	2	5	6	15	1	2	0	1	4
9:00-9:15	3	1	4	3	11	5	0	2	2	9
9:15-9:30	2	2	5	6	15	10	2	5	4	21
9:30-9:45	5	1	8	16	30	2	3	7	6	18
9:45-10:00	1	3	6	11	21	4	4	5	6	19
10:00-10:15	5	0	7	3	15	3	1	8	11	23
10:15-10:30	1	2	7	3	13	4	4	9	3	20
10:30-10:45	6	1	4	10	21	5	1	6	3	15
10:45-11:00	4	3	3	4	14	3	1	4	3	11
11:00-11:15	3	1	4	6	14	4	0	5	4	13
11:15-11:30	3	0	8	7	18	2	0	5	1	8
11:30-11:45	8	3	8	5	24	5	1	7	4	17
11:45-12:00	5	2	8	4	19	5	1	8	1	15
12:00-12:15	5	2	6	4	17	3	5	6	3	17
12:15-12:30	2	1	2	5	10	5	1	1	3	10
12:30-12:45	8	6	6	5	25	4	1	1	2	8
12:45-1:00	5	0	9	6	20	6	0	5	3	14
1:00-1:15	9	5	5	6	25	7	3	4	1	15
1:15-1:30	5	5	5	6	21	5	4	2	1	12
1:30-1:45	3	1	5	5	14	3	2	1	4	10
1:45-2:00	7	7	10	5	29	5	2	1	0	8
2:00-2:15	2	2	2	7	13	6	4	1	0	11
2:15-2:30	3	0	3	2	8	6	1	1	0	8
2:30-2:45	3	1	2	1	7	14	1	0	1	16
2:45-3:00	9	0	2	1	12	10	2	2	0	14
3:00-3:15	1	1	4	0	6	3	0	0	0	3
3:15-3:30	2	1	4	4	11	3	2	0	0	5
3:30-3:45	2	4	2	3	11	3	2	3	1	9
3:45-4:00	7	1	2	2	12	6	3	1	0	10
4:00-4:15	5	1	1	2	9	8	2	0	1	11
4:15-4:30	3	0	3	1	7	3	0	2	1	6
4:30-4:45	0	0	0	0	0	11	0	0	0	11
4:45-5:00	2	0	4	0	6	5	0	0	0	5
TOTALS	187	70	193	182	632	188	68	155	98	509

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM - 5:00 PM - Business Day)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	11	2	8	11	32	1	6	30	18	55
6:15-7:15	14	2	9	10	35	1	3	19	16	39
6:30-7:30	12	0	12	7	31	1	3	13	14	31
6:45-7:45	17	4	15	4	40	2	4	9	11	26
7:00-8:00	22	7	11	6	46	6	4	8	6	24
7:15-8:15	27	7	17	11	62	9	4	6	6	25
7:30-8:30	33	8	18	16	75	12	5	11	4	32
7:45-8:45	**33**	**5**	**22**	**20**	**80**	**16**	**4**	**15**	**5**	**40**
8:00-9:00	25	4	25	22	76	13	5	15	5	38
8:15-9:15	20	5	22	19	66	14	4	14	4	36
8:30-9:30	13	6	23	20	62	21	5	12	8	46
8:45-9:45	12	6	22	31	71	18	7	14	13	52
9:00-10:00	11	7	23	36	77	21	9	19	18	67
9:15-10:15	**13**	**6**	**26**	**36**	**81**	**19**	**10**	**25**	**27**	**81**
9:30-10:30	12	6	28	33	79	13	12	29	26	80
9:45-10:45	13	6	24	27	70	16	10	28	23	77
10:00-11:00	16	6	21	20	63	15	7	27	20	69
10:15-11:15	14	7	18	23	62	16	6	24	13	59
10:30-11:30	16	5	19	27	67	14	2	20	11	47
10:45-11:45	18	7	23	22	70	14	2	21	12	49
11:00-12:00	19	6	28	22	75	16	2	25	10	53
11:15-12:15	21	7	30	20	78	15	7	26	9	57
11:30-12:30	20	8	24	18	70	18	8	22	11	59
11:45-12:45	20	11	22	18	71	17	8	16	9	50
12:00-1:00	20	9	23	20	72	18	7	13	11	49
12:15-1:15	24	12	22	22	80	22	5	11	9	47
12:30-1:30	27	16	25	23	91	22	8	12	7	49
12:45-1:45	22	11	24	23	80	21	9	12	9	51
1:00-2:00	24	18	25	22	89	20	11	8	6	45
1:15-2:15	17	15	22	23	77	19	12	5	5	41
1:30-2:30	15	10	20	19	64	20	9	4	4	37
1:45-2:45	15	10	17	15	57	31	8	3	1	43
2:00-3:00	17	3	9	11	40	36	8	4	1	49
2:15-3:15	16	2	11	4	33	33	4	3	1	41
2:30-3:30	15	3	12	6	36	30	5	2	1	38
2:45-3:45	14	6	12	8	40	19	6	5	1	31
3:00-4:00	12	7	12	9	40	15	7	4	1	27
3:15-4:15	**16**	**7**	**9**	**11**	**43**	**20**	**9**	**4**	**2**	**35**
3:30-4:30	17	6	8	8	39	20	7	6	3	36
3:45-4:45	15	2	6	5	28	28	5	3	2	38
4:00-5:00	10	1	8	3	22	27	2	2	2	33

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	1	0	1	1	0	0	0	1
6:15-6:30	0	1	3	0	4	0	0	2	2	4
6:30-6:45	2	3	1	0	6	1	0	2	2	5
6:45-7:00	2	0	0	0	2	1	2	1	2	6
7:00-7:15	1	1	0	0	2	4	0	0	2	6
7:15-7:30	1	0	0	0	1	0	1	1	4	6
7:30-7:45	2	0	0	0	2	1	0	1	0	2
7:45-8:00	0	0	0	0	0	1	1	6	1	9
8:00-8:15	3	0	0	0	3	0	0	1	0	1
8:15-8:30	3	0	0	0	3	3	0	3	0	6
8:30-8:45	2	1	0	0	3	4	0	2	2	8
8:45-9:00	2	3	0	1	6	0	0	3	3	6
9:00-9:15	1	2	1	0	4	3	2	3	3	11
9:15-9:30	3	0	6	0	9	3	2	2	1	8
9:30-9:45	2	0	6	0	8	1	1	5	2	9
9:45-10:00	1	2	2	0	5	1	0	6	4	11
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	4	4	5	0	13	3	2	5	6	16
6:15-7:15	5	5	4	0	14	6	2	5	8	21
6:30-7:30	6	4	1	0	11	6	3	4	10	23
6:45-7:45	6	1	0	0	7	6	3	3	8	20
7:00-8:00	4	1	0	0	5	6	2	8	7	23
7:15-8:15	6	0	0	0	6	2	2	9	5	18
7:30-8:30	8	0	0	0	8	5	1	11	1	18
7:45-8:45	8	1	0	0	9	8	1	12	3	24
8:00-9:00	10	4	0	1	15	7	0	9	5	21
8:15-9:15	8	6	1	1	16	10	2	11	8	31
8:30-9:30	8	6	7	1	22	10	4	10	9	33
8:45-9:45	8	5	13	1	27	7	5	13	9	34
9:00-10:00	7	4	15	0	**26**	8	5	16	10	**39**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	0	2	6	0	8	5	0	6	2	13
3:15-3:30	3	1	8	0	12	3	1	7	2	13
3:30-3:45	1	4	11	0	16	3	4	8	2	17
3:45-4:00	2	2	2	0	6	2	1	9	2	14
4:00-4:15	2	2	5	0	9	1	4	3	3	11
4:15-4:30	5	1	11	0	17	2	1	5	1	9
4:30-4:45	1	1	11	0	13	5	1	6	0	12
4:45-5:00	3	1	14	0	18	2	0	12	0	14
5:00-5:15	0	0	7	0	7	3	1	14	0	18
5:15-5:30	0	1	16	0	17	1	0	7	0	8
5:30-5:45	0	0	16	0	16	0	0	15	0	15
5:45-6:00	1	0	10	0	11	1	0	12	0	13
6:00-6:15	0	0	3	0	3	0	1	8	0	9
6:15-6:30	0	0	1	0	1	1	0	7	0	8
6:30-6:45	0	0	1	0	1	0	0	1	0	1
6:45-7:00	0	0	0	0	0	0	0	0	0	0
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	6	9	27	0	42	13	6	30	8	57
3:15-4:15	8	9	26	0	43	9	10	27	9	55
3:30-4:30	10	9	29	0	48	8	10	25	8	51
3:45-4:45	10	6	29	0	45	10	7	23	6	46
4:00-5:00	11	5	41	0	57	10	6	26	4	46
4:15-5:15	9	3	43	0	55	12	3	37	1	53
4:30-5:30	4	3	48	0	55	11	2	39	0	52
4:45-5:45	3	2	53	0	**58**	6	1	48	0	**55**
5:00-6:00	1	1	49	0	51	5	1	48	0	54
5:15-6:15	1	1	45	0	47	2	1	42	0	45
5:30-6:30	1	0	30	0	31	2	1	42	0	45
5:45-6:45	1	0	15	0	16	2	1	28	0	31
6:00-7:00	0	0	5	0	5	1	1	16	0	18

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	1	2	1	0	4	0	2	1	2	5
6:15-6:30	0	0	3	0	3	1	3	8	4	16
6:30-6:45	1	0	1	0	2	1	1	7	4	13
6:45-7:00	0	0	1	0	1	0	0	6	7	13
7:00-7:15	0	3	1	0	4	1	1	7	5	14
7:15-7:30	3	0	2	0	5	1	2	3	3	9
7:30-7:45	1	1	4	0	6	0	1	4	3	8
7:45-8:00	2	0	1	0	3	2	1	8	3	14
8:00-8:15	3	0	7	0	10	2	0	3	5	10
8:15-8:30	4	1	1	0	6	3	2	3	5	13
8:30-8:45	2	0	5	1	8	6	1	4	5	16
8:45-9:00	2	0	3	0	5	2	0	3	7	12
9:00-9:15	4	1	1	0	6	3	0	4	6	13
9:15-9:30	3	2	6	0	11	3	0	3	3	9
9:30-9:45	2	0	6	0	8	2	4	8	2	16
9:45-10:00	4	2	2	0	8	3	2	7	1	13
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	2	2	6	0	10	2	6	22	17	47
6:15-7:15	1	3	6	0	10	3	5	28	20	56
6:30-7:30	4	3	5	0	12	3	4	23	19	49
6:45-7:45	4	4	8	0	16	2	4	20	18	44
7:00-8:00	6	4	8	0	18	4	5	22	14	45
7:15-8:15	9	1	14	0	24	5	4	18	14	41
7:30-8:30	10	2	13	0	25	7	4	18	16	45
7:45-8:45	11	1	14	1	27	13	4	18	18	53
8:00-9:00	11	1	16	1	29	13	3	13	22	51
8:15-9:15	12	2	10	1	25	14	3	14	23	54
8:30-9:30	11	3	15	1	30	14	1	14	21	50
8:45-9:45	11	3	16	0	30	10	4	18	18	50
9:00-10:00	13	5	15	0	**33**	11	6	22	12	**51**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	5	2	8	0	15	4	0	4	2	10
3:15-3:30	2	1	7	0	10	4	3	7	3	17
3:30-3:45	3	2	11	0	16	2	0	4	2	8
3:45-4:00	1	2	13	0	16	4	1	14	3	22
4:00-4:15	4	3	17	0	24	4	1	9	3	17
4:15-4:30	5	0	18	0	23	2	0	11	2	15
4:30-4:45	1	2	11	0	14	3	1	12	1	17
4:45-5:00	1	2	17	0	20	3	1	5	0	9
5:00-5:15	0	0	18	0	18	1	0	13	0	14
5:15-5:30	0	0	9	0	9	3	0	8	0	11
5:30-5:45	1	0	13	0	14	0	0	17	0	17
5:45-6:00	2	0	10	0	12	0	0	9	0	9
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	11	7	39	0	57	14	4	29	10	57
3:15-4:15	10	8	48	0	66	14	5	34	11	64
3:30-4:30	13	7	59	0	79	12	2	38	10	62
3:45-4:45	11	7	59	0	**77**	13	3	46	9	**71**
4:00-5:00	11	7	63	0	81	12	3	37	6	58
4:15-5:15	7	4	64	0	75	9	2	41	3	55
4:30-5:30	2	4	55	0	61	10	2	38	1	51
4:45-5:45	2	2	57	0	61	7	1	43	0	51
5:00-6:00	3	0	50	0	53	4	0	47	0	51

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	5	0	1	0	6	2	1	3	2	8
6:15-6:30	3	0	0	0	3	2	1	10	3	16
6:30-6:45	1	0	4	0	5	4	0	2	5	11
6:45-7:00	4	0	1	0	5	3	1	12	3	19
7:00-7:15	1	0	4	0	5	2	1	9	5	17
7:15-7:30	2	0	2	0	4	3	1	5	3	12
7:30-7:45	1	0	2	1	4	2	0	4	0	6
7:45-8:00	4	0	2	1	7	2	0	1	1	4
8:00-8:15	2	1	2	0	5	4	0	2	3	9
8:15-8:30	2	0	4	0	6	2	1	5	5	13
8:30-8:45	0	0	2	1	3	2	0	5	5	12
8:45-9:00	1	0	2	0	3	2	1	2	5	10
9:00-9:15	2	0	0	0	2	1	0	4	3	8
9:15-9:30	3	1	3	0	7	3	0	0	2	5
9:30-9:45	3	0	1	0	4	0	0	4	6	10
9:45-10:00	1	0	7	0	8	1	2	4	5	12
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	13	0	6	0	19	11	3	27	13	54
6:15-7:15	9	0	9	0	**18**	11	3	33	16	**63**
6:30-7:30	8	0	11	0	19	12	3	28	16	59
6:45-7:45	8	0	9	1	18	10	3	30	11	54
7:00-8:00	8	0	10	2	20	9	2	19	9	39
7:15-8:15	9	1	8	2	20	11	1	12	7	31
7:30-8:30	9	1	10	2	22	10	1	12	9	32
7:45-8:45	8	1	10	2	21	10	1	13	14	38
8:00-9:00	5	1	10	1	17	10	2	14	18	44
8:15-9:15	5	0	8	1	14	7	2	16	18	43
8:30-9:30	6	1	7	1	15	8	1	11	15	35
8:45-9:45	9	1	6	0	16	6	1	10	16	33
9:00-10:00	9	1	11	0	21	5	2	12	16	35

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	4	7	0	13	3	2	6	4	15
3:15-3:30	0	2	7	0	9	1	1	5	3	10
3:30-3:45	3	3	14	0	20	2	1	8	4	15
3:45-4:00	2	1	14	0	17	1	3	13	2	19
4:00-4:15	3	3	16	0	22	1	0	8	1	10
4:15-4:30	2	2	14	0	18	1	3	12	0	16
4:30-4:45	0	1	16	0	17	2	1	10	0	13
4:45-5:00	5	0	17	0	22	0	0	8	0	8
5:00-5:15	2	1	11	0	14	4	0	12	0	16
5:15-5:30	2	0	11	0	13	4	0	12	0	16
5:30-5:45	0	0	9	0	9	2	0	5	0	7
5:45-6:00	3	1	9	0	13	1	0	10	0	11
6:00-6:15	1	0	11	0	12	2	1	10	0	13
6:15-6:30	1	1	3	0	5	1	1	4	0	6
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	7	10	42	0	59	7	7	32	13	59
3:15-4:15	8	9	51	0	68	5	5	34	10	54
3:30-4:30	10	9	58	0	**77**	5	7	41	7	**60**
3:45-4:45	7	7	60	0	74	5	7	43	3	58
4:00-5:00	10	6	63	0	79	4	4	38	1	47
4:15-5:15	9	4	58	0	71	7	4	42	0	53
4:30-5:30	9	2	55	0	66	10	1	42	0	53
4:45-5:45	9	1	48	0	58	10	0	37	0	47
5:00-6:00	7	2	40	0	49	11	0	39	0	50
5:15-6:15	6	1	40	0	47	9	1	37	0	47
5:30-6:30	5	2	32	0	39	6	2	29	0	37

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM -6:15 PM - Business Day)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	5	0	1	0	6	2	1	3	2	8
6:15-6:30	3	0	0	0	3	2	1	10	3	16
6:30-6:45	1	0	4	0	5	4	0	2	5	11
6:45-7:00	4	0	1	0	5	3	1	12	3	19
7:00-7:15	1	0	4	0	5	2	1	9	5	17
7:15-7:30	2	0	2	0	4	3	1	5	3	12
7:30-7:45	1	0	2	1	4	2	0	4	0	6
7:45-8:00	4	0	2	1	7	2	0	1	1	4
8:00-8:15	2	1	2	0	5	4	0	2	3	9
8:15-8:30	2	0	4	0	6	2	1	5	5	13
8:30-8:45	0	0	2	1	3	2	0	5	5	12
8:45-9:00	1	0	2	0	3	2	1	2	5	10
9:00-9:15	2	0	0	0	2	1	0	4	3	8
9:15-9:30	3	1	3	0	7	3	0	0	2	5
9:30-9:45	3	0	1	0	4	0	0	4	6	10
9:45-10:00	1	0	7	0	8	1	2	4	5	12
10:00-10:15	4	0	8	0	12	2	0	6	2	10
10:15-10:30	4	0	10	0	14	1	0	9	4	14
10:30-10:45	1	1	6	0	8	4	1	8	3	16
10:45-11:00	1	2	6	1	10	1	1	10	4	16
11:00-11:15	5	0	7	0	12	2	1	6	4	13
11:15-11:30	2	0	6	0	8	2	0	8	2	12
11:30-11:45	0	0	5	0	5	4	1	7	3	15
11:45-12:00	5	0	7	0	12	2	0	7	4	13
12:00-12:15	5	0	8	0	13	3	1	3	2	9
12:15-12:30	2	1	13	0	16	7	1	10	1	19
12:30-12:45	4	3	4	0	11	2	1	13	2	18
12:45-1:00	3	1	7	2	13	4	1	6	4	15
1:00-1:15	5	2	4	1	12	3	2	6	2	13
1:15-1:30	2	1	4	0	7	4	1	3	5	13
1:30-1:45	3	1	4	2	10	6	0	6	4	16
1:45-2:00	3	2	6	0	11	2	2	5	4	13
2:00-2:15	1	1	8	0	10	3	1	7	4	15
2:15-2:30	2	0	5	0	7	4	3	7	4	18
2:30-2:45	6	2	5	1	14	2	2	6	2	12
2:45-3:00	2	1	5	0	8	0	1	2	1	4
3:00-3:15	2	4	7	0	13	3	2	6	4	15
3:15-3:30	0	2	7	0	9	1	1	5	3	10
3:30-3:45	3	3	14	0	20	2	1	8	4	15
3:45-4:00	2	1	14	0	17	1	3	13	2	19
4:00-4:15	3	3	16	0	22	1	0	8	1	10
4:15-4:30	2	2	14	0	18	1	3	12	0	16
4:30-4:45	0	1	16	0	17	2	1	10	0	13
4:45-5:00	5	0	17	0	22	0	0	8	0	8
5:00-5:15	2	1	11	0	14	4	0	12	0	16
5:15-5:30	2	0	11	0	13	4	0	12	0	16
5:30-5:45	0	0	9	0	9	2	0	5	0	7
5:45-6:00	3	1	9	0	13	1	0	10	0	11
6:00-6:15	1	0	11	0	12	2	1	10	0	13
6:15-6:30	1	1	3	0	5	1	1	4	0	6
TOTALS	121	39	324	10	494	118	42	330	131	621

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM -6:15 PM - Business Day)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	13	0	6	0	19	11	3	27	13	54
6:15-7:15	9	0	9	0	18	11	3	33	16	63
6:30-7:30	8	0	11	0	19	12	3	28	16	59
6:45-7:45	8	0	9	1	18	10	3	30	11	54
7:00-8:00	8	0	10	2	20	9	2	19	9	39
7:15-8:15	9	1	8	2	20	11	1	12	7	31
7:30-8:30	9	1	10	2	22	10	1	12	9	32
7:45-8:45	8	1	10	2	21	10	1	13	14	38
8:00-9:00	**5**	**1**	**10**	**1**	**17**	**10**	**2**	**14**	**18**	**44**
8:15-9:15	5	0	8	1	14	7	2	16	18	43
8:30-9:30	6	1	7	1	15	8	1	11	15	35
8:45-9:45	9	1	6	0	16	6	1	10	16	33
9:00-10:00	9	1	11	0	21	5	2	12	16	35
9:15-10:15	11	1	19	0	31	6	2	14	15	37
9:30-10:30	12	0	26	0	38	4	2	23	17	46
9:45-10:45	10	1	31	0	42	8	3	27	14	52
10:00-11:00	10	3	30	1	44	8	2	33	13	56
10:15-11:15	11	3	29	1	44	8	3	33	15	59
10:30-11:30	9	3	25	1	38	9	3	32	13	57
10:45-11:45	8	2	24	1	35	9	3	31	13	56
11:00-12:00	12	0	25	0	37	10	2	28	13	53
11:15-12:15	12	0	26	0	38	11	2	25	11	49
11:30-12:30	12	1	33	0	46	16	3	27	10	56
11:45-12:45	16	4	32	0	52	14	3	33	9	59
12:00-1:00	14	5	32	2	53	16	4	32	9	61
12:15-1:15	14	7	28	3	52	16	5	35	9	65
12:30-1:30	14	7	19	3	43	13	5	28	13	59
12:45-1:45	13	5	19	5	42	17	4	21	15	57
1:00-2:00	13	6	18	3	40	15	5	20	15	55
1:15-2:15	9	5	22	2	38	15	4	21	17	57
1:30-2:30	9	4	23	2	38	15	6	25	16	62
1:45-2:45	12	5	24	1	42	11	8	25	14	58
2:00-3:00	11	4	23	1	39	9	7	22	11	49
2:15-3:15	12	7	22	1	42	9	8	21	11	49
2:30-3:30	10	9	24	1	44	6	6	19	10	41
2:45-3:45	7	10	33	0	50	6	5	21	12	44
3:00-4:00	7	10	42	0	59	7	7	32	13	59
3:15-4:15	8	9	51	0	68	5	5	34	10	54
3:30-4:30	**10**	**9**	**58**	**0**	**77**	**5**	**7**	**41**	**7**	**60**
3:45-4:45	7	7	60	0	74	5	7	43	3	58
4:00-5:00	**10**	**6**	**63**	**0**	**79**	**4**	**4**	**38**	**1**	**47**
4:15-5:15	9	4	58	0	71	7	4	42	0	53
4:30-5:30	9	2	55	0	66	10	1	42	0	53
4:45-5:45	9	1	48	0	58	10	0	37	0	47
5:00-6:00	7	2	40	0	49	11	0	39	0	50
5:15-6:15	6	1	40	0	47	9	1	37	0	47
5:30-6:30	5	2	32	0	39	6	2	29	0	37

APPENDIX B

Daily Traffic Count Data

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H
Tustin, CA. 92780

A

Location : LIVE OAK AVENUE
Segment : LONGDEN AVE TO ARROW HIGHWAY
Client : CITY OF IRWINDAL

Site: IRWINDALE
Date: 01/09/13
Day: Wednesday

Interval	EB				WB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	20	69	179	733	34	122	207	817	54	191	386	1,550
12:15	14		182		30		196		44		378	
12:30	21		180		27		216		48		396	
12:45	14		192		31		198		45		390	
01:00	18	61	200	848	26	71	202	839	44	132	402	1,687
01:15	18		212		18		222		36		434	
01:30	11		228		11		191		22		419	
01:45	14		208		16		224		30		432	
02:00	22	67	234	1,020	18	55	190	883	40	122	424	1,903
02:15	14		238		16		227		30		465	
02:30	11		288		9		248		20		536	
02:45	20		260		12		218		32		478	
03:00	18	78	280	1,321	15	59	210	928	33	137	490	2,249
03:15	8		332		15		223		23		555	
03:30	23		350		10		238		33		588	
03:45	29		359		19		257		48		616	
04:00	24	178	420	1,725	23	165	196	877	47	343	616	2,602
04:15	34		411		26		226		60		637	
04:30	44		420		48		248		92		668	
04:45	76		474		68		207		144		681	
05:00	84	440	534	2,089	86	541	248	1,181	170	981	782	3,270
05:15	90		565		108		327		198		892	
05:30	156		498		142		308		298		806	
05:45	110		492		205		298		315		790	
06:00	149	696	359	1,302	205	1,327	238	837	354	2,023	597	2,139
06:15	184		412		294		205		478		617	
06:30	182		330		343		208		525		538	
06:45	181		201		485		186		666		387	
07:00	206	989	171	543	516	2,364	148	541	722	3,353	319	1,084
07:15	213		148		680		152		893		300	
07:30	258		114		642		134		900		248	
07:45	312		110		526		107		838		217	
08:00	320	1,154	122	428	508	1,743	106	386	828	2,897	228	814
08:15	288		108		438		86		726		194	
08:30	270		90		409		96		679		186	
08:45	276		108		388		98		664		206	
09:00	228	845	98	354	274	929	84	340	502	1,774	182	694
09:15	210		94		246		88		456		182	
09:30	211		88		211		82		422		170	
09:45	196		74		198		86		394		160	
10:00	146	704	74	230	182	704	82	258	328	1,408	156	488
10:15	212		55		184		61		396		116	
10:30	168		58		162		49		330		107	
10:45	178		43		176		66		354		109	
11:00	176	693	58	138	183	720	55	162	359	1,413	113	300
11:15	196		38		186		28		382		66	
11:30	146		26		172		33		318		59	
11:45	175		16		179		46		354		62	
Totals	5,974		10,731		8,800		8,049		14,774		18,780	
Split%	40.4		57.1		59.6		42.9					
Day Totals		16,705				16,849				33,554		
Day Splits		49.8				50.2						
Peak Hour	07:45		05:00		07:00		05:00		07:15		05:00	
Volume	1,190		2,089		2,364		1,181		3,459		3,270	
Factor	0.93		0.92		0.87		0.90		0.96		0.92	

* Data File : D1211144

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H
Tustin, CA. 92780

Location: : ARROW HIGHWAY
Segment: : AVENIDA BARBOSA TO I-605 FWY
Client: : CITY OF IRWINDAL

Site: IRWINDALE
Date: 01/08/13
Day: Tuesday

Interval	EB				WB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	18	70	114	468	12	55	114	448	30	125	228	916
12:15	17		117		17		120		34		237	
12:30	18		116		12		107		30		223	
12:45	17		121		14		107		31		228	
01:00	6	33	115	541	17	51	100	452	23	84	215	993
01:15	5		144		12		114		17		258	
01:30	12		134		14		118		26		252	
01:45	10		148		8		120		18		268	
02:00	14	36	122	515	15	48	128	523	29	84	250	1,038
02:15	8		120		11		124		19		244	
02:30	10		146		8		140		18		286	
02:45	4		127		14		131		18		258	
03:00	19	60	126	600	8	76	137	560	27	136	263	1,160
03:15	12		130		16		140		28		270	
03:30	15		174		14		134		29		308	
03:45	14		170		38		149		52		319	
04:00	12	85	183	770	30	140	99	454	42	225	282	1,224
04:15	18		162		20		125		38		287	
04:30	28		215		36		122		64		337	
04:45	27		210		54		108		81		318	
05:00	20	147	224	916	52	399	136	532	72	546	360	1,448
05:15	33		262		65		146		98		408	
05:30	50		222		118		136		168		358	
05:45	44		208		164		114		208		322	
06:00	47	261	182	551	150	1,093	108	400	197	1,354	290	951
06:15	74		165		235		116		309		281	
06:30	70		126		286		98		356		224	
06:45	70		78		422		78		492		156	
07:00	76	404	100	275	432	1,918	55	241	508	2,322	155	516
07:15	86		79		490		68		576		147	
07:30	106		56		532		66		638		122	
07:45	136		40		464		52		600		92	
08:00	106	441	62	187	402	1,256	42	156	508	1,697	104	343
08:15	120		50		354		42		474		92	
08:30	117		38		264		34		381		72	
08:45	98		37		236		38		334		75	
09:00	90	389	38	156	182	602	36	136	272	991	74	292
09:15	95		38		148		40		243		78	
09:30	104		45		128		30		232		75	
09:45	100		35		144		30		244		65	
10:00	94	384	24	125	122	455	36	119	216	839	60	244
10:15	95		39		118		27		213		66	
10:30	107		36		132		30		239		66	
10:45	88		26		83		26		171		52	
11:00	92	364	20	76	110	426	36	113	202	790	56	189
11:15	74		22		100		17		174		39	
11:30	84		14		109		24		193		38	
11:45	114		20		107		36		221		56	
Totals	2,674		5,180		6,519		4,134		9,193		9,314	
Split%	29.1		55.6		70.9		44.4					
Day Totals		7,854				10,653				18,507		
Day Splits		42.4				57.6						
Peak Hour	07:45		04:45		07:00		03:00		07:00		05:00	
Volume	479		918		1,918		560		2,322		1,448	
Factor	0.88		0.88		0.90		0.94		0.91		0.89	

Data File : D1211119

Counts Unlimietd, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
Arrow Highway
E/ Live Oak Lane
24 Hour Directional Volume Count

IRWAHLO
Site Code: 051-13167
Date Start: 14-May-13
Date End: 14-May-13

Start Time	14-May-13 Tue	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		16	97			23	126				
12:15		20	109			8	124				
12:30		22	119			12	134				
12:45		22	123	80	448	12	109	55	493	135	941
01:00		8	138			11	108				
01:15		7	145			7	122				
01:30		7	161			6	104				
01:45		9	125	31	569	8	113	32	447	63	1016
02:00		12	120			4	131				
02:15		13	133			13	128				
02:30		9	187			6	127				
02:45		3	172	37	612	19	149	42	535	79	1147
03:00		7	197			15	117				
03:15		5	172			9	135				
03:30		18	205			14	137				
03:45		18	217	48	791	18	124	56	513	104	1304
04:00		11	217			13	133				
04:15		21	195			14	142				
04:30		12	**255**			37	144				
04:45		34	**246**	78	913	45	**137**	109	556	187	1469
05:00		36	**238**			66	**186**				
05:15		43	**272**			84	**140**				
05:30		55	243			147	**163**				
05:45		76	251	210	1004	177	107	474	596	684	1600
06:00		57	204			186	115				
06:15		53	176			293	113				
06:30		65	160			375	87				
06:45		97	119	272	659	**432**	92	1286	407	1558	1066
07:00		108	116			**433**	83				
07:15		123	96			**538**	82				
07:30		139	91			**512**	78				
07:45		**164**	93	534	396	430	79	1913	322	2447	718
08:00		**144**	60			410	64				
08:15		**139**	82			363	63				
08:30		**142**	66			302	52				
08:45		151	55	576	263	275	46	1350	225	1926	488
09:00		104	59			194	49				
09:15		111	60			163	41				
09:30		110	56			171	54				
09:45		93	45	418	220	158	40	686	184	1104	404
10:00		98	40			135	40				
10:15		88	49			100	34				
10:30		75	46			96	40				
10:45		90	40	351	175	117	29	448	143	799	318
11:00		104	33			124	20				
11:15		105	35			120	21				
11:30		93	23			126	27				
11:45		104	21	406	112	116	21	486	89	892	201
Total		3041	6162	3041	6162	6937	4510	6937	4510	9978	10672
Combined Total		9203		9203		11447		11447		20650	
AM Peak		07:45				06:45					
Vol.		589				1915					
P.H.F.		0.898				0.890					
PM Peak			04:30				04:45				
Vol.			1011				626				
P.H.F.			0.929				0.841				
Percentage		33.0%	67.0%			60.6%	39.4%				
ADT/AADT		ADT 20,650		AADT 20,650							

Counts Unlimietd, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
Arrow Highway
E/ Rivergrade Road
24 Hour Directional Volume Count

IRWAHRG
Site Code: 051-13167
Date Start: 14-May-13
Date End: 14-May-13

Start Time	14-May-13 Tue	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		8	83			13	83				
12:15		15	71			4	93				
12:30		20	78			8	98				
12:45		14	75	57	307	8	91	33	365	90	672
01:00		4	84			8	67				
01:15		8	90			4	91				
01:30		5	103			5	82				
01:45		5	95	22	372	4	76	21	316	43	688
02:00		10	81			3	101				
02:15		5	93			2	95				
02:30		4	135			4	100				
02:45		5	149	24	458	10	124	19	420	43	878
03:00		6	133			5	83				
03:15		3	152			5	101				
03:30		9	187			8	108				
03:45		12	180	30	652	11	104	29	396	59	1048
04:00		6	192			10	111				
04:15		15	182			10	109				
04:30		5	187			36	108				
04:45		19	**233**	45	794	37	**103**	93	431	138	1225
05:00		22	**192**			48	**143**				
05:15		22	**238**			65	**113**				
05:30		33	**242**			135	**114**				
05:45		51	216	128	888	151	81	399	451	527	1339
06:00		40	198			159	99				
06:15		40	150			254	90				
06:30		37	146			339	73				
06:45		62	126	179	620	379	70	1131	332	1310	952
07:00		60	85			**422**	69				
07:15		90	97			**485**	68				
07:30		**93**	84			**458**	71				
07:45		**108**	95	351	361	**381**	62	1746	270	2097	631
08:00		**90**	63			389	48				
08:15		**97**	70			343	42				
08:30		85	55			284	44				
08:45		97	40	369	228	259	39	1275	173	1644	401
09:00		66	46			155	41				
09:15		73	50			141	29				
09:30		70	45			136	38				
09:45		62	35	271	176	114	34	546	142	817	318
10:00		60	34			108	37				
10:15		72	32			83	21				
10:30		52	39			70	26				
10:45		71	25	255	130	92	18	353	102	608	232
11:00		64	35			95	17				
11:15		71	25			77	19				
11:30		76	22			84	22				
11:45		80	17	291	99	77	15	333	73	624	172
Total		2022	5085	2022	5085	5978	3471	5978	3471	8000	8556
Combined Total		7107		7107		9449		9449		16556	
AM Peak		07:30				07:00					
Vol.		388				1746					
P.H.F.		0.898				0.900					
PM Peak			04:45				04:45				
Vol.			905				473				
P.H.F.			0.935				0.827				
Percentage		28.5%	71.5%			63.3%	36.7%				
ADT/AADT		ADT 16,556		AADT 16,556							

E

Transportation Studies, Inc.
2640 Walnut Avenue, Ste H
Tustin, CA. 92780

Location : ARROW HIGHWAY
Segment : LIVE OAK AVE TO HEINTZ STREET
Client : CITY OF IRWINDAL

Site: IRWINDALE
Date: 01/08/13
Day: Tuesday

Interval	EB				WB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	22	78	258	1,070	32	84	211	873	54	162	469	1,943
12:15	24		276		16		221		40		497	
12:30	18		246		16		215		34		461	
12:45	14		290		20		226		34		516	
01:00	16	44	250	1,050	30	76	245	977	46	120	495	2,027
01:15	12		246		14		258		26		504	
01:30	6		266		14		248		20		514	
01:45	10		288		18		226		28		514	
02:00	16	42	280	1,304	14	60	260	1,066	30	102	540	2,370
02:15	6		306		18		240		24		546	
02:30	6		341		14		310		20		651	
02:45	14		377		14		256		28		633	
03:00	20	79	386	1,656	22	147	216	954	42	226	602	2,610
03:15	15		430		34		218		49		648	
03:30	20		426		46		269		66		695	
03:45	24		414		45		251		69		665	
04:00	14	227	450	1,853	22	192	264	970	36	419	714	2,823
04:15	39		445		42		216		81		661	
04:30	68		460		64		264		132		724	
04:45	106		498		64		226		170		724	
05:00	72	468	487	1,987	104	724	304	1,042	176	1,192	791	3,029
05:15	84		516		120		282		204		798	
05:30	126		512		224		236		350		748	
05:45	186		472		276		220		462		692	
06:00	89	586	460	1,538	282	1,500	185	632	371	2,086	645	2,170
06:15	156		439		343		163		499		602	
06:30	160		368		418		146		578		514	
06:45	181		271		457		138		638		409	
07:00	174	851	241	662	507	1,983	111	377	681	2,834	352	1,039
07:15	192		171		504		98		696		269	
07:30	234		134		520		86		754		220	
07:45	251		116		452		82		703		198	
08:00	228	960	112	382	422	1,454	78	294	650	2,414	190	676
08:15	266		102		387		75		653		177	
08:30	252		100		354		71		606		171	
08:45	214		68		291		70		505		138	
09:00	200	817	82	259	201	829	65	296	401	1,646	147	555
09:15	196		61		224		73		420		134	
09:30	221		59		194		62		415		121	
09:45	200		57		210		96		410		153	
10:00	188	775	60	209	202	794	54	208	390	1,569	114	417
10:15	188		64		192		46		380		110	
10:30	181		54		224		60		405		114	
10:45	218		31		176		48		394		79	
11:00	237	931	55	152	206	812	59	157	443	1,743	114	309
11:15	222		37		197		26		419		63	
11:30	214		34		196		44		410		78	
11:45	258		26		213		28		471		54	
Totals	5,858		12,122		8,655		7,846		14,513		19,968	
Split%	40.4		60.7		59.6		39.3					
Day Totals		17,980				16,501				34,481		
Day Splits		52.1				47.9						
Peak Hour	07:45		04:45		06:45		04:30		07:00		04:45	
Volume	997		2,013		1,988		1,076		2,834		3,061	
Factor	0.94		0.98		0.96		0.88		0.94		0.96	

Data File : D1211122

F

Transportation Studies, Inc.
2640 Walnut Avenue, Ste H
Tustin, CA. 92780

Location : LIVE OAK AVENUE
Segment : ARROW HIGHWAY TO I-605 FWY
Client : CITY OF IRWINDAL

Site: IRWINDALE
Date: 01/09/13
Day: Wednesday

Interval	EB				WB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	21	68	166	699	22	88	220	843	43	156	386	1,542
12:15	19		187		24		208		43		395	
12:30	18		194		24		210		42		404	
12:45	10		152		18		205		28		357	
01:00	12	46	206	744	31	65	208	822	43	111	414	1,566
01:15	14		167		10		182		24		349	
01:30	9		198		10		216		19		414	
01:45	11		173		14		216		25		389	
02:00	17	59	197	857	12	55	200	776	29	114	397	1,633
02:15	11		182		17		208		28		390	
02:30	17		254		12		194		29		448	
02:45	14		224		14		174		28		398	
03:00	20	68	223	1,023	16	72	186	753	36	140	409	1,776
03:15	12		258		12		186		24		444	
03:30	24		258		18		187		42		445	
03:45	12		284		26		194		38		478	
04:00	34	162	318	1,380	12	141	190	791	46	303	508	2,171
04:15	28		325		31		194		59		519	
04:30	51		344		40		216		91		560	
04:45	49		393		58		191		107		584	
05:00	91	460	437	1,758	66	372	172	723	157	832	609	2,481
05:15	98		496		88		188		186		684	
05:30	131		436		82		191		213		627	
05:45	140		389		136		172		276		561	
06:00	139	609	292	1,056	114	726	150	624	253	1,335	442	1,680
06:15	144		328		146		168		290		496	
06:30	148		253		170		172		318		425	
06:45	178		183		296		134		474		317	
07:00	188	846	137	434	283	1,168	127	416	471	2,014	264	850
07:15	194		116		289		100		483		216	
07:30	208		108		317		115		525		223	
07:45	256		73		279		74		535		147	
08:00	243	971	90	308	254	1,067	86	275	497	2,038	176	583
08:15	264		86		252		61		516		147	
08:30	246		60		301		50		547		110	
08:45	218		72		260		78		478		150	
09:00	213	771	72	255	205	779	74	298	418	1,550	146	553
09:15	218		59		186		76		404		135	
09:30	174		68		180		86		354		154	
09:45	166		56		208		62		374		118	
10:00	144	650	66	217	174	689	36	155	318	1,339	102	372
10:15	195		56		188		51		383		107	
10:30	159		54		158		39		317		93	
10:45	152		41		169		29		321		70	
11:00	162	648	40	109	201	829	34	125	363	1,477	74	234
11:15	178		38		160		38		338		76	
11:30	136		17		232		30		368		47	
11:45	172		14		236		23		408		37	
Totals	5,358		8,840		6,051		6,601		11,409		15,441	
Split%	47.0		57.3		53.0		42.7					
Day Totals		14,198				12,652				26,850		
Day Splits		52.9				47.1						
Peak Hour	07:45		04:45		06:45		12:00		07:45		04:45	
Volume	1,009		1,762		1,185		843		2,095		2,504	
Factor	0.96		0.89		0.93		0.96		0.96		0.92	

Data File : D1211145

Counts Unlimietd, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
Live Oak Avenue
E/ Graham Access Road
24 Hour Directional Volume Count

IRWLOGA
Site Code: 051-13167
Date Start: 14-May-13
Date End: 14-May-13

Start Time	14-May-13 Tue	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		17	176			33	188				
12:15		12	141			13	187				
12:30		18	127			19	148				
12:45		11	151	58	595	16	139	81	662	139	1257
01:00		17	148			33	158				
01:15		17	150			13	156				
01:30		19	181			8	168				
01:45		9	217	62	696	7	164	61	646	123	1342
02:00		11	196			16	184				
02:15		10	173			10	180				
02:30		16	240			17	210				
02:45		21	222	58	831	12	165	55	739	113	1570
03:00		29	249			20	188				
03:15		22	257			17	160				
03:30		16	282			32	226				
03:45		23	278	90	1066	31	189	100	763	190	1829
04:00		13	262			40	161				
04:15		21	339			58	152				
04:30		41	343			73	**213**				
04:45		64	**360**	139	1304	91	**160**	262	686	401	1990
05:00		63	**320**			128	**272**				
05:15		85	**353**			144	**242**				
05:30		126	**383**			212	190				
05:45		148	301	422	1357	216	162	700	866	1122	2223
06:00		104	288			239	176				
06:15		112	263			332	139				
06:30		132	254			**340**	104				
06:45		166	176	514	981	**358**	90	1269	509	1783	1490
07:00		145	183			**342**	95				
07:15		167	133			**345**	75				
07:30		185	116			327	78				
07:45		**211**	96	708	528	258	60	1272	308	1980	836
08:00		**166**	76			263	75				
08:15		**214**	103			258	73				
08:30		**209**	74			304	81				
08:45		200	63	789	316	217	59	1042	288	1831	604
09:00		147	63			208	52				
09:15		118	70			161	66				
09:30		154	72			191	56				
09:45		126	76	545	281	168	49	728	223	1273	504
10:00		155	57			149	47				
10:15		127	55			178	47				
10:30		136	56			173	78				
10:45		100	44	518	212	148	31	648	203	1166	415
11:00		124	30			156	40				
11:15		128	45			128	28				
11:30		126	23			161	45				
11:45		138	20	516	118	152	23	597	136	1113	254
Total		4419	8285	4419	8285	6815	6029	6815	6029	11234	14314
Combined Total		12704		12704		12844		12844		25548	
AM Peak		07:45				06:30					
Vol.		800				1385					
P.H.F.		0.935				0.967					
PM Peak			04:45				04:30				
Vol.			1416				887				
P.H.F.			0.924				0.815				
Percentage		34.8%	65.2%			53.1%	46.9%				
ADT/AADT		ADT 25,548		AADT 25,548							

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H

Tustin, CA. 92780

H

Location : LIVE OAK AVENUE

Segment : RIVERGRADE RD TO ARROW HIGHWAY

Client : CITY OF IRWINDAL

Site: IRWINDALE

Date: 01/15/13

Day: Tuesday

Interval	EB				WB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	22	68	178	734	16	56	185	697	38	124	363	1,431
12:15	24		205		12		159		36		364	
12:30	14		170		16		171		30		341	
12:45	8		181		12		182		20		363	
01:00	12	40	180	795	24	58	166	717	36	98	346	1,512
01:15	8		176		11		204		19		380	
01:30	14		211		16		187		30		398	
01:45	6		228		7		160		13		388	
02:00	10	35	206	942	16	64	194	778	26	99	400	1,720
02:15	13		210		16		188		29		398	
02:30	0		264		14		186		14		450	
02:45	12		262		18		210		30		472	
03:00	16	54	284	1,291	20	105	134	703	36	159	418	1,994
03:15	12		320		16		166		28		486	
03:30	14		364		34		213		48		577	
03:45	12		323		35		190		47		513	
04:00	14	158	364	1,468	44	252	204	758	58	410	568	2,226
04:15	22		362		56		174		78		536	
04:30	48		379		78		180		126		559	
04:45	74		363		74		200		148		563	
05:00	56	340	446	1,601	113	734	196	744	169	1,074	642	2,345
05:15	75		325		162		232		237		557	
05:30	76		448		231		180		307		628	
05:45	133		382		228		136		361		518	
06:00	88	429	357	1,198	263	1,367	118	450	351	1,796	475	1,648
06:15	101		318		300		116		401		434	
06:30	122		301		382		114		504		415	
06:45	118		222		422		102		540		324	
07:00	118	577	204	633	430	1,684	84	255	548	2,261	288	888
07:15	140		160		446		62		586		222	
07:30	142		147		464		65		606		212	
07:45	177		122		344		44		521		166	
08:00	201	742	90	298	337	1,189	60	233	538	1,931	150	531
08:15	202		74		329		70		531		144	
08:30	175		72		263		59		438		131	
08:45	164		62		260		44		424		106	
09:00	188	625	50	209	228	754	40	186	416	1,379	90	395
09:15	134		57		182		44		316		101	
09:30	159		48		180		48		339		96	
09:45	144		54		164		54		308		108	
10:00	138	549	44	180	138	582	44	190	276	1,131	88	370
10:15	125		46		144		40		269		86	
10:30	150		56		158		46		308		102	
10:45	136		34		142		60		278		94	
11:00	147	676	28	129	140	611	46	129	287	1,287	74	258
11:15	168		32		163		19		331		51	
11:30	184		41		152		40		336		81	
11:45	177		28		156		24		333		52	
Totals	4,293		9,478		7,456		5,840		11,749		15,318	
Split%	36.5		61.9		63.5		38.1					
Day Totals		13,771				13,296				27,067		
Day Splits		50.9				49.1						
Peak Hour	07:45		05:00		06:45		04:30		06:45		04:45	
Volume	755		1,601		1,762		808		2,280		2,390	
Factor	0.93		0.89		0.95		0.87		0.94		0.93	

Data File : D1211147

Counts Unlimietd, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
Live Oak Avenue
E/ Baldwin Park Boulevard
24 Hour Directional Volume Count

IRWLOBP
Site Code: 051-13167
Date Start: 14-May-13
Date End: 14-May-13

Start Time	14-May-13 Tue	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		29	246			34	202				
12:15		13	184			18	190				
12:30		15	187			12	179				
12:45		13	178	70	795	22	179	86	750	156	1545
01:00		14	178			34	197				
01:15		16	182			10	166				
01:30		12	212			11	176				
01:45		8	219	50	791	14	179	69	718	119	1509
02:00		11	230			17	224				
02:15		7	216			8	195				
02:30		15	310			10	253				
02:45		24	263	57	1019	18	217	53	889	110	1908
03:00		16	277			20	182				
03:15		11	300			17	182				
03:30		29	327			38	245				
03:45		26	314	82	1218	38	229	113	838	195	2056
04:00		19	291			54	191				
04:15		28	355			46	173				
04:30		68	359			60	**224**				
04:45		88	**395**	203	1400	87	**193**	247	781	450	2181
05:00		80	**342**			123	**277**				
05:15		88	**366**			143	**220**				
05:30		165	**391**			223	211				
05:45		172	353	505	1452	237	169	726	877	1231	2329
06:00		114	305			265	177				
06:15		175	285			283	168				
06:30		177	255			**390**	113				
06:45		164	190	630	1035	**361**	113	1299	571	1929	1606
07:00		144	194			**353**	113				
07:15		189	168			**371**	104				
07:30		**215**	127			368	99				
07:45		**243**	109	791	598	349	95	1441	411	2232	1009
08:00		**201**	93			317	91				
08:15		**219**	105			370	98				
08:30		167	71			350	82				
08:45		190	79	777	348	275	65	1312	336	2089	684
09:00		142	54			210	82				
09:15		126	70			200	80				
09:30		166	73			196	67				
09:45		164	59	598	256	196	69	802	298	1400	554
10:00		153	55			157	62				
10:15		150	50			172	52				
10:30		147	64			167	65				
10:45		133	35	583	204	138	38	634	217	1217	421
11:00		163	35			149	40				
11:15		161	39			132	35				
11:30		179	38			172	60				
11:45		206	21	709	133	175	38	628	173	1337	306
Total		5055	9249	5055	9249	7410	6859	7410	6859	12465	16108
Combined Total		14304		14304		14269		14269		28573	
AM Peak		07:30				06:30					
Vol.		878				1475					
P.H.F.		0.903				0.946					
PM Peak			04:45				04:30				
Vol.			1494				914				
P.H.F.			0.946				0.825				
Percentage		35.3%	64.7%			51.9%	48.1%				
ADT/AADT		ADT 28,573		AADT 28,573							

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H

Tustin, CA. 92780

Location : AVENIDA BARBOSA STREET — Site: IRWINDALE

Segment : ARROW HIGHWAY TO BUENA VISTA — Date: 01/08/13

Client : CITY OF IRWINDAL — Day: Tuesday

Interval	NB				SB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	8	27	80	301	11	34	54	272	19	61	134	573
12:15	5		79		5		73		10		152	
12:30	7		62		12		81		19		143	
12:45	7		80		6		64		13		144	
01:00	8	22	76	304	2	16	74	287	10	38	150	591
01:15	4		60		4		79		8		139	
01:30	6		84		4		64		10		148	
01:45	4		84		6		70		10		154	
02:00	6	18	82	360	6	21	64	304	12	39	146	664
02:15	6		82		1		74		7		156	
02:30	2		104		12		98		14		202	
02:45	4		92		2		68		6		160	
03:00	4	52	95	409	6	23	89	365	10	75	184	774
03:15	8		110		9		90		17		200	
03:30	10		98		2		90		12		188	
03:45	30		106		6		96		36		202	
04:00	13	97	79	317	11	58	136	516	24	155	215	833
04:15	26		86		12		102		38		188	
04:30	24		74		14		128		38		202	
04:45	34		78		21		150		55		228	
05:00	30	190	91	317	37	146	200	589	67	336	291	906
05:15	40		98		41		154		81		252	
05:30	46		71		34		154		80		225	
05:45	74		57		34		81		108		138	
06:00	72	462	72	220	30	144	98	288	102	606	170	508
06:15	98		59		32		86		130		145	
06:30	116		43		35		55		151		98	
06:45	176		46		47		49		223		95	
07:00	143	749	32	135	48	220	33	119	191	969	65	254
07:15	162		39		46		34		208		73	
07:30	212		32		64		28		276		60	
07:45	232		32		62		24		294		56	
08:00	220	710	23	99	52	209	20	72	272	919	43	171
08:15	211		26		53		16		264		42	
08:30	132		21		60		18		192		39	
08:45	147		29		44		18		191		47	
09:00	122	397	16	73	60	252	12	50	182	649	28	123
09:15	108		27		67		10		175		37	
09:30	77		16		66		18		143		34	
09:45	90		14		59		10		149		24	
10:00	76	290	12	53	46	209	18	54	122	499	30	107
10:15	86		16		48		15		134		31	
10:30	68		12		60		10		128		22	
10:45	60		13		55		11		115		24	
11:00	72	316	14	64	74	253	2	38	146	569	16	102
11:15	92		11		60		10		152		21	
11:30	78		18		46		20		124		38	
11:45	74		21		73		6		147		27	
Totals	3,330		2,652		1,585		2,954		4,915		5,606	
Split%	67.8		47.3		32.2		52.7					
Day Totals		5,982				4,539				10,521		
Day Splits		56.9				43.1						
Peak Hour	07:30		03:00		11:00		04:45		07:30		04:45	
Volume	875		409		253		658		1,106		996	
Factor	0.94		0.93		0.85		0.82		0.94		0.86	

* Data File : D1211126

Counts Unlimietd, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
Rivergrade Road
S/ Arrow Highway
24 Hour Directional Volume Count

IRWRGAH
Site Code: 051-13167
Date Start: 14-May-13
Date End: 14-May-13

Start Time	14-May-13 Tue	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		8	50			4	26				
12:15		5	31			4	24				
12:30		4	41			3	**47**				
12:45		5	23	22	145	7	**41**	18	138	40	283
01:00		3	40			2	**39**				
01:15		2	34			1	**58**				
01:30		1	23			3	46				
01:45		4	35	10	132	2	36	8	179	18	311
02:00		1	27			2	36				
02:15		7	31			7	29				
02:30		1	32			0	44				
02:45		10	25	19	115	0	32	9	141	28	256
03:00		10	35			0	60				
03:15		5	31			1	21				
03:30		8	42			4	32				
03:45		4	26	27	134	5	24	10	137	37	271
04:00		7	28			1	35				
04:15		5	34			22	23				
04:30		5	38			10	40				
04:45		13	**32**	30	132	14	45	47	143	77	275
05:00		10	**53**			13	27				
05:15		24	**31**			12	33				
05:30		17	**49**			33	30				
05:45		19	30	70	163	28	30	86	120	156	283
06:00		26	19			26	25				
06:15		41	28			18	15				
06:30		37	14			17	13				
06:45		46	28	150	89	44	21	105	74	255	163
07:00		26	16			46	23				
07:15		37	15			52	11				
07:30		**60**	15			39	14				
07:45		**56**	17	179	63	64	10	201	58	380	121
08:00		**30**	16			**57**	15				
08:15		**38**	12			**51**	17				
08:30		23	9			**44**	20				
08:45		33	5	124	42	**66**	14	218	66	342	108
09:00		32	7			42	9				
09:15		26	9			43	16				
09:30		29	13			39	10				
09:45		40	4	127	33	29	16	153	51	280	84
10:00		26	7			20	4				
10:15		22	11			26	17				
10:30		24	15			28	10				
10:45		29	10	101	43	25	12	99	43	200	86
11:00		28	4			38	5				
11:15		46	4			37	9				
11:30		48	5			29	3				
11:45		43	9	165	22	40	3	144	20	309	42
Total		1024	1113	1024	1113	1098	1170	1098	1170	2122	2283
Combined Total		2137		2137		2268		2268		4405	
AM Peak		07:30				08:00					
Vol.		184				218					
P.H.F.		0.767				0.826					
PM Peak			04:45				00:30				
Vol.			165				185				
P.H.F.			0.778				0.797				
Percentage		47.9%	52.1%			48.4%	51.6%				
ADT/AADT		ADT 4,405		AADT 4,405							

Counts Unlimietd, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
Baldwin Park Boulevard
S/ Live Oak Avenue
24 Hour Directional Volume Count

IRWBPLO
Site Code: 051-13167
Date Start: 14-May-13
Date End: 14-May-13

Start Time	14-May-13 Tue	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		8	54			5	44				
12:15		3	40			1	38				
12:30		2	48			6	37				
12:45		5	50	18	192	3	42	15	161	33	353
01:00		2	53			2	35				
01:15		5	41			1	55				
01:30		6	38			6	37				
01:45		1	44	14	176	3	40	12	167	26	343
02:00		3	**50**			2	52				
02:15		0	**52**			1	50				
02:30		1	**56**			1	72				
02:45		8	**58**	12	216	4	79	8	253	20	469
03:00		6	47			5	69				
03:15		2	48			3	67				
03:30		8	56			6	91				
03:45		12	55	28	206	7	99	21	326	49	532
04:00		4	43			3	104				
04:15		12	41			4	92				
04:30		26	42			4	112				
04:45		32	47	74	173	3	**141**	14	449	88	622
05:00		37	55			4	**145**				
05:15		42	36			7	**152**				
05:30		64	54			18	**126**				
05:45		72	48	215	193	23	127	52	550	267	743
06:00		58	36			25	97				
06:15		112	44			25	93				
06:30		93	40			43	82				
06:45		97	32	360	152	19	56	112	328	472	480
07:00		84	21			36	58				
07:15		**107**	38			42	45				
07:30		**125**	33			44	43				
07:45		**115**	39	431	131	**56**	51	178	197	609	328
08:00		**102**	32			**36**	43				
08:15		101	25			**46**	48				
08:30		61	28			**51**	28				
08:45		69	26	333	111	44	35	177	154	510	265
09:00		42	14			28	33				
09:15		48	28			33	34				
09:30		44	24			30	32				
09:45		67	19	201	85	29	21	120	120	321	205
10:00		46	15			27	23				
10:15		35	10			33	20				
10:30		41	20			29	36				
10:45		52	10	174	55	34	20	123	99	297	154
11:00		41	12			26	14				
11:15		41	9			26	17				
11:30		37	7			35	17				
11:45		41	7	160	35	31	14	118	62	278	97
Total		2020	1725	2020	1725	950	2866	950	2866	2970	4591
Combined Total		3745		3745		3816		3816		7561	
AM Peak		07:15				07:45					
Vol.		449				189					
P.H.F.		0.898				0.844					
PM Peak			02:00				04:45				
Vol.			216				564				
P.H.F.			0.931				0.928				
Percentage		53.9%	46.1%			24.9%	75.1%				
ADT/AADT		ADT 7,561		AADT 7,561							

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H
Tustin, CA. 92780

Location : ARROW HIGHWAY
Segment : LIVE OAK AVE TO AVENDA BARBOSA
Client : CITY OF IRWINDAL

Site: IRWINDALE
Date: 01/08/13
Day: Tuesday

Interval	EB				WB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	12	60	160	514	10	46	184	657	22	106	344	1,171
12:15	12		112		16		160		28		272	
12:30	18		122		10		181		28		303	
12:45	18		120		10		132		28		252	
01:00	6	41	142	570	22	60	156	668	28	101	298	1,238
01:15	7		161		14		172		21		333	
01:30	16		143		14		176		30		319	
01:45	12		124		10		164		22		288	
02:00	14	36	139	555	14	40	172	711	28	76	311	1,266
02:15	4		130		8		180		12		310	
02:30	10		137		6		163		16		300	
02:45	8		149		12		196		20		345	
03:00	18	60	138	604	8	56	187	769	26	116	325	1,373
03:15	6		149		12		186		18		335	
03:30	14		169		10		210		24		379	
03:45	22		148		26		186		48		334	
04:00	22	134	167	652	36	185	192	734	58	319	359	1,386
04:15	41		164		42		188		83		352	
04:30	37		161		36		200		73		361	
04:45	34		160		71		154		105		314	
05:00	22	153	158	665	63	374	216	883	85	527	374	1,548
05:15	50		202		64		264		114		466	
05:30	44		156		108		218		152		374	
05:45	37		149		139		185		176		334	
06:00	75	347	152	482	140	914	146	484	215	1,261	298	966
06:15	86		140		210		138		296		278	
06:30	84		114		241		120		325		234	
06:45	102		76		323		80		425		156	
07:00	92	504	100	271	358	1,547	72	260	450	2,051	172	531
07:15	96		82		420		76		516		158	
07:30	152		51		419		58		571		109	
07:45	164		38		350		54		514		92	
08:00	170	610	66	203	306	1,081	43	137	476	1,691	109	340
08:15	169		54		293		34		462		88	
08:30	140		43		250		32		390		75	
08:45	131		40		232		28		363		68	
09:00	130	491	36	170	174	699	36	140	304	1,190	72	310
09:15	136		48		190		34		326		82	
09:30	102		48		167		32		269		80	
09:45	123		38		168		38		291		76	
10:00	130	462	24	118	152	619	34	106	282	1,081	58	224
10:15	117		36		164		21		281		57	
10:30	108		38		169		29		277		67	
10:45	107		20		134		22		241		42	
11:00	110	425	18	85	152	584	26	87	262	1,009	44	172
11:15	110		24		138		15		248		39	
11:30	102		22		140		18		242		40	
11:45	103		21		154		28		257		49	
Totals	3,323		4,889		6,205		5,636		9,528		10,525	
Split%	34.9		46.5		65.1		53.5					
Day Totals		8,212				11,841				20,053		
Day Splits		41.0				59.0						
Peak Hour	07:30		04:30		07:00		05:00		07:15		05:00	
Volume	655		681		1,547		883		2,077		1,548	
Factor	0.96		0.84		0.92		0.84		0.91		0.83	

Data File : D1211118

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H

Tustin, CA. 92780

Location: : RIVERGRADE ROAD
Segment: : LIVE OAK AVE TO ARROW HIGHWAY
Client: : CITY OF IRWINDAL

Site: IRWINDALE
Date: 01/09/13

Interval	NB				SB				Combined				Day: Wednesday
Begin	AM		PM		AM		PM		AM		PM		
12:00	0	2	29	93	0	2	37	138	0	4	66	231	
12:15	1		26		0		27		1		53		
12:30	0		16		0		37		0		53		
12:45	1		22		2		37		3		59		
01:00	1	7	24	77	4	9	40	167	5	16	64	244	
01:15	2		12		1		44		3		56		
01:30	1		18		4		37		5		55		
01:45	3		23		0		46		3		69		
02:00	0	3	18	75	1	2	30	120	1	5	48	195	
02:15	1		19		1		36		2		55		
02:30	1		24		0		30		1		54		
02:45	1		14		0		24		1		38		
03:00	0	7	16	70	1	6	28	126	1	13	44	196	
03:15	2		20		4		26		6		46		
03:30	1		20		0		38		1		58		
03:45	4		14		1		34		5		48		
04:00	3	18	19	78	6	13	14	53	9	31	33	131	
04:15	4		12		3		10		7		22		
04:30	3		24		0		17		3		41		
04:45	8		23		4		12		12		35		
05:00	8	46	34	74	12	60	14	56	20	106	48	130	
05:15	10		14		8		14		18		28		
05:30	10		12		18		15		28		27		
05:45	18		14		22		13		40		27		
06:00	6	36	15	39	17	45	7	22	23	81	22	61	
06:15	4		9		10		4		14		13		
06:30	16		8		2		9		18		17		
06:45	10		7		16		2		26		9		
07:00	8	87	10	38	8	82	4	17	16	169	14	55	
07:15	16		8		24		5		40		13		
07:30	34		6		20		5		54		11		
07:45	29		14		30		3		59		17		
08:00	16	80	7	19	26	100	1	9	42	180	8	28	
08:15	16		5		26		2		42		7		
08:30	22		6		24		4		46		10		
08:45	26		1		24		2		50		3		
09:00	15	60	2	13	32	110	1	10	47	170	3	23	
09:15	9		4		36		2		45		6		
09:30	20		6		18		3		38		9		
09:45	16		1		24		4		40		5		
10:00	12	62	2	12	22	101	2	7	34	163	4	19	
10:15	18		5		26		2		44		7		
10:30	17		3		23		1		40		4		
10:45	15		2		30		2		45		4		
11:00	11	99	0	5	39	135	1	7	50	234	1	12	
11:15	34		3		32		1		66		4		
11:30	22		0		40		2		62		2		
11:45	32		2		24		3		56		5		
Totals	507		593		665		732		1,172		1,325		
Split%	43.3		44.8		56.7		55.2						
Day Totals		1,100				1,397				2,497			
Day Splits		44.1				55.9							
Peak Hour	11:00		04:30		10:45		01:00		11:00		01:00		
Volume	99		95		141		167		234		244		
Factor	0.73		0.70		0.88		0.91		0.89		0.88		

Data File : D1211159

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H
Tustin, CA. 92780

Location: : RIVERGRADE ROAD
Segment: : BROOKS DR TO LIVE OAK AVE
Client: : CITY OF IRWINDAL

Site: IRWINDALE
Date: 01/09/13
Day: Wednesday

Interval	NB				SB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	5	11	67	215	2	6	34	147	7	17	101	362
12:15	4		60		2		44		6		104	
12:30	0		40		1		30		1		70	
12:45	2		48		1		39		3		87	
01:00	0	3	54	196	4	6	34	159	4	9	88	355
01:15	1		44		0		38		1		82	
01:30	0		50		2		45		2		95	
01:45	2		48		0		42		2		90	
02:00	0	3	48	242	3	7	22	131	3	10	70	373
02:15	0		64		1		28		1		92	
02:30	3		68		0		36		3		104	
02:45	0		62		3		45		3		107	
03:00	0	12	64	296	1	9	46	151	1	21	110	447
03:15	1		68		0		22		1		90	
03:30	5		88		2		44		7		132	
03:45	6		76		6		39		12		115	
04:00	6	45	96	389	6	22	30	114	12	67	126	503
04:15	6		82		4		22		10		104	
04:30	10		117		8		30		18		147	
04:45	23		94		4		32		27		126	
05:00	10	85	110	386	13	55	40	165	23	140	150	551
05:15	18		104		4		56		22		160	
05:30	23		82		14		41		37		123	
05:45	34		90		24		28		58		118	
06:00	22	115	80	243	22	115	27	80	44	230	107	323
06:15	26		78		24		15		50		93	
06:30	33		41		26		13		59		54	
06:45	34		44		43		25		77		69	
07:00	32	176	30	87	40	222	21	53	72	398	51	140
07:15	34		26		55		16		89		42	
07:30	42		18		66		10		108		28	
07:45	68		13		61		6		129		19	
08:00	46	207	16	72	52	181	2	17	98	388	18	89
08:15	60		20		44		2		104		22	
08:30	49		15		46		8		95		23	
08:45	52		21		39		5		91		26	
09:00	40	157	15	46	44	126	11	25	84	283	26	71
09:15	39		14		36		4		75		18	
09:30	36		9		24		5		60		14	
09:45	42		8		22		5		64		13	
10:00	35	137	7	34	35	116	7	21	70	253	14	55
10:15	34		17		24		8		58		25	
10:30	34		5		30		4		64		9	
10:45	34		5		27		2		61		7	
11:00	28	180	9	14	38	137	1	17	66	317	10	31
11:15	54		1		50		1		104		2	
11:30	58		1		28		10		86		11	
11:45	40		3		21		5		61		8	
Totals	1,131		2,220		1,002		1,080		2,133		3,300	
Split%	53.0		67.3		47.0		32.7					
Day Totals		3,351				2,082				5,433		
Day Splits		61.7				38.3						
Peak Hour	07:45		04:30		07:15		04:45		07:30		04:30	
Volume	223		425		234		169		439		583	
Factor	0.82		0.91		0.89		0.75		0.85		0.91	

Data File : D1211158

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APPENDIX C

Peak Hour Traffic Count Data and
Volume Development Summary

Existing Volume Summary

1: Live Oak Av. (West) / Arrow Hwy.

	AM PEAK HOUR PHF: 0.95												AM	PM PEAK HOUR PHF: 0.96										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	985	0	204	0	0	0	0	360	677	116	1,170	0	3,512	762	0	102	0	0	0	0	540	1,653	190	443	0	3,690
Existing (2013)[1]	1,003	0	208	0	0	0	0	366	689	118	1,191	0	3,575	762	0	102	0	0	0	0	540	1,653	190	443	0	3,690

2: Avenida Barbosa / Arrow Hwy.

	AM PEAK HOUR PHF: 0.86												AM	PM PEAK HOUR PHF: 0.83										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	0	0	0	96	0	166	229	342	0	0	1,150	524	2,507	0	0	0	347	0	218	203	463	0	0	382	165	1,778
Existing (2013)[1]	0	0	0	98	0	169	233	348	0	0	1,171	533	2,552	0	0	0	347	0	218	203	463	0	0	382	165	1,778

3: I-605 SB Off-Ramp / Arrow Hwy.

	AM PEAK HOUR PHF: 0.87												AM	PM PEAK HOUR PHF: 0.88										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	0	0	0	377	0	424	0	418	0	0	1,247	0	2,466	0	0	0	271	0	230	0	800	0	0	320	0	1,621
Existing (2013)[1]	0	0	0	384	0	432	0	426	0	0	1,269	0	2,511	0	0	0	271	0	230	0	800	0	0	320	0	1,621

4: I-605 NB On-Ramp/Live Oak Ln. / Arrow Hwy.

	AM PEAK HOUR PHF: 0.95												AM	PM PEAK HOUR PHF: 0.95										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	0	0	42	0	0	0	0	478	0	0	1,289	386	2,195	0	0	24	0	0	0	0	915	0	0	324	293	1,556
Vol. Adjustment[2]									73		-42	42	73									33		-4	4	33
2011 Flow Conserved	0	0	42	0	0	0	0	478	73	0	1,247	428	2,268	0	0	24	0	0	0	0	915	33	0	320	297	1,589
Existing (2013)[1]	0	0	43	0	0	0	0	487	74	0	1,269	436	2,309	0	0	24	0	0	0	0	915	33	0	320	297	1,589

5: Arrow Hwy. / Rivergrade Rd.

	AM PEAK HOUR PHF: 0.94												AM	PM PEAK HOUR PHF: 0.91										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	19	1,540	0	0	299	208	163	0	1	0	0	0	2,230	0	446	0	0	804	143	154	0	14	0	0	0	1,561
Vol. Adjustment[2]																		8								8
2011 Flow Conserved	19	1,540	0	0	299	208	163	0	1	0	0	0	2,230	0	446	0	0	812	143	154	0	14	0	0	0	1,569
Existing (2013)[1]	19	1,568	0	0	304	212	166	0	1	0	0	0	2,270	0	446	0	0	812	143	154	0	14	0	0	0	1,569

Existing Volume Summary

6: Stewart Av. / Rivergrade Rd.

	AM PEAK HOUR PHF: 0.92												AM	PM PEAK HOUR PHF: 0.81										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	3	2	96	2	0	1	7	62	9	112	130	9	433	7	0	73	6	10	20	0	82	16	85	33	2	334
Existing (2013)[1]	3	2	98	2	0	1	7	63	9	114	132	9	440	7	0	73	6	10	20	0	82	16	85	33	2	334

7: I-605 SB On-Ramp / Live Oak Av.

	AM PEAK HOUR PHF: 0.94												AM	PM PEAK HOUR PHF: 0.95										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	0	0	0	0	0	0	0	233	557	789	1,187	0	2,766	0	0	0	0	0	0	0	911	939	607	875	0	3,332
Vol. Adjustment[2]								40			99		139								-7	7				
2011 Flow Conserved	0	0	0	0	0	0	0	273	557	789	1,286	0	2,905	0	0	0	0	0	0	0	904	946	607	875	0	3,332
Existing (2013)[1]	0	0	0	0	0	0	0	278	567	803	1,309	0	2,957	0	0	0	0	0	0	0	904	946	607	875	0	3,332

8: I-605 NB Off-Ramp / Live Oak Av.

	AM PEAK HOUR PHF: 0.94												AM	PM PEAK HOUR PHF: 0.97										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	0	0	612	0	0	580	0	273	0	0	1,376	0	2,841	0	0	687	0	0	558	0	904	0	0	881	0	3,030
Vol. Adjustment[2]											119		119			4			2					41		47
2011 Flow Conserved	0	0	612	0	0	580	0	273	0	0	1,495	0	2,960	0	0	691	0	0	560	0	904	0	0	922	0	3,077
Existing (2013)[1]	0	0	623	0	0	590	0	278	0	0	1,522	0	3,013	0	0	691	0	0	560	0	904	0	0	922	0	3,077

9: Graham Access Rd. / Live Oak Av.

	AM PEAK HOUR PHF: 0.95												AM	PM PEAK HOUR PHF: 0.95										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	108	0	35	0	0	0	0	711	83	25	1,387	0	2,349	7	0	15	0	0	0	0	1,576	19	0	915	0	2,532
Vol. Adjustment[2]			9					91					100													
2011 Flow Conserved	108	0	44	0	0	0	0	802	83	25	1,387	0	2,449	7	0	15	0	0	0	0	1,576	19	0	915	0	2,532
Existing (2013)[1]	110	0	45	0	0	0	0	816	84	25	1,412	0	2,492	7	0	15	0	0	0	0	1,576	19	0	915	0	2,532

10: Live Oak Ln. / Live Oak Av.

	AM PEAK HOUR PHF: 0.96												AM	PM PEAK HOUR PHF: 0.92										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	0	0	0	2	0	95	71	775	0	0	1,183	24	2,150	0	0	0	5	0	51	22	1,558	0	0	867	3	2,506
Vol. Adjustment[2]											134		134				3		-3	7	4					11
2011 Flow Conserved	0	0	0	2	0	95	71	775	0	0	1,317	24	2,284	0	0	0	8	0	48	29	1,562	0	0	867	3	2,517
Existing (2013)[1]	0	0	0	2	0	97	72	789	0	0	1,341	24	2,325	0	0	0	8	0	48	29	1,562	0	0	867	3	2,517

Existing Volume Summary

11: Rivergrade Rd. / Live Oak Av.

	AM PEAK HOUR PHF: 0.90												AM	PM PEAK HOUR PHF: 0.90										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	26	34	150	9	58	20	41	668	52	216	1,145	3	2,422	89	58	372	0	11	28	11	1,542	17	69	756	11	2,964
Vol. Adjustment[2]									16		150		166											-3	3	
2011 Flow Conserved	26	34	150	9	58	20	41	668	68	216	1,295	3	2,588	89	58	372	0	11	28	11	1,542	17	69	753	14	2,964
Existing (2013)[1]	26	35	153	9	59	20	42	680	69	220	1,318	3	2,634	89	58	372	0	11	28	11	1,542	17	69	753	14	2,964

12: Stewart Av. / Live Oak Av.

	AM PEAK HOUR PHF: 0.93												AM	PM PEAK HOUR PHF: 0.93										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	19	78	22	8	20	79	12	592	37	30	1,462	17	2,376	50	28	19	36	71	17	46	1,934	186	41	708	11	3,147
Existing (2013)[1]	19	79	22	8	20	80	12	603	38	31	1,488	17	2,417	50	28	19	36	71	17	46	1,934	186	41	708	11	3,147

13: Baldwin Park Bl. / Live Oak Av.

	AM PEAK HOUR PHF: 0.92												AM	PM PEAK HOUR PHF: 0.92										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	202	0	163	0	0	0	0	583	55	120	1,365	0	2,488	77	0	116	0	0	0	0	1,642	361	223	678	0	3,097
Existing (2013)[1]	206	0	166	0	0	0	0	593	56	122	1,390	0	2,533	77	0	116	0	0	0	0	1,642	361	223	678	0	3,097

14: Arrow Hwy. / Live Oak Av.

	AM PEAK HOUR PHF: 0.97												AM	PM PEAK HOUR PHF: 0.92										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	0	0	0	240	0	46	69	634	0	0	1,395	1,295	3,679	0	0	0	718	0	108	41	1,738	0	0	796	379	3,780
Vol. Adjustment[2]						14					30	195	239											-3	26	23
2011 Flow Conserved	0	0	0	240	0	60	69	634	0	0	1,425	1,490	3,918	0	0	0	718	0	108	41	1,738	0	0	793	405	3,803
Existing (2013)[1]	0	0	0	244	0	61	70	645	0	0	1,451	1,517	3,988	0	0	0	718	0	108	41	1,738	0	0	793	405	3,803

15: Maine Av. / Arrow Hwy.

	AM PEAK HOUR PHF: 0.93												AM	PM PEAK HOUR PHF: 0.93										PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	555	0	73	0	0	0	0	802	126	76	2,346	0	3,978	216	0	92	0	0	0	0	2,088	345	68	942	0	3,751
Vol. Adjustment[2]											14		14											40		40
2011 Flow Conserved	555	0	73	0	0	0	0	802	126	76	2,360	0	3,992	216	0	92	0	0	0	0	2,088	345	68	982	0	3,791
Existing (2013)[1]	565	0	74	0	0	0	0	816	128	77	2,402	0	4,062	216	0	92	0	0	0	0	2,088	345	68	982	0	3,791

Existing Volume Summary

16: Arrow Hwy. / Dwy. 1

	AM PEAK HOUR PHF: 0.95												AM	PM PEAK HOUR PHF: 0.95											PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vol. Adjustment[2]		1,559			300								1,859		446			826								1,272
2011 Flow Conserved	0	1,559	0	0	300	0	0	0	0	0	0	0	1,859	0	446	0	0	826	0	0	0	0	0	0	0	1,272
Existing (2013)[1]	0	1,587	0	0	305	0	0	0	0	0	0	0	1,892	0	446	0	0	826	0	0	0	0	0	0	0	1,272

17: Arrow Hwy. / Dwy. 2

	AM PEAK HOUR PHF: 0.95												AM	PM PEAK HOUR PHF: 0.95											PM
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
2011 Raw Counts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vol. Adjustment[2]		1,559			300								1,859		446			826								1,272
2011 Flow Conserved	0	1,559	0	0	300	0	0	0	0	0	0	0	1,859	0	446	0	0	826	0	0	0	0	0	0	0	1,272
Existing (2013)[1]	0	1,587	0	0	305	0	0	0	0	0	0	0	1,892	0	446	0	0	826	0	0	0	0	0	0	0	1,272

[1] Existing (2013) = "2011 Flow Conserved" * 2013 Growth Factor

2013 Growth Factor: AM = 1.018; PM = 1.00; See attached 2013 vs 2012 Comparison Table

[2] Closely spaced intersections were adjusted for Flow Conservation. See Flow Conservation Sheet

2013 vs 2011 PEAK HOUR DATA COMPARISONS

ID	SEGMENT LOCATION	AM			PM		
		IN	OUT	TOTAL	IN	OUT	TOTAL
	ARROW HIGHWAY						
	West of Live Oak Av.						
	Tube Counts 2013	1,103	2,356	3,459	2,089	1,181	3,270
A	Peak Hour 2011 - (Live Oak Av. / Arrow #1)	1,037	2,155	3,192	2,193	1,205	3,398
	Delta	66	201	267	-104	-24	-128
	%	6%	9%	8%	-5%	-2%	-4%
	Between Avenida Barbosa & I-605						
	Tube Counts 2013	1,918	434	2,352	532	916	1,448
B	Peak Hour 2011 - (Avenida Barbosa / Arrow #2)	1,674	438	2,112	547	810	1,357
	Delta	244	-4	240	-15	106	91
	%	15%	-1%	11%	-3%	13%	7%
	East of Live Oak Ln.						
	Tube Counts 2013	1,890	570	2,460	626	999	1,625
C	Peak Hour 2011 - (I-605 NB/Live Oak Ln. / Arrow #4)	1,675	520	2,195	617	939	1,556
	Delta	215	50	265	9	60	69
	%	13%	10%	12%	1%	6%	4%
	South of Rivergrade Rd.						
	Tube Counts 2013	1,746	351	2,097	473	905	1,378
D	Peak Hour 2011 - (Arrow / Rivergrade #5)	1,559	300	1,859	446	826	1,272
	Delta	187	51	238	27	79	106
	%	12%	17%	13%	6%	10%	8%
	East of Live Oak Av.						
	Tube Counts 2013	1,983	851	2,834	1,048	2,013	3,061
E	Peak Hour 2011 - (Maine / Arrow #15)	2,436	875	3,311	1,050	2,180	3,230
	Delta	-453	-24	-477	-2	-167	-169
	%	-19%	-3%	-14%	0%	-8%	-5%
	LIVE OAK AVENUE						
	Between Arrow Hwy. & I-605						
	Tube Counts 2013	1,086	1,009	2,095	742	1,762	2,504
F	Peak Hour 2011 - (Live Oak Av. / Arrow #1)	1,189	793	1,982	864	1,843	2,707
	Delta	-103	216	113	-122	-81	-203
	%	-9%	27%	6%	-14%	-4%	-7%
	East of Graham Access Rd.						
	Tube Counts 2013	1,372	663	2,035	864	1,416	2,280
G	Peak Hour 2011 - (Graham / Live Oak Av. #9)	1,412	846	2,258	915	1,591	2,506
	Delta	-40	-183	-223	-51	-175	-226
	%	-3%	-22%	-10%	-6%	-11%	-9%
	Between Rivergrade Rd. & Arrow Hwy.						
	Tube Counts 2013	1,086	1,009	2,095	742	1,762	2,504
H	Peak Hour 2011 - (Rivergrade / Live Oak Av. #11)	1,514	827	2,341	836	1,914	2,750
	Delta	-428	182	-246	-94	-152	-246
	%	-28%	22%	-11%	-11%	-8%	-9%

2013 vs 2011 PEAK HOUR DATA COMPARISONS

ID	SEGMENT LOCATION	AM			PM		
		IN	OUT	TOTAL	IN	OUT	TOTAL
	LIVE OAK AVENUE (Cont...)						
	East of Baldwin Park Bl.						
	Tube Counts 2013	1,404	878	2,282	901	1,494	2,395
I	Peak Hour 2011 - (Baldwin Park / Live Oak Av. #13)	1,485	746	2,231	901	1,758	2,659
	Delta	-81	132	51	0	-264	-264
	%	-5%	18%	2%	0%	-15%	-10%
	AVENIDA BARBOSA						
	North of Arrow Hwy.						
	Tube Counts 2013	231	875	1,106	658	338	996
J	Peak Hour 2011 - (Avenida Barbosa / Arrow Hwy. #2)	262	753	1,015	565	368	933
	Delta	-31	122	91	93	-30	63
	%	-12%	16%	9%	16%	-8%	7%
	RIVERGRADE ROAD						
	West of Arrow Highway						
	Tube Counts 2013	184	212	396	165	135	300
K	Peak Hour 2011 - (Arrow / Rivergrade #5)	164	227	391	168	143	311
	Delta	20	-15	5	-3	-8	-11
	%	12%	-7%	1%	-2%	-6%	-4%
	BALDWIN PARK BOULEVARD						
	South of Live Oak Av.						
	Tube Counts 2013	449	178	627	192	564	756
L	Peak Hour 2011 - (Baldwin Park / Live Oak Av. #13)	365	175	540	193	584	777
	Delta	84	3	87	-1	-20	-21
	%	23%	2%	16%	-1%	-3%	-3%

DATA SET	AM			PM		
	IN	OUT	TOTAL	IN	OUT	TOTAL
TUBE COUNTS (2013) TOTAL	14,452	9,386	23,838	9,032	13,485	22,517
PEAK HOUR 2011 TOTAL	14,772	8,655	23,427	9,295	14,161	23,456
Delta	-320	731	411	-263	-676	-939
%	-2.20%	8.40%	1.80%	-2.80%	-4.80%	-4.00%
PEAK HOUR ADJUSTMENT FACTOR FOR 2011 INTERSECTION DATABASE	1.018			N/A		

= Higher Data Set

EXISTING (2011) PCE FLOW CONSERVATION

I-605 SB Off-Ramp (NS) / Arrow Hwy. (EW)

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NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-001 Class

Location: Live Oak Ave & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	2	1	0	0	0	0	1.5	1.5	2	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:30	CARS		246	0	29	0	0	0	0	71	146	13	279	0
	2-Axle Trucks		5	0	0	0	0	0	0	1	1	0	6	0
	3-Axle Trucks		7	0	8	0	0	0	0	7	3	3	5	0
	4-Axle Trucks+		2	0	0	0	0	0	0	1	2	1	0	0
7:45	CARS		200	0	43	0	0	0	0	93	160	14	279	0
	2-Axle Trucks		6	0	1	0	0	0	0	1	6	1	0	0
	3-Axle Trucks		6	0	5	0	0	0	0	7	4	11	6	0
	4-Axle Trucks+		5	0	0	0	0	0	0	0	1	1	1	0
8:00	CARS		205	0	32	0	0	0	0	73	149	10	218	0
	2-Axle Trucks		5	0	1	0	0	0	0	1	4	2	5	0
	3-Axle Trucks		4	0	7	0	0	0	0	6	5	8	4	0
	4-Axle Trucks+		2	0	1	0	0	0	0	4	6	1	3	0
8:15	CARS		215	0	26	0	0	0	0	79	166	7	193	0
	2-Axle Trucks		3	0	2	0	0	0	0	2	6	0	1	0
	3-Axle Trucks		1	0	4	0	0	0	0	9	4	10	8	0
	4-Axle Trucks+		2	0	1	0	0	0	0	1	5	5	1	0
8:30	CARS		174	0	19	0	0	0	0	65	146	19	158	0
	2-Axle Trucks		9	0	1	0	0	0	0	3	5	0	1	0
	3-Axle Trucks		6	0	3	0	0	0	0	8	3	5	3	0
	4-Axle Trucks+		4	0	1	0	0	0	0	1	1	1	0	0
8:45	CARS		155	0	27	0	0	0	0	53	136	16	139	0
	2-Axle Trucks		6	0	1	0	0	0	0	3	7	0	1	0
	3-Axle Trucks		10	0	5	0	0	0	0	9	7	3	5	0
	4-Axle Trucks+		4	0	1	0	0	0	0	2	8	4	0	0
9:00	CARS		0	0	0	0	0	0	0	0	0	0	0	0
	Other Trucks		0	0	0	0	0	0	0	0	0	0	0	0
	Bobtails		0	0	0	0	0	0	0	0	0	0	0	0
	Chassis		0	0	0	0	0	0	0	0	0	0	0	0
9:15	CARS		0	0	0	0	0	0	0	0	0	0	0	0
	Other Trucks		0	0	0	0	0	0	0	0	0	0	0	0
	Bobtails		0	0	0	0	0	0	0	0	0	0	0	0
	Chassis		0	0	0	0	0	0	0	0	0	0	0	0

MOVEMENT TOTALS

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
CARS	1614	0	224	0	0	0	0	524	1133	103	1827	0
2-Axle Trucks	36	0	7	0	0	0	0	14	38	4	21	0
3-Axle Trucks	48	0	49	0	0	0	0	58	38	47	38	0
4-Axle Trucks+	25	0	8	0	0	0	0	9	30	16	7	0
TOTALS	1723	0	288	0	0	0	0	605	1239	170	1893	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	929	0	166	0	0	0	0	321	621	84	1133	0
PEAK HR. FACTOR:		0.922			0.000			0.866			0.879	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-001 Class

Location: Live Oak Ave & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	2	1	0	0	0	0	1.5	1.5	2	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		114	0	17	0	0	0	0	108	273	23	93	0
	2-Axle Trucks		2	0	2	0	0	0	0	2	4	2	4	0
	3-Axle Trucks		11	0	4	0	0	0	0	1	3	1	5	0
	4-Axle Trucks+		6	0	1	0	0	0	0	1	2	0	1	0
16:15	CARS		129	0	16	0	0	0	0	145	295	25	80	0
	2-Axle Trucks		6	0	1	0	0	0	0	3	5	1	5	0
	3-Axle Trucks		3	0	5	0	0	0	0	0	9	0	2	0
	4-Axle Trucks+		1	0	2	0	0	0	0	1	2	1	2	0
16:30	CARS		142	0	13	0	0	0	0	113	314	25	99	0
	2-Axle Trucks		7	0	2	0	0	0	0	2	6	1	4	0
	3-Axle Trucks		7	0	2	0	0	0	0	0	6	1	1	0
	4-Axle Trucks+		1	0	1	0	0	0	0	2	0	0	4	0
16:45	CARS		147	0	15	0	0	0	0	103	320	32	79	0
	2-Axle Trucks		4	0	1	0	0	0	0	3	10	1	2	0
	3-Axle Trucks		2	0	2	0	0	0	0	2	11	1	4	0
	4-Axle Trucks+		1	0	1	0	0	0	0	1	2	2	2	0
17:00	CARS		147	0	15	0	0	0	0	140	386	46	114	0
	2-Axle Trucks		1	0	1	0	0	0	0	0	9	1	1	0
	3-Axle Trucks		4	0	3	0	0	0	0	3	2	1	4	0
	4-Axle Trucks+		1	0	2	0	0	0	0	2	2	4	2	0
17:15	CARS		175	0	18	0	0	0	0	120	419	43	104	0
	2-Axle Trucks		1	0	0	0	0	0	0	1	10	0	1	0
	3-Axle Trucks		2	0	1	0	0	0	0	1	1	3	2	0
	4-Axle Trucks+		7	0	1	0	0	0	0	1	2	2	1	0
17:30	CARS		169	0	16	0	0	0	0	130	388	34	106	0
	2-Axle Trucks		4	0	0	0	0	0	0	0	13	1	2	0
	3-Axle Trucks		2	0	1	0	0	0	0	0	1	0	0	0
	4-Axle Trucks		1	0	2	0	0	0	0	0	2	1	0	0
17:45	CARS		183	0	18	0	0	0	0	130	371	26	90	0
	2-Axle Trucks		0	0	0	0	0	0	0	1	5	0	0	0
	3-Axle Trucks		3	0	4	0	0	0	0	0	2	0	1	0
	4-Axle Trucks		10	0	0	0	0	0	0	0	1	3	0	0

MOVEMENT TOTALS

CARS	1206	0	128	0	0	0	0	989	2766	254	765	0
2-Axle Trucks	25	0	7	0	0	0	0	12	62	7	19	0
3-Axle Trucks	34	0	22	0	0	0	0	7	35	7	19	0
4-Axle Trucks+	28	0	10	0	0	0	0	8	13	13	12	0
TOTALS	1293	0	167	0	0	0	0	1016	2876	281	815	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1700 PM

PEAK VOLUMES =	710	0	82	0	0	0	0	529	1614	165	428	0
PEAK HR. FACTOR:		0.908			0.000			0.965			0.857	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-002 Class

Location: Avenida Barbosa St & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	0	0	2	0	1	1	2	0	0	2	1
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		0	0	0	14	0	17	25	39	0	0	238	76
	2-Axle Trucks		0	0	0	1	0	1	1	3	0	0	4	2
	3-Axle Trucks		0	0	0	0	0	6	8	5	0	0	5	2
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	2	0
7:15	CARS		0	0	0	18	0	26	31	48	0	0	321	138
	2-Axle Trucks		0	0	0	1	0	2	0	1	0	0	4	2
	3-Axle Trucks		0	0	0	1	0	8	7	7	0	0	4	0
	4-Axle Trucks+		0	0	0	0	0	1	0	3	0	0	1	0
7:30	CARS		0	0	0	22	0	20	35	60	0	0	272	115
	2-Axle Trucks		0	0	0	1	0	1	0	1	0	0	3	0
	3-Axle Trucks		0	0	0	1	0	6	11	12	0	0	4	3
	4-Axle Trucks+		0	0	0	0	0	0	1	0	0	0	0	0
7:45	CARS		0	0	0	23	0	30	67	56	0	0	266	146
	2-Axle Trucks		0	0	0	1	0	2	1	4	0	0	2	1
	3-Axle Trucks		0	0	0	4	0	7	1	12	0	0	7	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	0	0	2	1
8:00	CARS		0	0	0	16	0	19	51	55	0	0	208	106
	2-Axle Trucks		0	0	0	0	0	1	0	2	0	0	1	2
	3-Axle Trucks		0	0	0	0	0	4	1	14	0	0	7	1
	4-Axle Trucks+		0	0	0	0	0	3	0	3	0	0	5	0
8:15	CARS		0	0	0	32	0	21	55	54	0	0	158	95
	2-Axle Trucks		0	0	0	2	0	1	2	1	0	0	1	4
	3-Axle Trucks		0	0	0	0	0	7	1	8	0	0	8	1
	4-Axle Trucks+		0	0	0	1	0	1	1	1	0	0	4	0
8:30	CARS		0	0	0	22	0	22	41	45	0	0	160	83
	2-Axle Trucks		0	0	0	1	0	0	0	2	0	0	2	2
	3-Axle Trucks		0	0	0	1	0	4	0	8	0	0	3	0
	4-Axle Trucks+		0	0	0	0	0	0	1	1	0	0	1	1
8:45	CARS		0	0	0	21	0	29	45	41	0	0	123	73
	2-Axle Trucks		0	0	0	2	0	0	2	0	0	0	2	0
	3-Axle Trucks		0	0	0	1	0	4	8	4	0	0	2	3
	4-Axle Trucks+		0	0	0	0	0	2	0	3	0	0	1	0

MOVEMENT TOTALS

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
CARS	0	0	0	168	0	184	350	398	0	0	1746	832
2-Axle Trucks	0	0	0	9	0	8	6	14	0	0	19	13
3-Axle Trucks	0	0	0	8	0	46	37	70	0	0	40	10
4-Axle Trucks+	0	0	0	1	0	7	3	14	0	0	16	2
TOTALS	0	0	0	186	0	245	396	496	0	0	1821	857
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	0	0	0	88	0	130	206	279	0	0	1107	515
PEAK HR. FACTOR:		0.000			0.813			0.854			0.863	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-002 Class

Location: Avenida Barbosa St & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	0	0	2	0	1	1	2	0	0	2	1
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0	0	0	65	0	46	36	87	0	0	73	37
	2-Axle Trucks		0	0	0	0	0	2	3	0	0	0	9	1
	3-Axle Trucks		0	0	0	2	0	3	3	1	0	0	2	1
	4-Axle Trucks+		0	0	0	0	0	0	0	1	0	0	1	0
16:15	CARS		0	0	0	77	0	31	38	119	0	0	75	35
	2-Axle Trucks		0	0	0	3	0	2	2	1	0	0	3	3
	3-Axle Trucks		0	0	0	0	0	2	9	0	0	0	1	1
	4-Axle Trucks+		0	0	0	2	0	1	1	2	0	0	3	0
16:30	CARS		0	0	0	72	0	40	43	92	0	0	78	41
	2-Axle Trucks		0	0	0	1	0	1	1	3	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	3	2	1	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	4	0
16:45	CARS		0	0	0	73	0	42	32	87	0	0	76	28
	2-Axle Trucks		0	0	0	1	0	0	3	1	0	0	3	1
	3-Axle Trucks		0	0	0	3	0	2	2	2	0	0	1	1
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	3	0
17:00	CARS		0	0	0	101	0	77	44	113	0	0	89	44
	2-Axle Trucks		0	0	0	1	0	0	1	0	0	0	0	2
	3-Axle Trucks		0	0	0	0	0	3	3	1	0	0	2	2
	4-Axle Trucks+		0	0	0	1	0	0	0	6	0	0	5	0
17:15	CARS		0	0	0	77	0	63	33	102	0	0	84	39
	2-Axle Trucks		0	0	0	2	0	0	1	1	0	0	1	1
	3-Axle Trucks		0	0	0	1	0	4	1	0	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	3	0	0	3	0
17:30	CARS		0	0	0	75	0	50	35	106	0	0	79	42
	2-Axle Trucks		0	0	0	0	0	0	1	0	0	0	2	2
	3-Axle Trucks		0	0	0	1	0	0	1	0	0	0	0	1
	4-Axle Trucks		0	0	0	0	0	0	0	0	0	0	1	0
17:45	CARS		0	0	0	61	0	44	45	108	0	0	71	12
	2-Axle Trucks		0	0	0	1	0	0	0	1	0	0	0	0
	3-Axle Trucks		0	0	0	0	0	0	3	0	0	0	2	1
	4-Axle Trucks		0	0	0	0	0	0	0	1	0	0	4	0

MOVEMENT TOTALS

CARS	0	0	0	601	0	393	306	814	0	0	625	278
2-Axle Trucks	0	0	0	9	0	5	12	7	0	0	19	10
3-Axle Trucks	0	0	0	7	0	17	24	5	0	0	9	7
4-Axle Trucks+	0	0	0	3	0	1	1	17	0	0	24	0
TOTALS	0	0	0	620	0	416	343	843	0	0	677	295
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1645 PM

PEAK VOLUMES =	0	0	0	336	0	241	157	424	0	0	350	163
PEAK HR. FACTOR:		0.000			0.788			0.865			0.891	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-003 Class

Location: I-605 SB Off-Ramp & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: No Control

		LANES:	0	0	0	1	0	1	0	3	0	0	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		0	0	0	51	0	64	0	55	0	0	265	0
	2-Axle Trucks		0	0	0	1	0	0	0	3	0	0	4	0
	3-Axle Trucks		0	0	0	6	0	7	0	8	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	1	0	1	0	0	0	0
7:15	CARS		0	0	0	62	0	81	0	57	0	0	367	0
	2-Axle Trucks		0	0	0	2	0	1	0	2	0	0	6	0
	3-Axle Trucks		0	0	0	7	0	3	0	8	0	0	2	0
	4-Axle Trucks+		0	0	0	1	0	1	0	0	0	0	0	0
7:30	CARS		0	0	0	73	0	94	0	85	0	0	305	0
	2-Axle Trucks		0	0	0	1	0	1	0	2	0	0	1	0
	3-Axle Trucks		0	0	0	3	0	4	0	7	0	0	3	0
	4-Axle Trucks+		0	0	0	1	0	0	0	1	0	0	0	0
7:45	CARS		0	0	0	103	0	98	0	78	0	0	313	0
	2-Axle Trucks		0	0	0	1	0	1	0	5	0	0	1	0
	3-Axle Trucks		0	0	0	4	0	5	0	15	0	0	5	0
	4-Axle Trucks+		0	0	0	1	0	1	0	2	0	0	0	0
8:00	CARS		0	0	0	86	0	96	0	76	0	0	210	0
	2-Axle Trucks		0	0	0	1	0	3	0	2	0	0	3	0
	3-Axle Trucks		0	0	0	4	0	2	0	12	0	0	3	0
	4-Axle Trucks+		0	0	0	0	0	4	0	4	0	0	3	0
8:15	CARS		0	0	0	77	0	67	0	79	0	0	193	0
	2-Axle Trucks		0	0	0	2	0	1	0	3	0	0	5	0
	3-Axle Trucks		0	0	0	8	0	6	0	8	0	0	2	0
	4-Axle Trucks+		0	0	0	2	0	1	0	5	0	0	3	0
8:30	CARS		0	0	0	58	0	76	0	69	0	0	159	0
	2-Axle Trucks		0	0	0	2	0	1	0	2	0	0	2	0
	3-Axle Trucks		0	0	0	7	0	2	0	13	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	1	0	1	0	0	1	0
8:45	CARS		0	0	0	60	0	56	0	65	0	0	145	0
	2-Axle Trucks		0	0	0	2	0	0	0	3	0	0	2	0
	3-Axle Trucks		0	0	0	7	0	4	0	7	0	0	1	0
	4-Axle Trucks+		0	0	0	1	0	1	0	1	0	0	0	0

MOVEMENT TOTALS

CARS	0	0	0	570	0	632	0	564	0	0	1957	0
2-Axle Trucks	0	0	0	12	0	8	0	22	0	0	24	0
3-Axle Trucks	0	0	0	46	0	33	0	78	0	0	18	0
4-Axle Trucks+	0	0	0	6	0	10	0	15	0	0	7	0
TOTALS	0	0	0	634	0	683	0	679	0	0	2006	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	0	0	0	350	0	395	0	356	0	0	1222	0
PEAK HR. FACTOR:		0.000			0.870			0.890			0.815	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-003 Class

Location: I-605 SB Off-Ramp & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: No Control

		LANES:	0	0	0	1	0	1	0	3	0	0	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0	0	0	54	0	41	0	152	0	0	67	0
	2-Axle Trucks		0	0	0	2	0	0	0	2	0	0	7	0
	3-Axle Trucks		0	0	0	3	0	2	0	4	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	2	0	0	0	0	1	0
16:15	CARS		0	0	0	66	0	50	0	184	0	0	62	0
	2-Axle Trucks		0	0	0	2	0	0	0	2	0	0	5	0
	3-Axle Trucks		0	0	0	3	0	3	0	0	0	0	0	0
	4-Axle Trucks+		0	0	0	2	0	1	0	5	0	0	1	0
16:30	CARS		0	0	0	59	0	34	0	169	0	0	85	0
	2-Axle Trucks		0	0	0	1	0	2	0	4	0	0	0	0
	3-Axle Trucks		0	0	0	1	0	2	0	0	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	3	0	2	0	0	0	0
16:45	CARS		0	0	0	52	0	37	0	162	0	0	61	0
	2-Axle Trucks		0	0	0	0	0	2	0	4	0	0	2	0
	3-Axle Trucks		0	0	0	3	0	1	0	4	0	0	0	0
	4-Axle Trucks+		0	0	0	1	0	4	0	3	0	0	1	0
17:00	CARS		0	0	0	60	0	52	0	210	0	0	87	0
	2-Axle Trucks		0	0	0	2	0	1	0	0	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	2	0	2	0	0	1	0
	4-Axle Trucks+		0	0	0	1	0	3	0	6	0	0	1	0
17:15	CARS		0	0	0	49	0	49	0	187	0	0	76	0
	2-Axle Trucks		0	0	0	0	0	1	0	2	0	0	0	0
	3-Axle Trucks		0	0	0	1	0	1	0	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	3	0	3	0	0	0	0
17:30	CARS		0	0	0	50	0	57	0	166	0	0	62	0
	2-Axle Trucks		0	0	0	0	0	2	0	0	0	0	2	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	2	0
	4-Axle Trucks		0	0	0	0	0	2	0	0	0	0	0	0
17:45	CARS		0	0	0	55	0	59	0	180	0	0	28	0
	2-Axle Trucks		0	0	0	2	0	1	0	1	0	0	0	0
	3-Axle Trucks		0	0	0	1	0	1	0	0	0	0	0	0
	4-Axle Trucks		0	0	0	0	0	2	0	1	0	0	0	0

MOVEMENT TOTALS

CARS	0	0	0	445	0	379	0	1410	0	0	528	0
2-Axle Trucks	0	0	0	9	0	9	0	15	0	0	17	0
3-Axle Trucks	0	0	0	12	0	12	0	11	0	0	5	0
4-Axle Trucks+	0	0	0	4	0	20	0	20	0	0	4	0
TOTALS	0	0	0	470	0	420	0	1456	0	0	554	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1615 PM

PEAK VOLUMES =	0	0	0	253	0	197	0	757	0	0	308	0
PEAK HR. FACTOR:		0.000			0.886			0.868			0.856	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-004 Class

Location: i-605 NB On-Ramp & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: No Control

		LANES:	0	1	0	0	0	0	0	2	1	0	2	1
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		0	0	5	0	0	0	0	78	38	0	261	85
	2-Axle Trucks		0	0	3	0	0	0	0	4	0	0	6	1
	3-Axle Trucks		0	0	2	0	0	0	0	4	4	0	1	2
	4-Axle Trucks+		0	0	0	0	0	0	0	1	3	0	0	0
7:15	CARS		0	0	3	0	0	0	0	90	20	0	362	90
	2-Axle Trucks		0	0	1	0	0	0	0	3	3	0	5	3
	3-Axle Trucks		0	0	2	0	0	0	0	2	12	0	1	3
	4-Axle Trucks+		0	0	0	0	0	0	0	2	1	0	2	1
7:30	CARS		0	0	9	0	0	0	0	113	43	0	308	100
	2-Axle Trucks		0	0	1	0	0	0	0	0	1	0	0	4
	3-Axle Trucks		0	0	2	0	0	0	0	0	12	0	2	3
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	0	0
7:45	CARS		0	0	1	0	0	0	0	144	43	0	313	71
	2-Axle Trucks		0	0	0	0	0	0	0	3	0	0	2	2
	3-Axle Trucks		0	0	2	0	0	0	0	4	10	0	4	3
	4-Axle Trucks+		0	0	0	0	0	0	0	1	2	0	1	0
8:00	CARS		0	0	3	0	0	0	0	127	42	0	205	57
	2-Axle Trucks		0	0	0	0	0	0	0	2	0	0	4	3
	3-Axle Trucks		0	0	2	0	0	0	0	2	12	0	4	2
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	2	0
8:15	CARS		0	0	7	0	0	0	0	121	31	0	197	63
	2-Axle Trucks		0	0	0	0	0	0	0	7	0	0	4	1
	3-Axle Trucks		0	0	1	0	0	0	0	10	14	0	4	1
	4-Axle Trucks+		0	0	0	0	0	0	0	1	2	0	1	0
8:30	CARS		0	0	9	0	0	0	0	81	32	0	158	68
	2-Axle Trucks		0	0	0	0	0	0	0	6	0	0	2	2
	3-Axle Trucks		0	0	2	0	0	0	0	14	12	0	1	1
	4-Axle Trucks+		0	0	0	0	0	0	0	2	1	0	1	0
8:45	CARS		0	0	2	0	0	0	0	101	28	0	147	67
	2-Axle Trucks		0	0	0	0	0	0	0	4	0	0	0	1
	3-Axle Trucks		0	0	1	0	0	0	0	6	6	0	1	1
	4-Axle Trucks+		0	0	0	0	0	0	0	0	1	0	0	1

MOVEMENT TOTALS

CARS	0	0	39	0	0	0	0	855	277	0	1951	601
2-Axle Trucks	0	0	5	0	0	0	0	29	4	0	23	17
3-Axle Trucks	0	0	14	0	0	0	0	42	82	0	18	16
4-Axle Trucks+	0	0	0	0	0	0	0	11	10	0	7	2
TOTALS	0	0	58	0	0	0	0	937	373	0	1999	636
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	0	0	31	0	0	0	0	451	192	0	1268	368
PEAK HR. FACTOR:		0.646			0.000			0.777			0.876	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-004 Class

Location: i-605 NB On-Ramp & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL:

LANES:

		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS	0	0	4	0	0	0	0	190	25	0	66	79
	2-Axle Trucks	0	0	1	0	0	0	0	2	0	0	6	2
	3-Axle Trucks	0	0	1	0	0	0	0	2	2	0	2	0
	4-Axle Trucks+	0	0	0	0	0	0	0	0	0	0	1	2
16:15	CARS	0	0	4	0	0	0	0	222	30	0	67	48
	2-Axle Trucks	0	0	0	0	0	0	0	3	0	0	2	0
	3-Axle Trucks	0	0	0	0	0	0	0	3	0	0	1	1
	4-Axle Trucks+	0	0	0	0	0	0	0	6	1	0	0	0
16:30	CARS	0	0	5	0	0	0	0	205	24	0	83	77
	2-Axle Trucks	0	0	1	0	0	0	0	1	1	0	2	1
	3-Axle Trucks	0	0	1	0	0	0	0	2	1	0	0	0
	4-Axle Trucks+	0	0	0	0	0	0	0	2	0	0	0	1
16:45	CARS	0	0	3	0	0	0	0	184	27	0	62	54
	2-Axle Trucks	0	0	0	0	0	0	0	2	0	0	2	0
	3-Axle Trucks	0	0	0	0	0	0	0	4	1	0	0	2
	4-Axle Trucks+	0	0	0	0	0	0	0	3	1	0	1	0
17:00	CARS	0	0	9	0	0	0	0	226	28	0	84	87
	2-Axle Trucks	0	0	0	0	0	0	0	2	0	0	1	0
	3-Axle Trucks	0	0	1	0	0	0	0	4	1	0	2	0
	4-Axle Trucks+	0	0	0	0	0	0	0	5	2	0	0	1
17:15	CARS	0	0	1	0	0	0	0	225	27	0	73	63
	2-Axle Trucks	0	0	0	0	0	0	0	3	0	0	1	0
	3-Axle Trucks	0	0	0	0	0	0	0	2	0	0	0	0
	4-Axle Trucks+	0	0	0	0	0	0	0	3	0	0	2	0
17:30	CARS	0	0	4	0	0	0	0	191	22	0	66	72
	2-Axle Trucks	0	0	0	0	0	0	0	2	0	0	2	0
	3-Axle Trucks	0	0	1	0	0	0	0	0	0	0	0	1
	4-Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	2
17:45	CARS	0	0	4	0	0	0	0	200	24	0	26	67
	2-Axle Trucks	0	0	0	0	0	0	0	9	0	0	1	0
	3-Axle Trucks	0	0	0	0	0	0	0	1	0	0	0	0
	4-Axle Trucks	0	0	0	0	0	0	0	1	0	0	0	2

MOVEMENT TOTALS

CARS	0	0	34	0	0	0	0	1643	207	0	527	547
2-Axle Trucks	0	0	2	0	0	0	0	24	1	0	17	3
3-Axle Trucks	0	0	4	0	0	0	0	18	5	0	5	4
4-Axle Trucks+	0	0	0	0	0	0	0	20	4	0	4	8
TOTALS	0	0	40	0	0	0	0	1705	217	0	553	562
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1630 PM

PEAK VOLUMES =	0	0	21	0	0	0	0	873	113	0	313	286
PEAK HR. FACTOR:		0.525			0.000			0.920			0.856	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-005 Class

Location: Arrow Hwy & Rivergrade Rd City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	1	2	0	0	2	1	2	0	1	0	0	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		4	327	0	0	54	36	27	0	1	0	0	0
	2-Axle Trucks		0	8	0	0	2	6	1	0	0	0	0	0
	3-Axle Trucks		0	1	0	0	0	2	2	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	0	0	0
7:15	CARS		2	423	0	0	56	38	33	0	0	0	0	0
	2-Axle Trucks		0	4	0	0	2	0	2	0	0	0	0	0
	3-Axle Trucks		0	2	0	0	3	2	3	0	0	0	0	0
	4-Axle Trucks+		0	1	0	0	1	0	0	0	0	0	0	0
7:30	CARS		4	393	0	0	70	54	39	0	0	0	0	0
	2-Axle Trucks		0	2	0	0	1	0	3	0	0	0	0	0
	3-Axle Trucks		0	2	0	0	1	1	4	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	0	0	0
7:45	CARS		9	353	0	0	94	57	33	0	0	0	0	0
	2-Axle Trucks		0	4	0	0	4	0	0	0	0	0	0	0
	3-Axle Trucks		0	2	0	0	0	2	2	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	0	0	0
8:00	CARS		1	226	0	0	79	49	26	0	2	0	0	0
	2-Axle Trucks		0	0	0	0	1	0	2	0	0	0	0	0
	3-Axle Trucks		0	1	0	0	1	0	2	0	0	0	0	0
	4-Axle Trucks+		0	2	0	0	1	0	0	0	0	0	0	0
8:15	CARS		2	237	0	0	73	60	23	0	0	0	0	0
	2-Axle Trucks		1	5	0	0	4	1	0	0	0	0	0	0
	3-Axle Trucks		0	1	0	0	2	2	3	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	1	1	1	0	0	0	0	0
8:30	CARS		2	207	0	0	49	37	14	0	0	0	0	0
	2-Axle Trucks		0	5	0	0	3	1	0	0	0	0	0	0
	3-Axle Trucks		0	0	0	0	4	1	1	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	1	1	1	0	0	0	0	0
8:45	CARS		3	176	0	0	66	52	31	0	1	0	0	0
	2-Axle Trucks		0	4	0	0	8	3	0	0	0	0	0	0
	3-Axle Trucks		0	1	0	0	2	2	1	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	0	0	0

MOVEMENT TOTALS

CARS	27	2342	0	0	541	383	226	0	4	0	0	0
2-Axle Trucks	1	32	0	0	25	11	8	0	0	0	0	0
3-Axle Trucks	0	10	0	0	13	12	18	0	0	0	0	0
4-Axle Trucks+	0	3	0	0	4	2	2	0	0	0	0	0
TOTALS	28	2387	0	0	583	408	254	0	4	0	0	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	19	1522	0	0	288	198	149	0	1	0	0	0
PEAK HR. FACTOR:		0.892			0.774			0.815			0.000	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-005 Class

Location: Arrow Hwy & Rivergrade Rd City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	1	2	0	0	2	1	2	0	1	0	0	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0	111	0	0	163	17	27	0	1	0	0	0
	2-Axle Trucks		1	2	0	0	1	0	0	0	0	0	0	0
	3-Axle Trucks		0	4	0	0	4	1	1	0	0	0	0	0
	4-Axle Trucks+		0	1	0	0	0	0	0	0	0	0	0	0
16:15	CARS		0	95	0	0	184	36	24	0	3	0	0	0
	2-Axle Trucks		0	3	0	0	4	0	0	0	0	0	0	0
	3-Axle Trucks		0	0	0	0	1	2	1	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	2	1	2	0	0	0	0	0
16:30	CARS		0	133	0	0	172	25	28	0	6	0	0	0
	2-Axle Trucks		0	3	0	0	4	1	0	0	0	0	0	0
	3-Axle Trucks		0	1	0	0	3	1	2	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	0	0	0
16:45	CARS		0	97	0	0	187	38	25	0	3	0	0	0
	2-Axle Trucks		0	1	0	0	1	0	1	0	0	0	0	0
	3-Axle Trucks		0	0	0	0	2	0	0	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	1	1	1	0	0	0	0	0
17:00	CARS		0	107	0	0	206	24	55	0	2	0	0	0
	2-Axle Trucks		0	1	0	0	4	0	0	0	0	0	0	0
	3-Axle Trucks		0	0	0	0	4	0	1	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	2	2	1	0	0	0	0	0
17:15	CARS		0	100	0	0	189	26	32	0	1	0	0	0
	2-Axle Trucks		3	0	0	0	2	0	2	0	0	0	0	0
	3-Axle Trucks		0	0	0	0	0	1	0	0	0	0	0	0
	4-Axle Trucks+		0	0	0	0	1	1	0	0	0	0	0	0
17:30	CARS		0	95	0	0	167	17	37	0	1	0	0	0
	2-Axle Trucks		1	2	0	0	1	0	0	0	0	0	0	0
	3-Axle Trucks		0	0	0	0	1	0	1	0	0	0	0	0
	4-Axle Trucks		0	1	0	0	2	0	1	0	0	0	0	0
17:45	CARS		0	77	0	0	165	18	26	0	0	0	0	0
	2-Axle Trucks		1	0	0	0	4	1	0	0	0	0	0	0
	3-Axle Trucks		0	0	0	0	0	0	1	0	0	0	0	0
	4-Axle Trucks		0	0	0	0	1	0	1	0	0	0	0	0

MOVEMENT TOTALS

CARS	0	815	0	0	1433	201	254	0	17	0	0	0
2-Axle Trucks	6	12	0	0	21	2	3	0	0	0	0	0
3-Axle Trucks	0	5	0	0	15	5	7	0	0	0	0	0
4-Axle Trucks+	0	2	0	0	9	5	6	0	0	0	0	0
TOTALS	6	834	0	0	1478	213	270	0	17	0	0	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1630 PM

PEAK VOLUMES =	3	443	0	0	778	131	148	0	14	0	0	0
PEAK HR. FACTOR:		0.814			0.938			0.678			0.000	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-006 Class

Location: Stewart Ave & Rivergrade Rd City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	1	1	0	0	1	0	1	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		0	1	26	0	0	1	3	1	0	28	11	2
	2-Axle Trucks		0	0	0	0	0	0	0	0	0	1	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	2	0	1	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	0	1	0
7:15	CARS		2	2	27	0	0	0	6	12	0	19	19	0
	2-Axle Trucks		0	0	0	0	0	0	0	2	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	0	1
	4-Axle Trucks+		0	0	0	0	0	0	1	2	1	0	0	0
7:30	CARS		0	0	33	0	0	0	1	7	0	29	17	1
	2-Axle Trucks		0	0	1	0	0	0	0	2	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	3	0	0	2	1
	4-Axle Trucks+		0	0	0	0	0	0	0	1	0	0	1	0
7:45	CARS		2	1	24	0	0	0	1	8	0	25	41	3
	2-Axle Trucks		0	0	0	0	0	0	0	0	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	1	0	0	0
8:00	CARS		0	1	18	0	0	1	1	7	0	23	19	2
	2-Axle Trucks		0	0	2	0	0	0	0	1	0	0	0	0
	3-Axle Trucks		0	0	1	1	0	0	0	3	0	0	2	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	0	0	0
8:15	CARS		1	0	14	0	0	0	-2	6	0	35	29	1
	2-Axle Trucks		0	0	0	0	0	0	0	0	0	0	2	0
	3-Axle Trucks		0	0	0	0	0	0	0	3	0	0	2	0
	4-Axle Trucks+		0	0	0	0	0	0	2	0	2	0	1	0
8:30	CARS		1	3	10	0	1	0	1	4	0	19	21	1
	2-Axle Trucks		0	0	0	0	0	0	0	0	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	2	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	2	0	0	0
8:45	CARS		1	4	17	1	1	0	0	8	0	32	18	2
	2-Axle Trucks		0	0	0	0	0	0	1	0	0	1	2	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	1	0	0	0

MOVEMENT TOTALS

CARS	7	12	169	1	2	2	11	53	0	210	175	12
2-Axle Trucks	0	0	3	0	0	0	1	5	0	2	9	0
3-Axle Trucks	0	0	1	1	0	0	0	16	0	1	9	2
4-Axle Trucks+	0	0	0	0	0	0	3	6	7	0	3	0
TOTALS	7	12	173	2	2	2	15	80	7	213	196	14
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 730 AM

PEAK VOLUMES =	4	4	106	1	0	1	10	52	3	112	118	8
PEAK HR. FACTOR:		0.838			0.250			0.893			0.850	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-006 Class

Location: Stewart Ave & Rivergrade Rd City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	1	1	0	0	1	0	1	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0	0	18	0	1	1	1	13	3	17	0	0
	2-Axle Trucks		0	0	0	0	0	0	0	1	1	0	3	0
	3-Axle Trucks		0	0	0	0	0	0	0	0	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	1	0	0
16:15	CARS		0	0	7	1	0	1	0	11	0	26	10	0
	2-Axle Trucks		0	0	0	0	0	0	0	1	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	0	0	0	2	0
	4-Axle Trucks+		0	0	0	0	0	1	1	1	0	0	1	0
16:30	CARS		0	0	15	2	6	12	0	17	3	18	8	1
	2-Axle Trucks		0	0	0	0	1	0	0	0	1	0	1	0
	3-Axle Trucks		0	0	0	1	0	0	0	1	0	0	0	0
	4-Axle Trucks+		0	0	1	0	0	0	0	0	0	0	0	0
16:45	CARS		1	0	12	0	2	0	0	8	1	21	1	0
	2-Axle Trucks		0	0	0	0	0	0	0	0	0	0	0	0
	3-Axle Trucks		0	0	0	0	0	0	0	2	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	1	0	0	0	0	1	0
17:00	CARS		2	0	26	2	0	0	0	29	8	19	7	0
	2-Axle Trucks		1	0	0	0	0	0	0	0	0	0	0	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	1	0	1	0	0	0	0
17:15	CARS		1	0	17	0	0	-1	0	14	2	20	8	1
	2-Axle Trucks		1	0	0	0	0	0	0	0	0	1	0	0
	3-Axle Trucks		0	0	0	0	0	0	0	0	0	1	1	0
	4-Axle Trucks+		0	0	0	0	0	1	0	1	0	1	0	0
17:30	CARS		0	0	22	0	8	3	0	15	0	15	0	1
	2-Axle Trucks		0	0	0	0	0	0	0	0	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	0	0
	4-Axle Trucks		0	0	0	0	0	0	0	0	0	0	0	0
17:45	CARS		0	0	13	0	0	0	0	13	1	16	2	0
	2-Axle Trucks		1	0	0	0	0	0	0	0	0	1	0	0
	3-Axle Trucks		0	0	0	0	0	0	0	0	0	0	0	0
	4-Axle Trucks		0	0	0	0	0	0	0	2	0	1	0	0

MOVEMENT TOTALS

CARS	4	0	130	5	17	16	1	120	18	152	36	3
2-Axle Trucks	3	0	0	0	1	0	0	2	2	2	6	0
3-Axle Trucks	0	0	0	1	0	0	0	5	0	1	5	0
4-Axle Trucks+	0	0	1	0	0	4	1	5	0	3	2	0
TOTALS	7	0	131	6	18	20	2	132	20	158	49	3
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1630 PM

PEAK VOLUMES =	6	0	71	5	9	14	0	74	15	81	28	2
PEAK HR. FACTOR:		0.664			0.318			0.571			0.841	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-007 Class

Location: I-605 SB On-Ramp & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: No Control

		LANES:	0	0	0	0	0	0	0	2	1	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		0	0	0	0	0	0	0	34	96	183	221	0
	2-Axle Trucks		0	0	0	0	0	0	0	0	7	7	5	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	7	12	17	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	7	3	3	0
7:15	CARS		0	0	0	0	0	0	0	40	125	167	274	0
	2-Axle Trucks		0	0	0	0	0	0	0	3	1	4	2	0
	3-Axle Trucks		0	0	0	0	0	0	0	3	10	9	18	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	5	3	3	0
7:30	CARS		0	0	0	0	0	0	0	49	102	144	277	0
	2-Axle Trucks		0	0	0	0	0	0	0	1	3	9	8	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	3	17	12	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	7	3	0	0
7:45	CARS		0	0	0	0	0	0	0	86	87	127	247	0
	2-Axle Trucks		0	0	0	0	0	0	0	0	7	2	3	0
	3-Axle Trucks		0	0	0	0	0	0	0	4	10	10	13	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	1	4	1	0
8:00	CARS		0	0	0	0	0	0	0	65	96	127	236	0
	2-Axle Trucks		0	0	0	0	0	0	0	3	3	4	7	0
	3-Axle Trucks		0	0	0	0	0	0	0	2	10	5	13	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	6	1	3	0
8:15	CARS		0	0	0	0	0	0	0	58	112	114	247	0
	2-Axle Trucks		0	0	0	0	0	0	0	3	3	12	4	0
	3-Axle Trucks		0	0	0	0	0	0	0	0	10	13	8	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	5	9	10	0
8:30	CARS		0	0	0	0	0	0	0	55	111	94	201	0
	2-Axle Trucks		0	0	0	0	0	0	0	0	5	13	6	0
	3-Axle Trucks		0	0	0	0	0	0	0	3	6	12	6	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	1	7	7	0
8:45	CARS		0	0	0	0	0	0	0	69	94	91	199	0
	2-Axle Trucks		0	0	0	0	0	0	0	3	7	12	5	0
	3-Axle Trucks		0	0	0	0	0	0	0	2	6	11	13	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	12	9	7	0

MOVEMENT TOTALS

CARS	0	0	0	0	0	0	0	456	823	1047	1902	0
2-Axle Trucks	0	0	0	0	0	0	0	13	36	63	40	0
3-Axle Trucks	0	0	0	0	0	0	0	16	62	89	100	0
4-Axle Trucks+	0	0	0	0	0	0	0	3	44	39	34	0
TOTALS	0	0	0	0	0	0	0	488	965	1238	2076	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	0	0	0	0	0	0	0	222	478	704	1104	0
PEAK HR. FACTOR:		0.000			0.000			0.897			0.942	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-007 Class

Location: I-605 SB On-Ramp & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: No Control

		LANES:	0	0	0	0	0	0	0	2	1	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0	0	0	0	0	0	0	138	146	120	140	0
	2-Axle Trucks		0	0	0	0	0	0	0	2	6	2	4	0
	3-Axle Trucks		0	0	0	0	0	0	0	4	4	5	15	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	5	4	0
16:15	CARS		0	0	0	0	0	0	0	173	142	96	142	0
	2-Axle Trucks		0	0	0	0	0	0	0	3	2	3	9	0
	3-Axle Trucks		0	0	0	0	0	0	0	7	6	1	9	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	2	4	6	0
16:30	CARS		0	0	0	0	0	0	0	172	182	138	162	0
	2-Axle Trucks		0	0	0	0	0	0	0	2	5	2	8	0
	3-Axle Trucks		0	0	0	0	0	0	0	2	5	6	10	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	4	4	0
16:45	CARS		0	0	0	0	0	0	0	155	188	107	157	0
	2-Axle Trucks		0	0	0	0	0	0	0	4	4	2	6	0
	3-Axle Trucks		0	0	0	0	0	0	0	6	8	2	4	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	3	2	4	0
17:00	CARS		0	0	0	0	0	0	0	237	196	149	168	0
	2-Axle Trucks		0	0	0	0	0	0	0	5	7	1	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	5	4	2	6	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	2	2	3	0
17:15	CARS		0	0	0	0	0	0	0	225	224	160	189	0
	2-Axle Trucks		0	0	0	0	0	0	0	4	4	4	2	0
	3-Axle Trucks		0	0	0	0	0	0	0	3	0	3	4	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	4	2	6	0
17:30	CARS		0	0	0	0	0	0	0	208	219	125	207	0
	2-Axle Trucks		0	0	0	0	0	0	0	4	8	1	4	0
	3-Axle Trucks		0	0	0	0	0	0	0	2	2	0	3	0
	4-Axle Trucks		0	0	0	0	0	0	0	1	4	2	4	0
17:45	CARS		0	0	0	0	0	0	0	186	215	122	201	0
	2-Axle Trucks		0	0	0	0	0	0	0	1	4	2	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	1	1	6	0
	4-Axle Trucks		0	0	0	0	0	0	0	2	2	3	7	0

MOVEMENT TOTALS

CARS	0	0	0	0	0	0	0	1494	1512	1017	1366	0
2-Axle Trucks	0	0	0	0	0	0	0	25	40	17	35	0
3-Axle Trucks	0	0	0	0	0	0	0	30	30	20	57	0
4-Axle Trucks+	0	0	0	0	0	0	0	6	17	24	38	0
TOTALS	0	0	0	0	0	0	0	1555	1599	1078	1496	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1700 PM

PEAK VOLUMES =	0	0	0	0	0	0	0	885	896	579	812	0
PEAK HR. FACTOR:		0.000			0.000			0.960			0.940	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-008 Class

Location: I-605 NB Off-Ramp & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: No Control

		LANES:	0	0	1	0	0	1	0	2	0	0	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		0	0	62	0	0	90	0	30	0	0	306	0
	2-Axle Trucks		0	0	3	0	0	4	0	1	0	0	16	0
	3-Axle Trucks		0	0	2	0	0	3	0	1	0	0	11	0
	4-Axle Trucks+		0	0	12	0	0	2	0	0	0	0	15	0
7:15	CARS		0	0	96	0	0	88	0	36	0	0	354	0
	2-Axle Trucks		0	0	7	0	0	2	0	3	0	0	13	0
	3-Axle Trucks		0	0	1	0	0	5	0	2	0	0	8	0
	4-Axle Trucks+		0	0	10	0	0	9	0	1	0	0	15	0
7:30	CARS		0	0	114	0	0	122	0	46	0	0	288	0
	2-Axle Trucks		0	0	5	0	0	4	0	1	0	0	10	0
	3-Axle Trucks		0	0	9	0	0	6	0	1	0	0	25	0
	4-Axle Trucks+		0	0	2	0	0	0	0	0	0	0	3	0
7:45	CARS		0	0	139	0	0	136	0	87	0	0	247	0
	2-Axle Trucks		0	0	1	0	0	4	0	2	0	0	4	0
	3-Axle Trucks		0	0	10	0	0	7	0	5	0	0	21	0
	4-Axle Trucks+		0	0	5	0	0	1	0	0	0	0	2	0
8:00	CARS		0	0	121	0	0	123	0	69	0	0	239	0
	2-Axle Trucks		0	0	2	0	0	8	0	2	0	0	4	0
	3-Axle Trucks		0	0	8	0	0	6	0	2	0	0	15	0
	4-Axle Trucks+		0	0	4	0	0	2	0	0	0	0	1	0
8:15	CARS		0	0	102	0	0	112	0	66	-1	0	246	0
	2-Axle Trucks		0	0	7	0	0	3	0	2	0	0	8	0
	3-Axle Trucks		0	0	8	0	0	5	0	0	0	0	25	0
	4-Axle Trucks+		0	0	4	0	0	3	0	0	1	0	8	0
8:30	CARS		0	0	86	0	0	104	0	53	0	0	208	0
	2-Axle Trucks		0	0	6	0	0	6	0	1	0	0	3	0
	3-Axle Trucks		0	0	11	0	0	8	0	4	0	0	13	0
	4-Axle Trucks+		0	0	4	0	0	4	0	1	0	0	2	0
8:45	CARS		0	0	105	0	0	103	0	69	0	0	199	0
	2-Axle Trucks		0	0	6	0	0	5	0	1	0	0	7	0
	3-Axle Trucks		0	0	4	0	0	13	0	1	0	0	18	0
	4-Axle Trucks+		0	0	5	0	0	1	0	0	0	0	5	0

MOVEMENT TOTALS

CARS	0	0	825	0	0	878	0	456	-1	0	2087	0
2-Axle Trucks	0	0	37	0	0	36	0	13	0	0	65	0
3-Axle Trucks	0	0	53	0	0	53	0	16	0	0	136	0
4-Axle Trucks+	0	0	46	0	0	22	0	2	1	0	51	0
TOTALS	0	0	961	0	0	989	0	487	0	0	2339	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	0	0	534	0	0	523	0	257	0	0	1249	0
PEAK HR. FACTOR:		0.861			0.883			0.684			0.801	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-008 Class

Location: I-605 NB Off-Ramp & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: No Control

		LANES:	0	0	1	0	0	1	0	2	0	0	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0	0	111	0	0	106	0	136	0	0	166	0
	2-Axle Trucks		0	0	10	0	0	5	0	3	0	0	3	0
	3-Axle Trucks		0	0	11	0	0	14	0	5	0	0	6	0
	4-Axle Trucks+		0	0	1	0	0	3	0	0	0	0	5	0
16:15	CARS		0	0	144	0	0	96	0	173	0	0	162	0
	2-Axle Trucks		0	0	8	0	0	10	0	4	0	0	5	0
	3-Axle Trucks		0	0	11	0	0	8	0	6	0	0	4	0
	4-Axle Trucks+		0	0	2	0	0	4	0	1	0	0	5	0
16:30	CARS		0	0	133	0	0	90	0	175	0	0	226	0
	2-Axle Trucks		0	0	4	0	0	1	0	1	0	0	8	0
	3-Axle Trucks		0	0	12	0	0	7	0	2	0	0	8	0
	4-Axle Trucks+		0	0	3	0	0	5	0	0	0	0	1	0
16:45	CARS		0	0	133	0	0	99	0	165	0	0	179	0
	2-Axle Trucks		0	0	7	0	0	5	0	4	0	0	2	0
	3-Axle Trucks		0	0	12	0	0	3	0	6	0	0	3	0
	4-Axle Trucks+		0	0	1	0	0	2	0	1	0	0	3	0
17:00	CARS		0	0	121	0	0	96	0	239	0	0	239	0
	2-Axle Trucks		0	0	6	0	0	1	0	4	0	0	1	0
	3-Axle Trucks		0	0	15	0	0	3	0	4	0	0	3	0
	4-Axle Trucks+		0	0	1	0	0	3	0	1	0	0	2	0
17:15	CARS		0	0	144	0	0	96	0	221	0	0	164	0
	2-Axle Trucks		0	0	5	0	0	1	0	4	0	0	4	0
	3-Axle Trucks		0	0	9	0	0	3	0	3	0	0	3	0
	4-Axle Trucks+		0	0	2	0	0	7	0	1	0	0	3	0
17:30	CARS		0	0	151	0	0	132	0	208	0	0	210	0
	2-Axle Trucks		0	0	3	0	0	2	0	3	0	0	3	0
	3-Axle Trucks		0	0	8	0	0	3	0	2	0	0	3	0
	4-Axle Trucks		0	0	1	0	0	4	0	1	0	0	4	0
17:45	CARS		0	0	144	0	0	142	0	183	0	0	190	0
	2-Axle Trucks		0	0	3	0	0	0	0	1	0	0	1	0
	3-Axle Trucks		0	0	5	0	0	4	0	1	0	0	2	0
	4-Axle Trucks		0	0	5	0	0	6	0	2	0	0	5	0

MOVEMENT TOTALS

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
CARS	0	0	1081	0	0	857	0	1500	0	0	1536	0
2-Axle Trucks	0	0	46	0	0	25	0	24	0	0	27	0
3-Axle Trucks	0	0	83	0	0	45	0	29	0	0	32	0
4-Axle Trucks+	0	0	16	0	0	34	0	7	0	0	28	0
TOTALS	0	0	1226	0	0	961	0	1560	0	0	1623	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1700 PM

PEAK VOLUMES =	0	0	623	0	0	503	0	878	0	0	837	0
PEAK HR. FACTOR:		0.956			0.827			0.885			0.854	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-009 Class

Location: Graham Access Rd & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	1	0	0	0	0	0	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		2	0	1	0	0	0	0	93	2	3	315	0
	2-Axle Trucks		2	0	0	0	0	0	0	1	1	0	8	0
	3-Axle Trucks		5	0	2	0	0	0	0	2	8	0	19	0
	4-Axle Trucks+		0	0	1	0	0	0	0	3	1	0	6	0
7:15	CARS		13	0	2	0	0	0	0	122	16	3	339	0
	2-Axle Trucks		3	0	2	0	0	0	0	8	0	0	6	0
	3-Axle Trucks		4	0	2	0	0	0	0	4	4	0	11	0
	4-Axle Trucks+		1	0	0	0	0	0	0	5	1	0	7	0
7:30	CARS		19	0	2	0	0	0	0	147	7	6	273	0
	2-Axle Trucks		5	0	0	0	0	0	0	8	1	2	10	0
	3-Axle Trucks		8	0	2	0	0	0	0	4	6	0	10	0
	4-Axle Trucks+		0	0	0	0	0	0	0	4	0	0	7	0
7:45	CARS		4	0	3	0	0	0	0	225	2	2	249	0
	2-Axle Trucks		1	0	2	0	0	0	0	2	0	1	3	0
	3-Axle Trucks		8	0	3	0	0	0	0	6	4	3	9	0
	4-Axle Trucks+		0	0	0	0	0	0	0	9	1	0	4	0
8:00	CARS		0	0	1	0	0	0	0	191	3	1	241	0
	2-Axle Trucks		0	0	0	0	0	0	0	4	1	0	7	0
	3-Axle Trucks		4	0	0	0	0	0	0	6	3	0	9	0
	4-Axle Trucks+		0	0	0	0	0	0	0	5	1	0	3	0
8:15	CARS		9	0	4	0	0	0	0	152	10	5	247	0
	2-Axle Trucks		1	0	0	0	0	0	0	9	0	0	8	0
	3-Axle Trucks		7	0	0	0	0	0	0	1	0	0	14	0
	4-Axle Trucks+		0	0	0	0	0	0	0	8	1	1	12	0
8:30	CARS		0	0	1	0	0	0	0	149	1	1	195	0
	2-Axle Trucks		0	0	0	0	0	0	0	6	0	1	5	0
	3-Axle Trucks		6	0	0	0	0	0	0	7	9	3	5	0
	4-Axle Trucks+		0	0	0	0	0	0	0	5	0	0	6	0
8:45	CARS		5	0	3	0	0	0	0	153	2	4	176	0
	2-Axle Trucks		0	0	0	0	0	0	0	8	0	0	6	0
	3-Axle Trucks		5	0	0	0	0	0	0	2	3	0	11	0
	4-Axle Trucks+		1	0	0	0	0	0	0	4	0	0	4	0

MOVEMENT TOTALS

CARS	52	0	17	0	0	0	0	1232	43	25	2035	0
2-Axle Trucks	12	0	4	0	0	0	0	46	3	4	53	0
3-Axle Trucks	47	0	9	0	0	0	0	32	37	6	88	0
4-Axle Trucks+	2	0	1	0	0	0	0	43	5	1	49	0
TOTALS	113	0	31	0	0	0	0	1353	88	36	2225	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	70	0	19	0	0	0	0	750	50	18	1188	0
PEAK HR. FACTOR:		0.618			0.000			0.803			0.824	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-009 Class

Location: Graham Access Rd & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	1	0	0	0	0	0	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		5	0	10	0	0	0	0	256	1	0	151	0
	2-Axle Trucks		0	0	0	0	0	0	0	13	0	0	3	0
	3-Axle Trucks		1	0	0	0	0	0	0	12	0	0	4	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	5	0
16:15	CARS		1	0	9	0	0	0	0	309	1	0	152	0
	2-Axle Trucks		3	0	0	0	0	0	0	12	0	0	3	0
	3-Axle Trucks		1	0	0	0	0	0	0	16	2	1	2	0
	4-Axle Trucks+		0	0	0	0	0	0	0	3	0	1	6	0
16:30	CARS		9	0	4	0	0	0	0	300	0	2	207	0
	2-Axle Trucks		0	0	0	0	0	0	0	7	0	0	7	0
	3-Axle Trucks		4	0	0	0	0	0	0	13	1	0	4	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	2	0
16:45	CARS		1	0	4	0	0	0	0	301	0	0	169	0
	2-Axle Trucks		0	0	0	0	0	0	0	10	1	0	2	0
	3-Axle Trucks		0	0	0	0	0	0	0	17	1	0	2	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	3	0
17:00	CARS		0	0	3	0	0	0	0	356	2	0	252	0
	2-Axle Trucks		0	0	0	0	0	0	0	8	0	0	0	0
	3-Axle Trucks		0	0	0	0	0	0	0	18	2	0	3	0
	4-Axle Trucks+		0	0	0	0	0	0	0	3	0	0	2	0
17:15	CARS		2	0	4	0	0	0	0	363	0	0	216	0
	2-Axle Trucks		0	0	0	0	0	0	0	5	3	0	4	0
	3-Axle Trucks		0	0	0	0	0	0	0	13	3	0	3	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	0	0	3	0
17:30	CARS		1	0	4	0	0	0	0	364	0	0	197	0
	2-Axle Trucks		0	0	0	0	0	0	0	8	0	0	5	0
	3-Axle Trucks		1	0	1	0	0	0	0	7	1	0	1	0
	4-Axle Trucks		0	0	0	0	0	0	0	4	0	0	3	0
17:45	CARS		0	0	2	0	0	0	0	330	0	0	183	0
	2-Axle Trucks		0	0	0	0	0	0	0	2	0	0	1	0
	3-Axle Trucks		1	0	0	0	0	0	0	5	0	0	1	0
	4-Axle Trucks		0	0	0	0	0	0	0	6	0	0	4	0

MOVEMENT TOTALS

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
CARS	19	0	40	0	0	0	0	2579	4	2	1527	0
2-Axle Trucks	3	0	0	0	0	0	0	65	4	0	25	0
3-Axle Trucks	8	0	1	0	0	0	0	101	10	1	20	0
4-Axle Trucks+	0	0	0	0	0	0	0	23	0	1	28	0
TOTALS	30	0	41	0	0	0	0	2768	18	4	1600	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1700 PM

PEAK VOLUMES =	5	0	14	0	0	0	0	1493	11	0	878	0
PEAK HR. FACTOR:		0.679			0.000			0.967			0.854	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-010 Class

Location: Live Oak LN & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	0	0	0	1	0	1	2	0	0	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		0	0	0	0	0	3	3	84	0	0	323	7
	2-Axle Trucks		0	0	0	0	0	0	1	0	0	0	6	0
	3-Axle Trucks		0	0	0	0	0	7	2	2	0	0	13	1
	4-Axle Trucks+		0	0	0	0	0	0	0	4	0	0	4	0
7:15	CARS		0	0	0	2	0	1	10	113	0	0	318	1
	2-Axle Trucks		0	0	0	0	0	0	0	8	0	0	6	0
	3-Axle Trucks		0	0	0	0	0	5	3	5	0	0	5	2
	4-Axle Trucks+		0	0	0	0	0	4	0	3	0	0	3	0
7:30	CARS		0	0	0	0	0	3	9	141	0	0	283	5
	2-Axle Trucks		0	0	0	0	0	2	0	8	0	0	11	0
	3-Axle Trucks		0	0	0	0	0	10	1	4	0	0	5	1
	4-Axle Trucks+		0	0	0	0	0	2	1	4	0	0	3	1
7:45	CARS		0	0	0	0	0	0	10	217	0	0	237	2
	2-Axle Trucks		0	0	0	0	0	0	0	4	0	0	3	0
	3-Axle Trucks		0	0	0	0	0	5	2	6	0	0	5	0
	4-Axle Trucks+		0	0	0	0	0	1	2	7	0	0	5	0
8:00	CARS		0	0	0	0	0	3	9	178	0	0	235	4
	2-Axle Trucks		0	0	0	0	0	1	1	3	0	0	6	0
	3-Axle Trucks		0	0	0	0	0	8	2	2	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	2	2	5	0	0	2	1
8:15	CARS		0	0	0	1	0	5	3	145	0	0	246	2
	2-Axle Trucks		0	0	0	0	0	0	0	11	0	0	9	0
	3-Axle Trucks		0	0	0	1	0	7	1	0	0	0	5	1
	4-Axle Trucks+		0	0	0	0	0	2	2	6	0	0	11	0
8:30	CARS		0	0	0	0	0	7	7	142	0	0	193	3
	2-Axle Trucks		0	0	0	0	0	0	0	6	0	0	4	0
	3-Axle Trucks		0	0	0	0	0	2	3	4	0	0	6	1
	4-Axle Trucks+		0	0	0	0	0	3	0	4	0	0	3	0
8:45	CARS		0	0	0	1	0	4	8	169	0	0	186	6
	2-Axle Trucks		0	0	0	0	0	0	0	7	0	0	10	2
	3-Axle Trucks		0	0	0	0	0	7	1	3	0	0	3	1
	4-Axle Trucks+		0	0	0	0	0	0	0	4	0	0	6	0

MOVEMENT TOTALS

CARS	0	0	0	4	0	26	59	1189	0	0	2021	30
2-Axle Trucks	0	0	0	0	0	3	2	47	0	0	55	2
3-Axle Trucks	0	0	0	1	0	51	15	26	0	0	43	7
4-Axle Trucks+	0	0	0	0	0	14	7	37	0	0	37	2
TOTALS	0	0	0	5	0	94	83	1299	0	0	2156	41
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	0	0	0	2	0	47	52	708	0	0	1128	17
PEAK HR. FACTOR:		0.000			0.721			0.766			0.854	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-010 Class

Location: Live Oak LN & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	0	0	0	1	0	1	2	0	0	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0	0	0	0	0	14	3	256	0	0	138	0
	2-Axle Trucks		0	0	0	0	0	0	0	22	0	0	5	1
	3-Axle Trucks		0	0	0	0	0	1	4	5	0	0	3	0
	4-Axle Trucks+		0	0	0	0	0	1	2	2	0	0	5	0
16:15	CARS		0	0	0	1	0	5	6	307	0	0	146	1
	2-Axle Trucks		0	0	0	1	0	1	0	17	0	0	5	0
	3-Axle Trucks		0	0	0	0	0	1	3	10	0	0	0	1
	4-Axle Trucks+		0	0	0	0	0	2	1	4	0	0	7	0
16:30	CARS		0	0	0	0	0	8	2	296	0	0	207	0
	2-Axle Trucks		0	0	0	0	0	0	2	3	0	0	4	0
	3-Axle Trucks		0	0	0	1	0	2	4	5	0	0	1	1
	4-Axle Trucks+		0	0	0	0	0	0	0	4	0	0	2	0
16:45	CARS		0	0	0	0	0	6	2	308	0	0	155	0
	2-Axle Trucks		0	0	0	0	0	0	0	6	0	0	2	0
	3-Axle Trucks		0	0	0	0	0	2	3	17	0	0	1	1
	4-Axle Trucks+		0	0	0	0	0	1	1	1	0	0	1	0
17:00	CARS		0	0	0	1	0	9	2	352	0	0	250	1
	2-Axle Trucks		0	0	0	0	0	0	0	3	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	2	2	21	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	0	0	2	0
17:15	CARS		0	0	0	0	0	16	0	367	0	0	194	0
	2-Axle Trucks		0	0	0	0	0	0	0	5	0	0	3	0
	3-Axle Trucks		0	0	0	0	0	2	3	11	0	0	2	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	0	0	2	0
17:30	CARS		0	0	0	1	0	10	0	369	0	0	195	0
	2-Axle Trucks		0	0	0	0	0	0	0	7	0	0	2	0
	3-Axle Trucks		0	0	0	0	0	1	3	6	0	0	1	0
	4-Axle Trucks		0	0	0	0	0	0	0	2	0	0	2	0
17:45	CARS		0	0	0	3	0	1	0	340	0	0	182	0
	2-Axle Trucks		0	0	0	0	0	0	0	1	0	0	1	1
	3-Axle Trucks		0	0	0	0	0	1	2	3	0	0	0	0
	4-Axle Trucks		0	0	0	0	0	1	0	4	0	0	3	0

MOVEMENT TOTALS

CARS	0	0	0	6	0	69	15	2595	0	0	1467	2
2-Axle Trucks	0	0	0	1	0	1	2	64	0	0	23	2
3-Axle Trucks	0	0	0	1	0	12	24	78	0	0	9	3
4-Axle Trucks+	0	0	0	0	0	5	4	19	0	0	24	0
TOTALS	0	0	0	8	0	87	45	2756	0	0	1523	7
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1700 PM

PEAK VOLUMES =	0	0	0	5	0	43	12	1493	0	0	841	2
PEAK HR. FACTOR:		0.000			0.667			0.972			0.826	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-011 Class

Location: Rivergrade Rd & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

	LANES:	1	2	0	1	2	1	1	2	0	1	2	0
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS	6	2	10	0	6	4	4	82	3	41	333	0
	2-Axle Trucks	0	1	0	0	0	0	0	2	0	0	6	0
	3-Axle Trucks	0	0	0	0	0	0	1	2	0	1	15	0
	4-Axle Trucks+	0	0	0	0	0	0	0	3	0	0	6	0
7:15	CARS	3	7	25	1	7	5	8	100	9	40	312	1
	2-Axle Trucks	1	1	1	0	1	0	1	2	0	0	5	0
	3-Axle Trucks	0	0	0	0	0	0	0	4	0	1	5	0
	4-Axle Trucks+	0	2	1	0	0	1	1	4	0	0	2	0
7:30	CARS	4	4	20	0	14	1	5	129	13	58	275	2
	2-Axle Trucks	0	1	0	0	1	1	2	4	0	1	11	0
	3-Axle Trucks	0	0	1	0	0	0	0	2	1	0	5	0
	4-Axle Trucks+	0	1	0	0	0	1	0	3	0	1	2	0
7:45	CARS	8	6	44	5	15	4	2	190	16	58	234	0
	2-Axle Trucks	0	0	4	0	0	0	0	6	0	1	2	0
	3-Axle Trucks	0	1	0	0	3	0	0	5	2	1	3	0
	4-Axle Trucks+	0	0	2	0	0	0	3	4	0	0	5	0
8:00	CARS	9	1	39	3	13	2	6	159	8	50	228	0
	2-Axle Trucks	0	1	2	0	0	0	0	4	0	0	5	0
	3-Axle Trucks	0	0	0	0	0	0	0	1	0	0	1	0
	4-Axle Trucks+	0	0	0	0	0	0	1	3	0	0	2	0
8:15	CARS	7	0	41	2	16	4	6	136	14	29	230	1
	2-Axle Trucks	0	0	2	1	0	0	0	8	0	0	10	0
	3-Axle Trucks	0	1	1	0	0	1	1	1	0	0	8	0
	4-Axle Trucks+	0	1	0	1	0	1	2	4	0	1	8	0
8:30	CARS	7	1	26	1	14	2	6	127	7	21	192	0
	2-Axle Trucks	1	0	1	1	0	0	0	6	0	1	2	0
	3-Axle Trucks	0	0	0	0	0	2	1	3	0	0	5	0
	4-Axle Trucks+	0	1	0	0	0	0	2	3	0	0	5	0
8:45	CARS	3	5	25	1	9	7	2	150	9	17	180	2
	2-Axle Trucks	0	0	0	0	0	2	1	11	0	1	11	0
	3-Axle Trucks	0	0	1	0	0	0	0	2	1	0	2	0
	4-Axle Trucks+	0	0	0	0	0	0	0	4	0	0	6	0

MOVEMENT TOTALS

CARS	47	26	230	13	94	29	39	1073	79	314	1984	6
2-Axle Trucks	2	4	10	2	2	3	4	43	0	4	52	0
3-Axle Trucks	0	2	3	0	3	3	3	20	4	3	44	0
4-Axle Trucks+	0	5	3	1	0	3	9	28	0	2	36	0
TOTALS	49	37	246	16	99	38	55	1164	83	323	2116	6
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	25	25	139	9	54	15	29	620	49	211	1097	3
PEAK HR. FACTOR:		0.727			0.722			0.765			0.895	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-011 Class

Location: Rivergrade Rd & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	1	2	0	1	2	1	1	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		7	7	83	0	2	2	2	268	0	10	136	2
	2-Axle Trucks		1	0	2	0	0	0	0	6	0	1	2	0
	3-Axle Trucks		1	1	3	0	0	0	0	8	0	0	0	0
	4-Axle Trucks+		0	1	1	0	0	3	0	1	0	0	2	1
16:15	CARS		12	7	66	2	6	6	3	306	4	17	134	2
	2-Axle Trucks		0	0	0	0	0	1	1	15	0	1	0	0
	3-Axle Trucks		0	0	1	0	0	2	0	9	0	1	1	0
	4-Axle Trucks+		0	1	1	0	0	2	0	2	0	0	4	0
16:30	CARS		16	15	83	0	3	17	3	282	3	20	176	2
	2-Axle Trucks		0	1	0	0	0	0	0	4	0	0	6	0
	3-Axle Trucks		0	0	3	0	0	0	1	9	0	0	2	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	0	0	1	0
16:45	CARS		10	5	76	0	1	5	2	304	5	18	137	4
	2-Axle Trucks		0	0	0	0	0	1	0	12	0	0	1	0
	3-Axle Trucks		0	0	1	0	0	0	0	15	1	0	1	0
	4-Axle Trucks+		1	0	1	0	0	0	0	2	0	0	2	0
17:00	CARS		28	22	106	0	4	11	2	337	2	25	214	5
	2-Axle Trucks		0	0	0	0	1	0	0	8	0	0	1	0
	3-Axle Trucks		0	1	5	0	0	0	0	15	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	0	0	1	0
17:15	CARS		15	13	85	0	2	8	0	372	7	14	173	2
	2-Axle Trucks		0	0	1	0	0	0	0	4	0	1	4	0
	3-Axle Trucks		0	0	1	0	0	0	0	11	0	0	2	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	1	0
17:30	CARS		31	9	75	0	2	2	1	362	5	19	162	2
	2-Axle Trucks		0	0	1	0	0	0	0	8	0	0	3	0
	3-Axle Trucks		0	0	2	0	0	0	1	5	0	0	2	0
	4-Axle Trucks		0	0	0	0	0	0	0	4	0	0	2	0
17:45	CARS		15	12	78	0	1	5	1	332	3	9	155	2
	2-Axle Trucks		0	0	0	0	0	1	1	2	0	0	2	0
	3-Axle Trucks		0	0	3	0	0	0	0	4	0	0	0	0
	4-Axle Trucks		0	0	1	0	0	0	1	5	0	0	5	0

MOVEMENT TOTALS

CARS	134	90	652	2	21	56	14	2563	29	132	1287	21
2-Axle Trucks	1	1	4	0	1	3	2	59	0	3	19	0
3-Axle Trucks	1	2	19	0	0	2	2	76	1	1	9	0
4-Axle Trucks+	1	2	4	0	0	5	1	18	0	0	18	1
TOTALS	137	95	679	2	22	66	19	2716	30	136	1333	22
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1700 PM

PEAK VOLUMES =	89	57	358	0	10	27	7	1472	17	68	728	11
PEAK HR. FACTOR:		0.778			0.578			0.944			0.817	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-012 Class

Location: Stewart Ave & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	1	0	1	1	1	1	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		46	17	1	6	9	23	0	76	10	5	322	2
	2-Axle Trucks		0	0	0	0	0	0	1	2	1	0	4	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	14	0
	4-Axle Trucks+		0	0	0	0	0	0	0	3	1	0	9	0
7:15	CARS		53	20	4	2	3	13	0	102	7	9	338	6
	2-Axle Trucks		1	0	0	0	0	0	0	5	0	0	6	0
	3-Axle Trucks		0	0	0	0	0	0	0	4	0	0	8	0
	4-Axle Trucks+		0	0	0	0	0	0	0	3	0	0	4	0
7:30	CARS		49	23	7	0	3	19	2	128	5	12	338	5
	2-Axle Trucks		1	0	0	0	0	0	0	6	2	0	7	0
	3-Axle Trucks		0	0	0	0	0	0	0	2	0	0	3	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	5	0
7:45	CARS		40	18	8	0	5	24	5	199	7	4	307	4
	2-Axle Trucks		0	0	1	0	0	0	0	4	0	0	5	0
	3-Axle Trucks		0	0	0	0	0	0	0	7	0	0	4	0
	4-Axle Trucks+		0	0	0	0	0	0	1	3	0	0	4	0
8:00	CARS		35	13	6	1	9	10	3	165	8	3	273	2
	2-Axle Trucks		1	1	0	0	0	0	0	6	0	0	7	0
	3-Axle Trucks		0	0	0	0	0	0	1	2	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	1	0	5	0	0	2	0
8:15	CARS		23	16	5	3	5	20	4	153	7	3	270	4
	2-Axle Trucks		0	0	0	0	0	0	0	7	0	0	7	0
	3-Axle Trucks		0	0	1	0	0	1	0	2	0	0	6	0
	4-Axle Trucks+		0	0	0	0	0	0	1	5	0	0	7	1
8:30	CARS		27	14	8	2	6	13	8	146	5	3	209	8
	2-Axle Trucks		0	0	0	0	0	1	2	6	0	0	8	0
	3-Axle Trucks		0	0	0	0	0	0	0	3	0	0	6	0
	4-Axle Trucks+		0	0	0	0	0	1	0	3	0	0	3	0
8:45	CARS		18	7	5	4	5	15	7	139	6	4	193	3
	2-Axle Trucks		2	1	0	0	0	0	1	7	0	0	9	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	5	0
	4-Axle Trucks+		0	0	0	0	0	1	0	3	0	0	4	0

MOVEMENT TOTALS

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
CARS	291	128	44	18	45	137	29	1108	55	43	2250	34
2-Axle Trucks	5	2	1	0	0	1	4	43	3	0	53	0
3-Axle Trucks	0	0	1	0	0	1	1	22	0	0	46	0
4-Axle Trucks+	0	0	0	0	0	3	2	27	1	0	38	1
TOTALS	296	130	46	18	45	142	36	1200	59	43	2387	35
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	180	75	26	3	20	67	12	643	29	28	1311	17
PEAK HR. FACTOR:		0.878			0.776			0.757			0.914	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-012 Class

Location: Stewart Ave & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	1	0	1	1	1	1	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		8	4	1	2	9	1	8	334	34	6	139	1
	2-Axle Trucks		1	0	0	1	0	0	0	14	0	0	3	0
	3-Axle Trucks		0	0	0	0	0	0	0	13	1	0	3	0
	4-Axle Trucks+		0	0	0	1	0	0	0	2	0	0	3	0
16:15	CARS		7	6	4	3	27	2	6	356	31	4	138	0
	2-Axle Trucks		1	0	0	1	0	0	0	11	2	1	5	1
	3-Axle Trucks		0	0	0	0	0	0	0	10	0	3	1	0
	4-Axle Trucks+		0	0	0	0	0	1	0	4	0	0	4	1
16:30	CARS		13	4	7	8	16	2	9	400	27	7	182	2
	2-Axle Trucks		0	0	0	1	0	0	1	3	0	0	7	0
	3-Axle Trucks		0	0	0	0	0	0	0	9	4	1	2	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	0	0
16:45	CARS		6	7	6	6	19	3	4	384	36	8	156	1
	2-Axle Trucks		2	0	0	0	0	0	0	9	1	2	2	0
	3-Axle Trucks		1	0	0	0	0	0	0	9	4	2	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	0	0	1	0
17:00	CARS		15	10	2	13	19	10	10	456	40	7	190	2
	2-Axle Trucks		0	0	0	1	0	0	0	7	0	1	0	0
	3-Axle Trucks		0	0	0	0	0	0	0	18	4	1	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	0	1
17:15	CARS		8	6	7	10	16	4	12	456	48	7	170	2
	2-Axle Trucks		1	0	0	0	0	0	0	5	0	0	5	1
	3-Axle Trucks		0	0	0	0	1	0	0	8	4	1	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	3	0
17:30	CARS		10	7	5	8	19	3	16	467	37	8	153	1
	2-Axle Trucks		0	0	0	0	0	0	1	5	4	0	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	5	2	2	2	0
	4-Axle Trucks		0	0	0	0	0	0	0	2	0	0	2	0
17:45	CARS		15	5	5	3	13	0	5	419	27	9	151	1
	2-Axle Trucks		0	0	0	0	1	0	1	4	0	0	1	0
	3-Axle Trucks		0	0	0	0	0	0	0	3	4	0	0	0
	4-Axle Trucks		0	0	0	0	0	0	0	6	0	0	4	0

MOVEMENT TOTALS

CARS	82	49	37	53	138	25	70	3272	280	56	1279	10
2-Axle Trucks	5	0	0	4	1	0	3	58	7	4	24	2
3-Axle Trucks	1	0	0	0	1	0	0	75	23	10	9	0
4-Axle Trucks+	0	0	0	1	0	1	0	21	0	0	17	2
TOTALS	88	49	37	58	140	26	73	3426	310	70	1329	14
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1700 PM

PEAK VOLUMES =	49	28	19	35	69	17	45	1865	170	36	683	8
PEAK HR. FACTOR:		0.889			0.703			0.965			0.895	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-013 Class

Location: Baldwin Park Ave & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
LANES:		2	0	1	0	0	0	0	2	0	1	2	0
7:00	CARS	37	0	34	0	0	0	0	77	8	16	325	0
	2-Axle Trucks	1	0	1	0	0	0	0	3	0	4	6	0
	3-Axle Trucks	1	0	0	0	0	0	0	1	1	1	14	0
	4-Axle Trucks+	0	0	0	0	0	0	0	3	0	0	9	0
7:15	CARS	55	0	27	0	0	0	0	99	10	13	307	0
	2-Axle Trucks	0	0	0	0	0	0	0	6	0	2	7	0
	3-Axle Trucks	1	0	0	0	0	0	0	4	0	2	4	0
	4-Axle Trucks+	0	0	1	0	0	0	0	3	0	0	3	0
7:30	CARS	58	0	47	0	0	0	0	129	10	43	309	0
	2-Axle Trucks	0	0	1	0	0	0	0	3	0	1	7	0
	3-Axle Trucks	0	0	0	0	0	0	0	1	0	1	7	0
	4-Axle Trucks+	0	0	0	0	0	0	0	1	1	0	2	0
7:45	CARS	46	0	46	0	0	0	0	193	22	22	270	0
	2-Axle Trucks	0	0	2	0	0	0	0	7	0	2	5	0
	3-Axle Trucks	0	0	0	0	0	0	0	7	0	2	3	0
	4-Axle Trucks+	0	0	0	0	0	0	0	3	0	0	6	0
8:00	CARS	39	0	32	0	0	0	0	155	9	21	221	0
	2-Axle Trucks	0	0	1	0	0	0	0	6	1	0	8	0
	3-Axle Trucks	0	0	0	0	0	0	0	2	0	1	3	0
	4-Axle Trucks+	0	0	0	0	0	0	0	4	2	0	0	0
8:15	CARS	45	0	37	0	0	0	0	143	8	16	235	0
	2-Axle Trucks	0	0	1	0	0	0	0	8	0	0	7	0
	3-Axle Trucks	0	0	0	0	0	0	0	2	0	6	3	0
	4-Axle Trucks+	0	0	0	0	0	0	0	4	0	0	9	0
8:30	CARS	26	0	46	0	0	0	0	135	11	24	182	0
	2-Axle Trucks	0	0	2	0	0	0	0	8	0	0	6	0
	3-Axle Trucks	0	0	1	0	0	0	0	3	0	1	7	0
	4-Axle Trucks+	0	0	0	0	0	0	0	2	0	1	4	0
8:45	CARS	30	0	26	0	0	0	0	142	16	27	174	0
	2-Axle Trucks	0	0	2	0	0	0	0	9	0	2	8	0
	3-Axle Trucks	0	0	1	0	0	0	0	2	0	1	3	0
	4-Axle Trucks+	0	0	0	0	0	0	0	4	0	0	6	0

MOVEMENT TOTALS

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
CARS	336	0	295	0	0	0	0	1073	94	182	2023	0
2-Axle Trucks	1	0	10	0	0	0	0	50	1	11	54	0
3-Axle Trucks	2	0	2	0	0	0	0	22	1	15	44	0
4-Axle Trucks+	0	0	1	0	0	0	0	24	3	1	39	0
TOTALS	339	0	308	0	0	0	0	1169	99	209	2160	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	199	0	159	0	0	0	0	540	52	109	1284	0
PEAK HR. FACTOR:		0.844			0.000			0.638			0.929	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-013 Class

Location: Baldwin Park Ave & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	2	0	1	0	0	0	0	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		13	0	33	0	0	0	0	297	47	54	127	0
	2-Axle Trucks		1	0	1	0	0	0	0	10	0	2	2	0
	3-Axle Trucks		0	0	0	0	0	0	0	9	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	4	0	0	7	0
16:15	CARS		17	0	25	0	0	0	0	301	56	60	139	0
	2-Axle Trucks		2	0	1	0	0	0	0	10	0	0	4	0
	3-Axle Trucks		0	0	0	0	0	0	0	11	0	0	2	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	1	1	3	0
16:30	CARS		21	0	25	0	0	0	0	346	53	52	176	0
	2-Axle Trucks		0	0	0	0	0	0	0	3	0	1	4	0
	3-Axle Trucks		0	0	0	0	0	0	0	9	0	1	4	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	1	1	0
16:45	CARS		15	0	30	0	0	0	0	348	60	51	136	0
	2-Axle Trucks		0	0	0	0	0	0	0	8	0	1	5	0
	3-Axle Trucks		0	0	1	0	0	0	0	10	0	0	3	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	1	0	0	0
17:00	CARS		18	0	31	0	0	0	0	369	99	59	197	0
	2-Axle Trucks		0	0	0	0	0	0	0	7	3	0	1	0
	3-Axle Trucks		1	0	1	0	0	0	0	19	0	1	3	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	0	0	1	0
17:15	CARS		17	0	31	0	0	0	0	406	81	42	137	0
	2-Axle Trucks		0	0	0	0	0	0	0	8	2	2	7	0
	3-Axle Trucks		0	0	0	0	0	0	0	7	1	0	3	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	1	1	2	0
17:30	CARS		23	0	24	0	0	0	0	383	87	61	147	0
	2-Axle Trucks		0	0	1	0	0	0	0	4	0	1	2	0
	3-Axle Trucks		0	0	0	0	0	0	0	5	0	0	2	0
	4-Axle Trucks		0	0	0	0	0	0	0	2	1	1	2	0
17:45	CARS		17	0	25	0	0	0	0	356	75	48	132	0
	2-Axle Trucks		0	0	1	0	0	0	0	3	1	0	3	0
	3-Axle Trucks		0	0	0	0	0	0	0	3	1	0	1	0
	4-Axle Trucks		0	0	0	0	0	0	0	6	0	0	4	0

MOVEMENT TOTALS

CARS	141	0	224	0	0	0	0	2806	558	427	1191	0
2-Axle Trucks	3	0	4	0	0	0	0	53	6	7	28	0
3-Axle Trucks	1	0	2	0	0	0	0	73	2	2	19	0
4-Axle Trucks+	0	0	0	0	0	0	0	18	4	4	20	0
TOTALS	145	0	230	0	0	0	0	2950	570	440	1258	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1700 PM

PEAK VOLUMES =	76	0	114	0	0	0	0	1579	352	216	644	0
PEAK HR. FACTOR:		0.931			0.000			0.952			0.821	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-014 Class

Location: Arrow Hwy & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	0	0	2	0	1	1	2	0	0	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		0	0	0	58	0	9	13	99	0	0	363	303
	2-Axle Trucks		0	0	0	2	0	0	0	10	0	0	8	8
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	13	0
	4-Axle Trucks+		0	0	0	0	0	0	0	4	0	0	5	0
7:15	CARS		0	0	0	53	0	8	13	123	0	0	321	336
	2-Axle Trucks		0	0	0	3	0	1	0	9	0	0	7	4
	3-Axle Trucks		0	0	0	1	0	0	0	3	0	0	6	0
	4-Axle Trucks+		0	0	0	1	0	0	0	2	0	0	9	0
7:30	CARS		0	0	0	41	0	12	24	126	0	0	300	335
	2-Axle Trucks		0	0	0	1	0	1	0	8	0	0	8	2
	3-Axle Trucks		0	0	0	0	0	1	0	1	0	0	8	0
	4-Axle Trucks+		0	0	0	0	0	0	1	1	0	0	2	0
7:45	CARS		0	0	0	71	0	9	16	191	0	0	245	294
	2-Axle Trucks		0	0	0	2	0	2	0	5	0	0	6	4
	3-Axle Trucks		0	0	0	0	0	0	0	5	0	0	7	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	2	0
8:00	CARS		0	0	0	72	0	12	14	187	0	0	271	293
	2-Axle Trucks		0	0	0	1	0	0	0	8	0	0	7	0
	3-Axle Trucks		0	0	0	1	0	1	0	3	0	0	2	0
	4-Axle Trucks+		0	0	0	1	0	0	1	2	0	0	6	0
8:15	CARS		0	0	0	51	0	5	25	185	0	0	220	289
	2-Axle Trucks		0	0	0	2	0	0	0	6	0	0	8	5
	3-Axle Trucks		0	0	0	0	0	2	0	3	0	0	8	0
	4-Axle Trucks+		0	0	0	1	0	0	0	3	0	0	5	0
8:30	CARS		0	0	0	57	0	13	6	170	0	0	204	285
	2-Axle Trucks		0	0	0	3	0	0	0	7	0	0	5	5
	3-Axle Trucks		0	0	0	4	0	2	0	5	0	0	6	0
	4-Axle Trucks+		0	0	0	0	0	0	0	3	0	0	3	0
8:45	CARS		0	0	0	62	0	13	6	169	0	0	195	140
	2-Axle Trucks		0	0	0	4	0	3	0	7	0	0	12	4
	3-Axle Trucks		0	0	0	1	0	0	0	2	0	0	4	0
	4-Axle Trucks+		0	0	0	0	0	0	0	6	0	0	8	0

MOVEMENT TOTALS

CARS	0	0	0	465	0	81	117	1250	0	0	2119	2275
2-Axle Trucks	0	0	0	18	0	7	0	60	0	0	61	32
3-Axle Trucks	0	0	0	7	0	6	0	23	0	0	54	0
4-Axle Trucks+	0	0	0	3	0	0	2	23	0	0	40	0
TOTALS	0	0	0	493	0	94	119	1356	0	0	2274	2307
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	0	0	0	233	0	43	67	590	0	0	1310	1286
PEAK HR. FACTOR:		0.000			0.821			0.750			0.927	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-014 Class

Location: Arrow Hwy & Live Oak Ave City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	0	0	0	2	0	1	1	2	0	0	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		0	0	0	132	0	26	14	301	0	0	158	108
	2-Axle Trucks		0	0	0	3	0	0	0	14	0	0	6	0
	3-Axle Trucks		0	0	0	2	0	0	0	12	0	0	6	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	3	0
16:15	CARS		0	0	0	153	0	25	6	334	0	0	170	89
	2-Axle Trucks		0	0	0	2	0	2	1	8	0	0	5	1
	3-Axle Trucks		0	0	0	1	0	1	0	11	0	0	3	1
	4-Axle Trucks+		0	0	0	3	0	0	0	2	0	0	3	0
16:30	CARS		0	0	0	149	0	19	9	345	0	0	192	106
	2-Axle Trucks		0	0	0	2	0	2	0	9	0	0	2	4
	3-Axle Trucks		0	0	0	2	0	0	0	9	0	0	3	1
	4-Axle Trucks+		0	0	0	1	0	1	0	2	0	0	2	0
16:45	CARS		0	0	0	132	0	24	6	371	0	0	165	110
	2-Axle Trucks		0	0	0	1	0	1	0	7	0	0	5	4
	3-Axle Trucks		0	0	0	2	0	1	0	10	0	0	1	0
	4-Axle Trucks+		0	0	0	2	0	0	0	2	0	0	3	1
17:00	CARS		0	0	0	192	0	27	10	393	0	0	231	95
	2-Axle Trucks		0	0	0	3	0	1	1	4	0	0	3	1
	3-Axle Trucks		0	0	0	2	0	0	0	16	0	0	2	2
	4-Axle Trucks+		0	0	0	1	0	0	0	1	0	0	2	1
17:15	CARS		0	0	0	179	0	24	12	416	0	0	154	78
	2-Axle Trucks		0	0	0	1	0	1	0	8	0	0	3	1
	3-Axle Trucks		0	0	0	1	0	1	0	8	0	0	1	0
	4-Axle Trucks+		0	0	0	1	0	0	0	2	0	0	2	0
17:30	CARS		0	0	0	182	0	24	11	421	0	0	189	73
	2-Axle Trucks		0	0	0	1	0	0	0	3	0	0	1	1
	3-Axle Trucks		0	0	0	1	0	0	0	6	0	0	2	1
	4-Axle Trucks		0	0	0	0	0	0	0	3	0	0	2	0
17:45	CARS		0	0	0	151	0	20	8	369	0	0	165	59
	2-Axle Trucks		0	0	0	2	0	0	0	2	0	0	1	2
	3-Axle Trucks		0	0	0	0	0	0	0	3	0	0	1	1
	4-Axle Trucks		0	0	0	0	0	0	0	4	0	0	6	0

MOVEMENT TOTALS

CARS	0	0	0	1270	0	189	76	2950	0	0	1424	718
2-Axle Trucks	0	0	0	15	0	7	2	55	0	0	26	14
3-Axle Trucks	0	0	0	11	0	3	0	75	0	0	19	6
4-Axle Trucks+	0	0	0	8	0	1	0	18	0	0	23	2
TOTALS	0	0	0	1304	0	200	78	3098	0	0	1492	740
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1645 PM

PEAK VOLUMES =	0	0	0	701	0	104	40	1671	0	0	766	368
PEAK HR. FACTOR:		0.000			0.890			0.959			0.841	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-015 Class

Location: Maine Ave & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	2	0	1	0	0	0	0	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00	CARS		140	0	11	0	0	0	0	136	18	17	549	0
	2-Axle Trucks		2	0	0	0	0	0	0	5	1	0	13	0
	3-Axle Trucks		3	0	1	0	0	0	0	0	1	0	13	0
	4-Axle Trucks+		0	0	0	0	0	0	0	1	1	0	6	0
7:15	CARS		120	0	19	0	0	0	0	125	27	16	563	0
	2-Axle Trucks		3	0	0	0	0	0	0	6	0	0	10	0
	3-Axle Trucks		0	0	1	0	0	0	0	2	3	0	5	0
	4-Axle Trucks+		0	0	0	0	0	0	0	5	0	0	3	0
7:30	CARS		163	0	19	0	0	0	0	150	27	23	548	0
	2-Axle Trucks		3	0	1	0	0	0	0	10	1	0	9	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	9	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	0	2	0
7:45	CARS		111	0	17	0	0	0	0	291	35	20	515	0
	2-Axle Trucks		2	0	1	0	0	0	0	10	3	0	4	0
	3-Axle Trucks		0	0	0	0	0	0	0	7	0	0	6	0
	4-Axle Trucks+		0	0	0	0	0	0	0	3	0	0	6	0
8:00	CARS		114	0	23	0	0	0	0	208	36	10	342	0
	2-Axle Trucks		3	0	0	0	0	0	0	7	0	0	10	0
	3-Axle Trucks		0	0	0	0	0	0	0	1	0	0	2	0
	4-Axle Trucks+		0	0	2	0	0	0	0	4	0	0	3	0
8:15	CARS		79	0	21	0	0	0	0	210	31	14	386	0
	2-Axle Trucks		5	0	0	0	0	0	0	9	0	0	7	0
	3-Axle Trucks		2	0	1	0	0	0	0	2	0	0	5	0
	4-Axle Trucks+		1	0	0	0	0	0	0	5	0	0	7	0
8:30	CARS		89	0	16	0	0	0	0	189	18	14	311	0
	2-Axle Trucks		3	0	0	0	0	0	0	6	1	0	6	0
	3-Axle Trucks		0	0	0	0	0	0	0	6	2	0	5	0
	4-Axle Trucks+		0	0	0	0	0	0	0	2	0	1	5	0
8:45	CARS		78	0	19	0	0	0	0	181	28	15	279	0
	2-Axle Trucks		2	0	0	0	0	0	0	16	2	2	10	0
	3-Axle Trucks		1	0	0	0	0	0	0	3	0	1	5	0
	4-Axle Trucks+		2	0	0	0	0	0	0	3	0	1	5	0

MOVEMENT TOTALS

CARS	894	0	145	0	0	0	0	1490	220	129	3493	0
2-Axle Trucks	23	0	2	0	0	0	0	69	8	2	69	0
3-Axle Trucks	6	0	3	0	0	0	0	22	6	1	50	0
4-Axle Trucks+	3	0	2	0	0	0	0	25	1	2	37	0
TOTALS	926	0	152	0	0	0	0	1606	235	134	3649	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	547	0	70	0	0	0	0	754	117	76	2261	0
PEAK HR. FACTOR:		0.829			0.000			0.624			0.977	

NATIONAL DATA AND SURVEYING SERVICES

Axle Count

Project # 11-5229-015 Class

Location: Maine Ave & Arrow Hwy City: Irwindale Date: 06/15/2011 Day: Wednesday

CONTROL: Signalized

		LANES:	2	0	1	0	0	0	0	2	0	1	2	0
			NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
16:00	CARS		66	0	37	0	0	0	0	394	50	17	191	0
	2-Axle Trucks		0	0	0	0	0	0	0	14	2	1	6	0
	3-Axle Trucks		3	0	0	0	0	0	0	15	1	0	3	0
	4-Axle Trucks+		0	0	0	0	0	0	0	4	0	0	4	0
16:15	CARS		56	0	30	0	0	0	0	416	68	19	202	0
	2-Axle Trucks		1	0	0	0	0	0	0	10	1	0	3	0
	3-Axle Trucks		1	0	0	0	0	0	0	10	1	0	0	0
	4-Axle Trucks+		1	0	0	0	0	0	0	6	0	0	4	0
16:30	CARS		65	0	27	0	0	0	0	450	75	18	249	0
	2-Axle Trucks		1	0	1	0	0	0	0	6	0	0	7	0
	3-Axle Trucks		2	0	0	0	0	0	0	10	0	0	1	0
	4-Axle Trucks+		0	0	0	0	0	0	0	3	0	0	2	0
16:45	CARS		50	0	15	0	0	0	0	426	82	14	203	0
	2-Axle Trucks		1	0	2	0	0	0	0	8	3	0	4	0
	3-Axle Trucks		0	0	1	0	0	0	0	12	1	0	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	3	0	0	3	0
17:00	CARS		54	0	20	0	0	0	0	481	84	17	277	0
	2-Axle Trucks		1	0	1	0	0	0	0	6	2	0	3	0
	3-Axle Trucks		1	0	1	0	0	0	0	24	0	0	0	0
	4-Axle Trucks+		0	0	0	0	0	0	0	0	1	0	1	0
17:15	CARS		44	0	20	0	0	0	0	507	70	21	198	0
	2-Axle Trucks		1	0	0	0	0	0	0	10	0	0	4	0
	3-Axle Trucks		2	0	0	0	0	0	0	9	0	0	1	0
	4-Axle Trucks+		1	0	1	0	0	0	0	1	0	0	2	0
17:30	CARS		51	0	25	0	0	0	0	517	92	16	205	0
	2-Axle Trucks		1	0	0	0	0	0	0	3	1	0	5	0
	3-Axle Trucks		1	0	0	0	0	0	0	1	0	0	6	0
	4-Axle Trucks		0	0	0	0	0	0	0	4	1	0	1	0
17:45	CARS		51	0	17	0	0	0	0	438	75	19	182	0
	2-Axle Trucks		0	0	0	0	0	0	0	5	1	0	2	0
	3-Axle Trucks		1	0	0	0	0	0	0	2	0	0	3	0
	4-Axle Trucks		1	0	0	0	0	0	0	3	0	0	5	0

MOVEMENT TOTALS

CARS	437	0	191	0	0	0	0	3629	596	141	1707	0
2-Axle Trucks	6	0	4	0	0	0	0	62	10	1	34	0
3-Axle Trucks	11	0	2	0	0	0	0	83	3	0	14	0
4-Axle Trucks+	3	0	1	0	0	0	0	24	2	0	22	0
TOTALS	457	0	198	0	0	0	0	3798	611	142	1777	0
	NL	*NT*	*NR*	*SL*	*ST*	*SR*	*EL*	*ET*	*ER*	*WL*	*WT*	*WR*

PM Peak Hr Begins at: 1645 PM

PEAK VOLUMES =	208	0	86	0	0	0	0	2012	337	68	913	0
PEAK HR. FACTOR:		0.942			0.000			0.949			0.823	

APPENDIX D

Freeway Traffic Volume Data

Peak Hour Volume Source:
Caltrans Performance Measurement System (PeMS) website

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I-605 Northbound, South of Live Oak Avenue

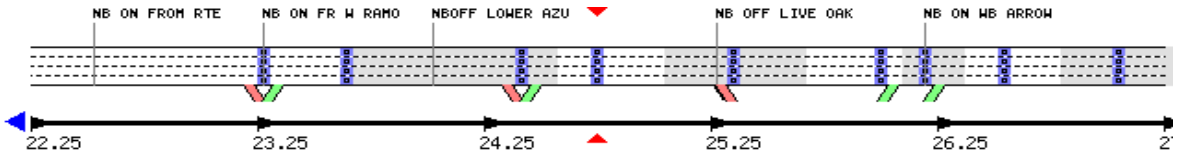
(Post Mile: Between 24.25 & 25.25)

DAILY				Data Quality	
Time	5/14/2013	5/15/2013	5/16/2013	# Lane Points	% Observed
Total	80,755	94,308	96,521	3,456	83.3

Daily Peak	96,521	5/16/2013

PEAK HOUR				Data Quality	
Time	Minimum	Mean	Maximum	# Lane Points	% Observed
7:00	4522	5578.67	6132	144	83.0
8:00	4605	5425.67	6125	144	83.0
9:00	4154	5020.33	5474	144	83.0
16:00	4793	5395.67	5742	144	83.0
17:00	4847	5572.33	6002	144	83.0
18:00	4236	4689.33	4962	144	83.0

AM Peak	6,132	7:00
PM Peak	6,002	17:00



I-605 Southbound, North of Arrow Highway

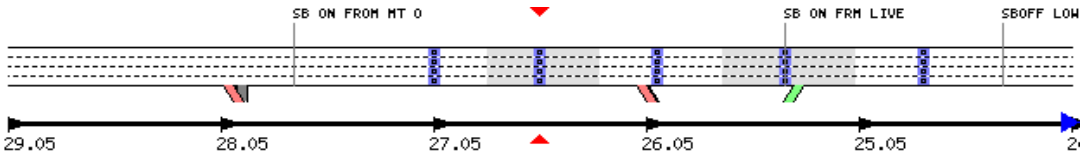
(Post Mile: Between 27.05 & 26.05)

DAILY				Data Quality	
Time	5/14/2013	5/15/2013	5/16/2013	# Lane Points	% Observed
Total	71,000	72,698	73,753	3,456	100.0

Daily Peak	73,753	5/16/2013

PEAK HOUR				Data Quality	
Time	Minimum	Mean	Maximum	# Lane Points	% Observed
7:00	4354	4399.67	4471	144	100.0
8:00	3916	3997.33	4153	144	100.0
9:00	3613	3688	3801	144	100.0
16:00	4441	4447	4454	144	100.0
17:00	4510	4596	4667	144	100.0
18:00	4214	4340.67	4472	144	100.0

AM Peak	4,471	7:00
PM Peak	4,667	17:00



I-210 Westbound, East of Irwindale Off-Ramp

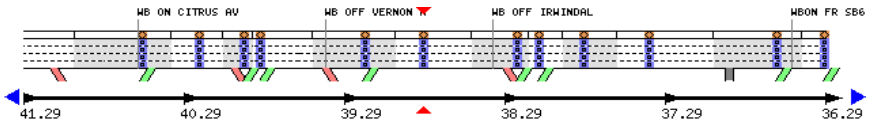
(Post Mile: 38.5)

DAILY					
DAILY				Data Quality	
Time	5/14/2013	5/15/2013	5/16/2013	# Lane Points	% Observed
Total	112,403	114,582	117,697	3,456	100.0

Daily Peak	117,697	5/16/2013

PEAK HOUR					
PEAK HOUR				Data Quality	
Time	Minimum	Mean	Maximum	# Lane Points	% Observed
7:00	4485	5893.67	6788	144	100.0
8:00	6436	6734	6961	144	100.0
9:00	6608	6719.33	6828	144	100.0
16:00	6621	6670.67	6762	144	100.0
17:00	6733	6877.33	7043	144	100.0
18:00	5713	5808.33	5857	144	100.0

AM Peak	6,961	8:00	5/16/2013
PM Peak	7,043	17:00	5/16/2013



I-210 Eastbound, East of Irwindale On-Ramp

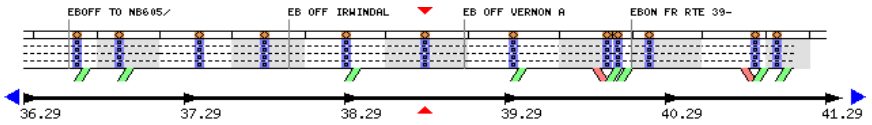
(Post Mile: 38.5)

DAILY					
DAILY				Data Quality	
Time	5/14/2013	5/15/2013	5/16/2013	# Lane Points	% Observed
7:00	6379	6399	6209	144	100.0
8:00	6284	6446	6241	144	100.0
9:00	5473	5355	5623	144	100.0
16:00	6677	6782	6511	144	100.0
17:00	6814	6837	6554	144	100.0
18:00	7046	6825	7235	144	100.0
Total	**110,925**	**111,522**	**114,599**	**3,456**	**100.0**

Daily Peak	**114,599**	**5/16/2013**

PEAK HOUR					
PEAK HOUR				Data Quality	
Time	Minimum	Mean	Maximum	# Lane Points	% Observed
7:00	6209	6329	6399	144	100.0
8:00	6241	6323.67	6446	144	100.0
9:00	5355	5483.67	5623	144	100.0
16:00	6511	6656.67	6782	144	100.0
17:00	6554	6735	6837	144	100.0
18:00	6825	7035.33	7235	144	100.0

AM Peak	**6,446**	**8:00**	**5/15/2013**
PM Peak	**7,235**	**18:00**	**5/16/2013**



Flow: I-210 EB (between ramps)

AM Peak	**6,429**	**8:00**	**5/15/2013**
PM Peak	**6,930**	**18:00**	**5/16/2013**

Flow: I-210 EB (w off ramp)

AM Peak	**4,420**	**8:00**	**5/15/2013**
PM Peak	**6,321**	**18:00**	**5/16/2013**

Truck Percentage Source:
Caltrans 2011 Annual Average Daily Truck Traffic on the California State Highway System

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2011

Annual Average Daily Truck Traffic on the California State Highway System

Compiled by
Traffic and Vehicle Data Systems

State of California
Business, Transportation and Housing Agency
Department of Transportation

Prepared in cooperation with the
U.S. Department of Transportation
Federal Highway Administration

RTE	DIST	CNTY	POST MILE	L E G	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT TOTAL By Axle 2	3	4	5+	% TRUCK AADT By Axle 2	3	4	5+	EAL 2-WAY (1000)	YEAR VER/ EST
605	07	LA	R17.407	B	INDUSTRY, JCT. RTE. 60, POMONA FREEWAY INTERCHANGE	249000	26070	10.47	9972	2471	1251	12375	38.25	9.48	4.8	47.47	5030	11E
605	07	LA	R17.407	A	INDUSTRY, JCT. RTE. 60, POMONA FREEWAY INTERCHANGE	220000	20900	9.5	8548	2215	1005	9131	40.9	10.6	4.81	43.69	3801	11E
605	07	LA	R20.189	B	BALDWIN PARK, JCT. RTE. 10, SAN BERNARDINO FREEWAY INTERCHANGE	217000	20615	9.5	8432	2185	992	9007	40.9	10.6	4.81	43.69	3749	11E
605	07	LA	20.189	A	BALDWIN PARK, JCT. RTE. 10, SAN BERNARDINO FREEWAY INTERCHANGE	182000	12358	6.79	5239	1757	716	4647	42.39	14.22	5.79	37.6	2053	11E
605	07	LA	22.681	O	SAN GABRIEL RIVER BRIDGE	157000	10660	6.79	4519	1516	617	4008	42.39	14.22	5.79	37.6	1771	11E
605	07	LA	25.76	B	IRWINDALE, JCT. RTE. 210, FOOTHILL FREEWAY INTERCHANGE	148000	10049	6.79	4260	1429	582	3778	42.39	14.22	5.79	37.6	1670	11E

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT TOTAL By Axle 2	3	4	5+	% TRUCK AADT By Axle 2	3	4	5+	EAL 2-WAY (1000)	YEAR VER/ EST
210	07	LA	R24.962	B	PASADENA, JCT. RTES. 134/710, VENTURA/LONG BEACH FREEWAYS INTERCHANGE	136000	9860	7.25	2908	410	204	6338	29.49	4.16	2.07	64.28	2356	11E
210	07	LA	R24.962	A	PASADENA, JCT. RTES. 134/710, VENTURA/LONG BEACH FREEWAYS INTERCHANGE	297000	13335	4.49	4086	1436	637	7176	30.64	10.77	4.78	53.81	2844	11E
210	07	LA	R26.326	A	PASADENA, LAKE AVENUE INTERCHANGE	297000	13335	4.49	4086	1436	637	7176	30.64	10.77	4.78	53.81	2844	11E
210	07	LA	L29.795	B	PASADENA, ROSEMEAD BOULEVARD INTERCHANGE	268000	15651	5.84	4979	1504	875	8292	31.81	9.61	5.59	52.98	3302	11E
210	07	LA	R29.486	A	PASADENA, ROSEMEAD BOULEVARD INTERCHANGE	260000	16432	6.32	5227	1579	919	8706	31.81	9.61	5.59	52.98	3467	11E
210	07	LA	R36.41	B	DUARTE, JCT. RTE. 605, SAN GABRIEL RIVER FREEWAY INTERCHANGE	261000	20306	7.78	6772	1645	1350	10539	33.35	8.1	6.65	51.9	4223	11E
210	07	LA	R36.41	A	DUARTE, JCT. RTE. 605, SAN GABRIEL RIVER FREEWAY INTERCHANGE	266000	18434	6.93	5562	1101	413	11359	30.17	5.97	2.24	61.62	4276	11E
210	07	LA	R41.594	A	GLENDORA, GRAND AVENUE INTERCHANGE	244000	16763	6.87	5057	1001	375	10329	30.17	5.97	2.24	61.62	3888	11V
210	07	LA	R44.377	B	GLENDORA, JCT RTE 57, ORANGE FREEWAY INTERCHANGE	244000	16738	6.86	5050	999	375	10314	30.17	5.97	2.24	61.62	3882	11E
210	07	LA	R44.377	A	GLENDORA, JCT RTE 57, ORANGE FREEWAY INTERCHANGE	190000	6422	3.38	2032	673	234	3483	31.64	10.48	3.65	54.23	1369	11E
210	07	LA	R51.849	B	CLAREMONT, BASELINE ROAD INTERCHANGE	159000	6281	3.95	1987	658	229	3406	31.64	10.48	3.65	54.23	1339	11V
210	08	SBD	11.498	B	JCT RTE 15	156000	7301	4.68	2030	889	287	4096	27.8	12.17	3.93	56.1	1608	05E

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Freeway Mainline and Ramp
Peak Hour Volumes

Freeway Volumes - AM Peak Hour

I-605 Northbound

	Existing (2013)		Project	Cumulative	E+P	2016 NP	2016 WP	2035 NP	2035 WP
	Raw	Truck %	Total	Total	Total	Total	Total	Total	Total
S of Live Oak	6,132	6.79%	122	242	6,254	6,749	6,871	7,024	7,146
Off-Ramp (EB)	1,213	0%	122	56	1,335	1,343	1,465	1,398	1,520
Between	4,919	6.79%	0	186	4,919	5,406	5,406	5,626	5,626
Loop On-Ramp (EB)	248	0%	0	0	248	263	263	274	274
Between	5,167	6.79%	0	186	5,167	5,669	5,669	5,900	5,900
Slip On-Ramp (WB)	436	0%	150	36	586	499	649	518	668
N of Arrow	5,603	6.79%	150	222	5,753	6,168	6,318	6,418	6,568

I-605 Southbound

	Existing (2013)		Project	Cumulative	E+P	2016 NP	2016 WP	2035 NP	2035 WP
	Raw	Truck %	Total	Total	Total	Total	Total	Total	Total
N of Live Oak	4,471	6.79%	157	269	4,628	5,014	5,171	5,214	5,371
Slip Off-Ramp	816	0%	157	46	973	912	1,069	948	1,105
Between	3,655	6.79%	0	223	3,655	4,102	4,102	4,266	4,266
Slip On-Ramp	1,370	0%	114	50	1,484	1,504	1,618	1,565	1,679
S of Arrow	5,025	6.79%	114	273	5,139	5,606	5,720	5,831	5,945

I-210 Westbound

	Existing (2013)		Project	Cumulative	E+P	2016 NP	2016 WP	2035 NP	2035 WP
	Raw	Truck %	Total	Total	Total	Total	Total	Total	Total
E of Irwindale Av.	6,961	6.93%	101	355	7,062	7,742	7,843	8,054	8,155
Slip Off-Ramp (WB)	599	0%	5	43	604	679	684	705	710
Between	6,362	6.93%	96	312	6,458	7,063	7,159	7,349	7,445
Loop On-Ramp (WB)	540		0	30	540	603	603	627	627
Between	6,902		96	342	6,998	7,666	7,762	7,976	8,072
Slip On-Ramp	461	0%	0	0	461	489	489	510	510
W of Irwindale Av.	7,363	6.93%	96	342	7,459	8,155	8,251	8,486	8,582

I-210 Eastbound

	Existing (2013)		Project	Cumulative	E+P	2016 NP	2016 WP	2035 NP	2035 WP
	Raw	Truck %	Total	Total	Total	Total	Total	Total	Total
W of Irwindale Av.	7,500	6.93%	96	366	7,596	8,325	8,421	8,661	8,757
Off-Ramp (EB)	1,539	0%	0	43	1,539	1,676	1,676	1,745	1,745
Between	5,961	6.93%	96	323	6,057	6,649	6,745	6,916	7,012
Slip On-Ramp (WB)	485	0%	4	30	489	545	549	566	570
E of Irwindale Av.	6,446	6.93%	100	353	6,546	7,194	7,294	7,482	7,582

PeMS Data for Week of May 14-16, 2013 (consistent with daily count data).

Flow Conserved Volumes

Freeway Mainline Truck %: Based on 2011 Annual Average Daily Truck Traffic (Source: Caltrans)

I-605 = 6.79 %; I-210 = 6.93 % >>> HCS+ Input = 7% (rounded value)

Ramp Truck %: 0 (Ramp data are PCE volumes)

Freeway Volumes - PM Peak Hour

I-605 Northbound

	Existing (2013)		Project	Cumulative	E+P	2016 NP	2016 WP	2035 NP	2035 WP
	Raw	Truck %	Total	Total	Total	Total	Total	Total	Total
S of Live Oak	6,002	6.79%	129	317	6,131	6,686	6,815	6,955	7,084
Off-Ramp (EB)	1,251	0%	129	55	1,380	1,383	1,512	1,439	1,568
Between	4,751	6.79%	0	262	4,751	5,304	5,304	5,517	5,517
Loop On-Ramp (EB)	123	0%	0	2	123	133	133	138	138
Between	4,874	6.79%	0	264	4,874	5,437	5,437	5,655	5,655
Slip On-Ramp (WB)	297	0%	141	47	438	362	503	375	516
N of Arrow	5,171	6.79%	141	311	5,312	5,799	5,940	6,030	6,171

I-605 Southbound

	Existing (2013)		Project	Cumulative	E+P	2016 NP	2016 WP	2035 NP	2035 WP
	Raw	Truck %	Total	Total	Total	Total	Total	Total	Total
N of Live Oak	4,667	6.79%	142	285	4,809	5,238	5,380	5,447	5,589
Slip Off-Ramp	501	0%	142	46	643	578	720	600	742
Between	4,166	6.79%	0	239	4,166	4,660	4,660	4,847	4,847
Slip On-Ramp	1,553	0%	120	54	1,673	1,702	1,822	1,772	1,892
S of Arrow	5,719	6.79%	120	293	5,839	6,362	6,482	6,619	6,739

I-210 Westbound

	Existing (2013)		Project	Cumulative	E+P	2016 NP	2016 WP	2035 NP	2035 WP
	Raw	Truck %	Total	Total	Total	Total	Total	Total	Total
E of Irwindale Av.	7,043	6.93%	87	449	7,130	7,923	8,010	8,239	8,326
Slip Off-Ramp (WB)	523	0%	6	35	529	590	596	613	619
Between	6,520	6.93%	81	414	6,601	7,333	7,414	7,626	7,707
Loop On-Ramp (WB)	448		0	38	448	513	513	533	533
Between	6,968		81	452	7,049	7,846	7,927	8,159	8,240
Slip On-Ramp	283	0%	0	0	283	300	300	313	313
W of Irwindale Av.	7,251	6.93%	81	452	7,332	8,146	8,227	8,472	8,553

I-210 Eastbound

	Existing (2013)		Project	Cumulative	E+P	2016 NP	2016 WP	2035 NP	2035 WP
	Raw	Truck %	Total	Total	Total	Total	Total	Total	Total
W of Irwindale Av.	7,158	6.93%	82	528	7,240	8,124	8,206	8,445	8,527
Off-Ramp (EB)	822	0%	0	35	822	907	907	944	944
Between	6,336	6.93%	82	493	6,418	7,217	7,299	7,501	7,583
Slip On-Ramp (WB)	899	0%	5	38	904	992	997	1,032	1,037
E of Irwindale Av.	7,235	6.93%	87	531	7,322	8,209	8,296	8,533	8,620

PeMS Data for Week of May 14-16, 2013 (consistent with daily count data).

Flow Conserved Volumes

Freeway Mainline Truck %: Based on 2011 Annual Average Daily Truck Traffic (Source: Caltrans)

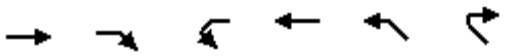
I-605 = 6.79 %; I-210 = 6.93 % >>> HCS+ Input = 7% (rounded value)

Ramp Truck %: 0 (Ramp data are PCE volumes)

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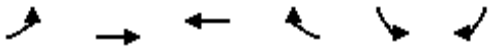
APPENDIX E

Existing (2013) Conditions
Intersection Analysis Worksheets



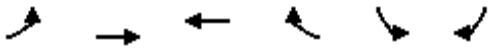
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	366	0	118	1191	1003	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	385	0	124	1254	1056	219
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	385	0	124	1254	1056	219
Turn Type	NA		Prot	NA	NA	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	43.7		7.4	55.1	36.9	100.0
Effective Green, g (s)	43.7		7.4	55.1	36.9	100.0
Actuated g/C Ratio	0.44		0.07	0.55	0.37	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1577		259	1989	1292	1615
v/s Ratio Prot	0.11		0.04	c0.35	c0.30	
v/s Ratio Perm						0.14
v/c Ratio	0.24		0.48	0.63	0.82	0.14
Uniform Delay, d1	17.7		44.4	15.4	28.5	0.0
Progression Factor	1.00		1.47	0.42	1.00	1.00
Incremental Delay, d2	0.4		0.6	1.2	4.1	0.2
Delay (s)	18.1		65.8	7.7	32.6	0.2
Level of Service	B		E	A	C	A
Approach Delay (s)	18.1			12.9	27.1	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	233	348	1171	533	98	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	271	405	1362	620	114	197
RTOR Reduction (vph)	0	0	0	241	0	179
Lane Group Flow (vph)	271	405	1362	379	114	18
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	80.5	59.5	59.5	9.0	9.0
Effective Green, g (s)	18.0	80.5	59.5	59.5	9.0	9.0
Actuated g/C Ratio	0.18	0.80	0.60	0.60	0.09	0.09
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2906	2147	960	315	145
v/s Ratio Prot	c0.15	0.11	c0.38		c0.03	
v/s Ratio Perm				0.23		0.01
v/c Ratio	0.84	0.14	0.63	0.39	0.36	0.12
Uniform Delay, d1	39.6	2.1	13.2	10.7	42.8	41.9
Progression Factor	0.73	1.29	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.1	0.1	1.4	1.2	0.7	0.4
Delay (s)	45.0	2.9	14.6	11.9	43.5	42.2
Level of Service	D	A	B	B	D	D
Approach Delay (s)		19.7	13.8		42.7	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	426	1269	0	384	432
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	490	1459	0	441	497
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	490	1459	0	441	497
Turn Type		NA	NA		NA	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		32.3	32.3		18.1	60.0
Effective Green, g (s)		32.3	32.3		18.1	60.0
Actuated g/C Ratio		0.54	0.54		0.30	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2792	1943		544	1615
v/s Ratio Prot		0.09	c0.40		c0.24	
v/s Ratio Perm						0.31
v/c Ratio		0.18	0.75		0.81	0.31
Uniform Delay, d1		7.1	10.7		19.4	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	2.7		8.9	0.5
Delay (s)		7.2	13.5		28.3	0.5
Level of Service		A	B		C	A
Approach Delay (s)		7.2	13.5		13.6	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	487	74	0	1269	436	0	0	43	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	513	78	0	1336	459	0	0	45	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked												
vC, conflicting volume	1336			591			1181	1848	256	1637	1926	668
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1336			591			1181	1848	256	1637	1926	668
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	94	100	100	100
cM capacity (veh/h)	523			995			148	75	749	64	67	406

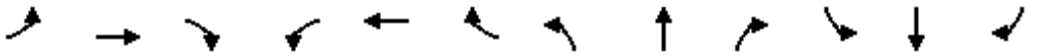
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	256	256	78	668	668	459	45
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	78	0	0	459	45
cSH	1700	1700	1700	1700	1700	1700	749
Volume to Capacity	0.15	0.15	0.05	0.39	0.39	0.27	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.1
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.1
Approach LOS							B

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	38.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	304	212	19	1568	166	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.56	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1057	3610	3502	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	323	226	20	1668	177	1
RTOR Reduction (vph)	0	43	0	0	0	1
Lane Group Flow (vph)	323	183	20	1668	177	0
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	81.1	81.1	81.1	81.1	10.4	10.4
Effective Green, g (s)	81.1	81.1	81.1	81.1	10.4	10.4
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.10	0.10
Clearance Time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	2927	1309	857	2927	364	167
v/s Ratio Prot	0.09			c0.46	c0.05	
v/s Ratio Perm		0.11	0.02			0.00
v/c Ratio	0.11	0.14	0.02	0.57	0.49	0.00
Uniform Delay, d1	2.0	2.0	1.8	3.3	42.3	40.1
Progression Factor	1.00	1.00	1.07	0.80	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.0	0.6	1.0	0.0
Delay (s)	2.0	2.2	2.0	3.2	43.3	40.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	2.1			3.2	43.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	63	9	114	132	9	3	2	98	2	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.85			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1805	3541		1805	3575		1805	1620			1756	
Flt Permitted	0.65	1.00		0.70	1.00		0.76	1.00			0.83	
Satd. Flow (perm)	1244	3541		1337	3575		1436	1620			1504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	68	10	124	143	10	3	2	107	2	0	1
RTOR Reduction (vph)	0	2	0	0	2	0	0	97	0	0	3	0
Lane Group Flow (vph)	8	76	0	124	151	0	3	12	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	47.0	47.0		47.0	47.0		5.5	5.5			5.5	
Effective Green, g (s)	47.0	47.0		47.0	47.0		5.5	5.5			5.5	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	974	2773		1047	2800		131	148			137	
v/s Ratio Prot		0.02			0.04			c0.01				
v/s Ratio Perm	0.01			c0.09			0.00				0.00	
v/c Ratio	0.01	0.03		0.12	0.05		0.02	0.08			0.00	
Uniform Delay, d1	1.4	1.4		1.6	1.5		24.8	24.9			24.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.0		0.2	0.0		0.1	0.2			0.0	
Delay (s)	1.4	1.5		1.8	1.5		24.9	25.2			24.8	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.5			1.6			25.2			24.8	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.11		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	278	567	803	1309	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	1.00	1.00
Adj. Flow (vph)	296	603	854	1393	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	296	603	854	1393	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	17.5	60.0	31.4	60.0		
Effective Green, g (s)	17.5	60.0	31.4	54.5		
Actuated g/C Ratio	0.29	1.00	0.52	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1052	1615	944	3279		
v/s Ratio Prot	0.08		c0.47	0.39		
v/s Ratio Perm		c0.37				
v/c Ratio	0.28	0.37	0.90	0.42		
Uniform Delay, d1	16.4	0.0	12.9	0.4		
Progression Factor	1.00	1.00	0.83	1.00		
Incremental Delay, d2	0.2	0.7	13.1	0.1		
Delay (s)	16.6	0.7	23.8	0.5		
Level of Service	B	A	C	A		
Approach Delay (s)	5.9			9.4	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	623	0	0	590	0	278	0	0	1522	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	663	0	0	628	0	296	0	0	1619	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.82	0.82	0.95	0.82	0.82	0.80	0.80			0.95		
vC, conflicting volume	1733	1915	148	2430	1915	810	1619			296		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1186	1407	0	2034	1407	251	1267			154		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	36	100	100	0	100			100		
cM capacity (veh/h)	0	115	1037	10	115	601	442			1367		

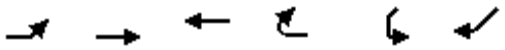
Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	663	628	148	148	810	810
Volume Left	0	0	0	0	0	0
Volume Right	663	628	0	0	0	0
cSH	1037	601	1700	1700	1700	1700
Volume to Capacity	0.64	1.04	0.09	0.09	0.48	0.48
Queue Length 95th (ft)	121	427	0	0	0	0
Control Delay (s)	14.4	74.8	0.0	0.0	0.0	0.0
Lane LOS	B	F				
Approach Delay (s)	14.4	74.8	0.0		0.0	
Approach LOS	B	F				

Intersection Summary				
Average Delay	17.6			
Intersection Capacity Utilization	85.3%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	816	84	25	1412	110	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3610	1615	1805	3610	1763	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	3610	1615	1805	3610	1763	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	859	88	26	1486	116	47
RTOR Reduction (vph)	0	19	0	0	33	0
Lane Group Flow (vph)	859	69	26	1486	130	0
Turn Type	NA	Perm	Prot	NA	NA	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	38.9	38.9	2.0	43.9	8.6	
Effective Green, g (s)	38.9	38.9	2.0	43.9	8.6	
Actuated g/C Ratio	0.65	0.65	0.03	0.73	0.14	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2340	1047	60	2641	252	
v/s Ratio Prot	0.24		0.01	c0.41	c0.07	
v/s Ratio Perm		0.04				
v/c Ratio	0.37	0.07	0.43	0.56	0.51	
Uniform Delay, d1	4.9	3.9	28.4	3.7	23.8	
Progression Factor	0.75	0.49	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1	1.8	0.9	1.8	
Delay (s)	4.1	2.0	30.3	4.5	25.5	
Level of Service	A	A	C	A	C	
Approach Delay (s)	3.9			5.0	25.5	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



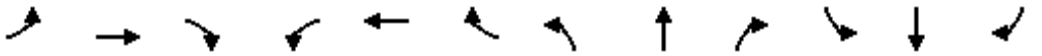
Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	72	789	1341	24	2	97
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	75	822	1397	25	2	101
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.75				0.80	0.75
vC, conflicting volume	1422				1958	698
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	907				1187	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				98	88
cM capacity (veh/h)	572				128	822

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	75	411	411	698	698	25	103
Volume Left	75	0	0	0	0	0	2
Volume Right	0	0	0	0	0	25	101
cSH	572	1700	1700	1700	1700	1700	741
Volume to Capacity	0.13	0.24	0.24	0.41	0.41	0.01	0.14
Queue Length 95th (ft)	11	0	0	0	0	0	12
Control Delay (s)	12.2	0.0	0.0	0.0	0.0	0.0	10.6
Lane LOS	B						B
Approach Delay (s)	1.0			0.0			10.6
Approach LOS							B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	42	680	69	220	1318	3	26	35	153	9	59	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3170		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3170		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	756	77	244	1464	3	29	39	170	10	66	22
RTOR Reduction (vph)	0	0	35	0	0	1	0	150	0	0	0	21
Lane Group Flow (vph)	47	756	42	244	1464	2	29	59	0	10	66	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	6.2	54.9	54.9	16.2	64.9	64.9	2.9	12.0		0.9	10.0	6.2
Effective Green, g (s)	6.2	54.9	54.9	16.2	64.9	64.9	2.9	12.0		0.9	10.0	6.2
Actuated g/C Ratio	0.06	0.55	0.55	0.16	0.65	0.65	0.03	0.12		0.01	0.10	0.06
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	111	1981	886	292	2342	1048	52	380		16	361	100
v/s Ratio Prot	0.03	0.21		c0.14	c0.41		c0.02	c0.02		0.01	0.02	
v/s Ratio Perm			0.03			0.00						0.00
v/c Ratio	0.42	0.38	0.05	0.84	0.63	0.00	0.56	0.16		0.62	0.18	0.01
Uniform Delay, d1	45.2	12.9	10.4	40.6	10.4	6.2	47.9	39.5		49.4	41.3	44.0
Progression Factor	1.00	1.00	1.00	1.33	0.36	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.6	0.1	14.8	1.0	0.0	7.2	0.3		44.0	0.4	0.0
Delay (s)	46.1	13.4	10.5	69.0	4.8	6.2	55.1	39.8		93.4	41.7	44.0
Level of Service	D	B	B	E	A	A	E	D		F	D	D
Approach Delay (s)		14.9			14.0			41.7			47.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



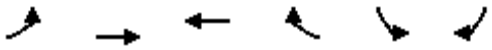
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	603	38	31	1488	17	19	79	22	8	20	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1838		1805	1900	1615
Flt Permitted	0.11	1.00	1.00	0.39	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (perm)	213	3610	1615	748	3610	1615		1838		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	13	648	41	33	1600	18	20	85	24	9	22	86
RTOR Reduction (vph)	0	0	9	0	0	5	0	10	0	0	0	81
Lane Group Flow (vph)	13	648	32	33	1600	13	0	119	0	9	22	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	71.8	71.8	71.8	71.8	71.8	71.8		11.8		5.9	5.9	5.9
Effective Green, g (s)	71.8	71.8	71.8	71.8	71.8	71.8		11.8		5.9	5.9	5.9
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.72		0.12		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	152	2591	1159	537	2591	1159		216		106	112	95
v/s Ratio Prot		0.18			c0.44			c0.06		0.00	c0.01	
v/s Ratio Perm	0.06		0.02	0.04		0.01						0.00
v/c Ratio	0.09	0.25	0.03	0.06	0.62	0.01		0.55		0.08	0.20	0.05
Uniform Delay, d1	4.2	4.8	4.1	4.2	7.1	4.0		41.6		44.5	44.8	44.4
Progression Factor	1.31	1.16	1.57	0.65	0.54	0.26		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	0.0	0.2	1.0	0.0		3.0		0.3	0.9	0.2
Delay (s)	6.6	5.8	6.4	2.9	4.8	1.1		44.6		44.8	45.7	44.6
Level of Service	A	A	A	A	A	A		D		D	D	D
Approach Delay (s)		5.9			4.7			44.6			44.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	593	56	122	1390	206	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.0	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	645	61	133	1511	224	180
RTOR Reduction (vph)	0	18	0	0	0	77
Lane Group Flow (vph)	645	43	133	1511	224	103
Turn Type	NA	Perm	Prot	NA	NA	custom
Protected Phases	2		1	6	4	
Permitted Phases		2				2
Actuated Green, G (s)	57.0	57.0	19.0	80.0	11.5	57.0
Effective Green, g (s)	57.0	57.0	19.0	80.0	11.5	57.0
Actuated g/C Ratio	0.57	0.57	0.19	0.80	0.12	0.57
Clearance Time (s)	4.5	4.5	4.0	4.5	4.0	4.5
Vehicle Extension (s)	4.5	4.5	3.0	4.5	3.0	4.5
Lane Grp Cap (vph)	2057	920	342	2888	402	920
v/s Ratio Prot	0.18		0.07	c0.42	c0.06	
v/s Ratio Perm		0.03				0.06
v/c Ratio	0.31	0.05	0.39	0.52	0.56	0.11
Uniform Delay, d1	11.3	9.5	35.4	3.4	41.8	9.9
Progression Factor	1.26	1.65	0.93	0.65	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.7	0.6	1.7	0.2
Delay (s)	14.5	15.8	33.7	2.9	43.5	10.1
Level of Service	B	B	C	A	D	B
Approach Delay (s)	14.6			5.4	28.6	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	70	645	1451	0	244	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	285	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	72	665	1496	0	252	63
RTOR Reduction (vph)	0	0	0	0	0	46
Lane Group Flow (vph)	72	665	1496	0	252	17
Turn Type	Perm	NA	NA		NA	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	80.0	80.0	80.0		12.5	12.5
Effective Green, g (s)	80.0	80.0	80.0		12.5	12.5
Actuated g/C Ratio	0.80	0.80	0.80		0.12	0.12
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	228	2888	2888		437	201
v/s Ratio Prot		0.18	c0.41		c0.07	
v/s Ratio Perm	0.25					0.01
v/c Ratio	0.32	0.23	0.52		0.58	0.08
Uniform Delay, d1	2.7	2.5	3.4		41.3	38.7
Progression Factor	1.16	0.59	0.53		0.97	0.96
Incremental Delay, d2	3.5	0.2	0.4		1.8	0.2
Delay (s)	6.6	1.6	2.2		41.7	37.2
Level of Service	A	A	A		D	D
Approach Delay (s)		2.1	2.2		40.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

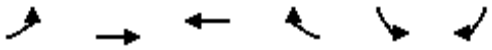


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	816	128	77	2402	565	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.28	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	539	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	877	138	83	2583	608	80
RTOR Reduction (vph)	0	32	0	0	0	28
Lane Group Flow (vph)	877	106	83	2583	608	52
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	350	3371	945	436
v/s Ratio Prot	0.24			c0.50	c0.17	
v/s Ratio Perm		0.07	0.15			0.03
v/c Ratio	0.37	0.10	0.24	0.77	0.64	0.12
Uniform Delay, d1	8.1	6.6	7.2	12.2	32.2	27.5
Progression Factor	0.27	0.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	1.6	1.7	3.4	0.6
Delay (s)	2.7	0.2	8.8	13.9	35.6	28.1
Level of Service	A	A	A	B	D	C
Approach Delay (s)	2.3			13.8	34.7	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

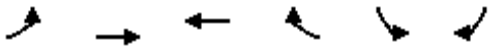
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	540	0	190	443	762	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	562	0	198	461	794	106
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	562	0	198	461	794	106
Turn Type	NA		Prot	NA	NA	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	48.3		10.6	62.9	29.1	100.0
Effective Green, g (s)	48.3		10.6	62.9	29.1	100.0
Actuated g/C Ratio	0.48		0.11	0.63	0.29	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1743		371	2270	1019	1615
v/s Ratio Prot	c0.16		c0.06	0.13	c0.23	
v/s Ratio Perm						0.07
v/c Ratio	0.32		0.53	0.20	0.78	0.07
Uniform Delay, d1	15.8		42.4	7.9	32.5	0.0
Progression Factor	1.00		1.27	0.65	1.00	1.00
Incremental Delay, d2	0.5		0.9	0.2	3.8	0.1
Delay (s)	16.3		54.6	5.3	36.3	0.1
Level of Service	B		D	A	D	A
Approach Delay (s)	16.3			20.1	32.1	
Approach LOS	B			C	C	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



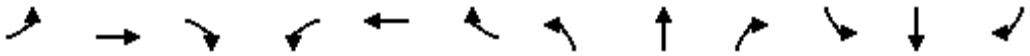
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	203	463	382	165	347	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	245	558	460	199	418	263
RTOR Reduction (vph)	0	0	0	98	0	217
Lane Group Flow (vph)	245	558	460	101	418	46
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	72.0	51.0	51.0	17.5	17.5
Effective Green, g (s)	18.0	72.0	51.0	51.0	17.5	17.5
Actuated g/C Ratio	0.18	0.72	0.51	0.51	0.18	0.18
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2599	1841	823	612	282
v/s Ratio Prot	c0.14	0.15	c0.13		c0.12	
v/s Ratio Perm				0.06		0.03
v/c Ratio	0.76	0.21	0.25	0.12	0.68	0.16
Uniform Delay, d1	38.9	4.6	13.8	12.8	38.7	35.0
Progression Factor	0.75	1.32	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	0.2	0.3	0.3	3.1	0.3
Delay (s)	37.7	6.3	14.1	13.1	41.8	35.3
Level of Service	D	A	B	B	D	D
Approach Delay (s)		15.9	13.8		39.3	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	800	320	0	271	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	909	364	0	308	261
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	909	364	0	308	261
Turn Type		NA	NA		NA	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		35.3	35.3		15.1	60.0
Effective Green, g (s)		35.3	35.3		15.1	60.0
Actuated g/C Ratio		0.59	0.59		0.25	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		3051	2123		454	1615
v/s Ratio Prot		c0.18	0.10		c0.17	
v/s Ratio Perm						0.16
v/c Ratio		0.30	0.17		0.68	0.16
Uniform Delay, d1		6.2	5.7		20.3	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.2		4.0	0.2
Delay (s)		6.4	5.8		24.3	0.2
Level of Service		A	A		C	A
Approach Delay (s)		6.4	5.8		13.2	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	915	33	0	320	297	0	0	24	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	963	35	0	337	313	0	0	25	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	337			998			1132	1300	482	844	1335	168
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	337			806			953	1137	241	637	1175	168
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	96	100	100	100
cM capacity (veh/h)	1234			755			198	186	700	322	176	852

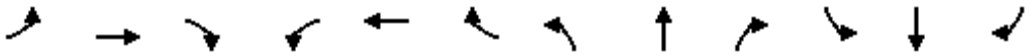
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	482	482	35	168	168	313	25
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	35	0	0	313	25
cSH	1700	1700	1700	1700	1700	1700	700
Volume to Capacity	0.28	0.28	0.02	0.10	0.10	0.18	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.3
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.3
Approach LOS							B

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	35.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	812	143	0	446	154	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	3.0	3.0
Lane Util. Factor	0.95	1.00		0.95	0.97	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3610	1615		3610	3502	1615
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	3610	1615		3610	3502	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	892	157	0	490	169	15
RTOR Reduction (vph)	0	29	0	0	0	13
Lane Group Flow (vph)	892	128	0	490	169	2
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	81.3	81.3		81.3	10.2	10.2
Effective Green, g (s)	81.3	81.3		81.3	10.2	10.2
Actuated g/C Ratio	0.81	0.81		0.81	0.10	0.10
Clearance Time (s)	5.5	5.5		5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0		2.0	3.0	3.0
Lane Grp Cap (vph)	2934	1312		2934	357	164
v/s Ratio Prot	c0.25			0.14	c0.05	
v/s Ratio Perm		0.08				0.00
v/c Ratio	0.30	0.10		0.17	0.47	0.01
Uniform Delay, d1	2.3	1.9		2.0	42.4	40.4
Progression Factor	1.00	1.00		0.87	1.00	1.00
Incremental Delay, d2	0.3	0.1		0.1	1.0	0.0
Delay (s)	2.6	2.0		1.9	43.4	40.4
Level of Service	A	A		A	D	D
Approach Delay (s)	2.5			1.9	43.1	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	82	16	85	33	2	7	0	73	6	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	
Frt		0.98		1.00	0.99		1.00	0.85			0.92	
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)		3520		1805	3585		1805	1615			1740	
Flt Permitted		1.00		0.68	1.00		1.00	1.00			0.94	
Satd. Flow (perm)		3520		1283	3585		1900	1615			1654	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	0	101	20	105	41	2	9	0	90	7	12	25
RTOR Reduction (vph)	0	4	0	0	0	0	0	82	0	0	23	0
Lane Group Flow (vph)	0	117	0	105	43	0	9	8	0	0	21	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)		47.1		47.1	47.1		5.4	5.4			5.4	
Effective Green, g (s)		47.1		47.1	47.1		5.4	5.4			5.4	
Actuated g/C Ratio		0.79		0.79	0.79		0.09	0.09			0.09	
Clearance Time (s)		4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)		2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		2763		1007	2814		171	145			148	
v/s Ratio Prot		0.03			0.01			0.01				
v/s Ratio Perm				c0.08			0.00				c0.01	
v/c Ratio		0.04		0.10	0.02		0.05	0.06			0.14	
Uniform Delay, d1		1.4		1.5	1.4		25.0	25.0			25.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.0		0.2	0.0		0.1	0.2			0.4	
Delay (s)		1.5		1.7	1.4		25.1	25.1			25.6	
Level of Service		A		A	A		C	C			C	
Approach Delay (s)		1.5			1.6			25.1			25.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.11		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	25.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	904	946	607	875	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	952	996	639	921	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	952	996	639	921	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.51	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	c0.26		0.35	0.26		
v/s Ratio Perm		c0.62				
v/c Ratio	0.88	0.62	0.69	0.28		
Uniform Delay, d1	20.0	0.0	10.9	0.3		
Progression Factor	1.00	1.00	0.96	1.00		
Incremental Delay, d2	8.5	1.8	4.1	0.1		
Delay (s)	28.5	1.8	14.6	0.4		
Level of Service	C	A	B	A		
Approach Delay (s)	14.8			6.2	0.0	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	691	0	0	560	0	904	0	0	922	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	712	0	0	577	0	932	0	0	951	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.77	0.77	0.75	0.77	0.77	0.95	0.95			0.75		
vC, conflicting volume	1985	1882	466	2129	1882	475	951			932		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1384	1252	0	1571	1252	337	838			233		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	13	100	100	8	100			100		
cM capacity (veh/h)	7	134	815	7	134	630	763			1007		

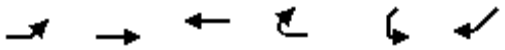
Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	712	577	466	466	475	475
Volume Left	0	0	0	0	0	0
Volume Right	712	577	0	0	0	0
cSH	815	630	1700	1700	1700	1700
Volume to Capacity	0.87	0.92	0.27	0.27	0.28	0.28
Queue Length 95th (ft)	278	294	0	0	0	0
Control Delay (s)	31.5	43.9	0.0	0.0	0.0	0.0
Lane LOS	D	E				
Approach Delay (s)	31.5	43.9	0.0		0.0	
Approach LOS	D	E				

Intersection Summary				
Average Delay	15.0			
Intersection Capacity Utilization	74.4%	ICU Level of Service		D
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1576	19	0	915	7	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	3.0	
Lane Util. Factor	0.95	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	0.91	
Flt Protected	1.00	1.00		1.00	0.99	
Satd. Flow (prot)	3610	1615		3610	1696	
Flt Permitted	1.00	1.00		1.00	0.99	
Satd. Flow (perm)	3610	1615		3610	1696	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1659	20	0	963	7	16
RTOR Reduction (vph)	0	1	0	0	16	0
Lane Group Flow (vph)	1659	19	0	963	7	0
Turn Type	NA	Perm	Prot	NA	NA	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	51.0	51.0		51.0	1.5	
Effective Green, g (s)	51.0	51.0		51.0	1.5	
Actuated g/C Ratio	0.85	0.85		0.85	0.02	
Clearance Time (s)	4.5	4.5		4.5	3.0	
Vehicle Extension (s)	3.5	3.5		4.5	3.0	
Lane Grp Cap (vph)	3068	1372		3068	42	
v/s Ratio Prot	c0.46			0.27	c0.00	
v/s Ratio Perm		0.01				
v/c Ratio	0.54	0.01		0.31	0.18	
Uniform Delay, d1	1.2	0.7		0.9	28.6	
Progression Factor	1.37	0.38		1.00	1.00	
Incremental Delay, d2	0.6	0.0		0.3	2.0	
Delay (s)	2.3	0.3		1.2	30.7	
Level of Service	A	A		A	C	
Approach Delay (s)	2.3			1.2	30.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	29	1562	867	3	8	48
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	1698	942	3	9	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.91				0.89	0.91
vC, conflicting volume	946				1854	471
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	735				1235	212
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				94	93
cM capacity (veh/h)	798				146	725

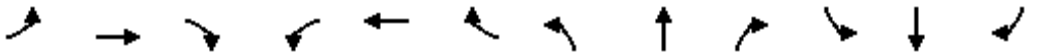
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	32	849	849	471	471	3	61
Volume Left	32	0	0	0	0	0	9
Volume Right	0	0	0	0	0	3	52
cSH	798	1700	1700	1700	1700	1700	463
Volume to Capacity	0.04	0.50	0.50	0.28	0.28	0.00	0.13
Queue Length 95th (ft)	3	0	0	0	0	0	11
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	14.0
Lane LOS	A						B
Approach Delay (s)	0.2			0.0			14.0
Approach LOS							B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	11	1542	17	69	753	14	89	58	372	0	11	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5			5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95			0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3141			3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3141			3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	1713	19	77	837	16	99	64	413	0	12	31
RTOR Reduction (vph)	0	0	7	0	0	5	0	349	0	0	0	30
Lane Group Flow (vph)	12	1713	12	77	837	11	99	128	0	0	12	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	3.5	65.2	65.2	6.3	68.0	68.0	10.7	15.5			1.8	3.5
Effective Green, g (s)	3.5	65.2	65.2	6.3	68.0	68.0	10.7	15.5			1.8	3.5
Actuated g/C Ratio	0.04	0.65	0.65	0.06	0.68	0.68	0.11	0.16			0.02	0.04
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5			5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5			4.5	2.0
Lane Grp Cap (vph)	63	2353	1052	113	2454	1098	193	486			64	56
v/s Ratio Prot	0.01	c0.47		c0.04	c0.23		c0.05	c0.04			0.00	
v/s Ratio Perm			0.01			0.01						0.00
v/c Ratio	0.19	0.73	0.01	0.68	0.34	0.01	0.51	0.26			0.19	0.02
Uniform Delay, d1	46.9	11.5	6.1	45.9	6.7	5.2	42.2	37.2			48.4	46.6
Progression Factor	1.00	1.00	1.00	1.09	0.56	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.5	2.0	0.0	12.4	0.4	0.0	1.0	0.5			2.4	0.1
Delay (s)	47.4	13.5	6.1	62.3	4.1	5.2	43.1	37.7			50.8	46.6
Level of Service	D	B	A	E	A	A	D	D			D	D
Approach Delay (s)		13.7			8.9			38.7			47.8	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

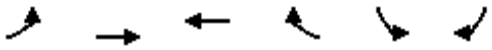


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	1934	186	41	708	11	50	28	19	36	71	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1804		1805	1900	1615
Flt Permitted	0.34	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	652	3610	1615	107	3610	1615		1804		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	49	2080	200	44	761	12	54	30	20	39	76	18
RTOR Reduction (vph)	0	0	10	0	0	4	0	11	0	0	0	17
Lane Group Flow (vph)	49	2080	190	44	761	8	0	93	0	39	76	1
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	70.8	70.8	70.8	70.8	70.8	70.8		10.5		8.2	8.2	8.2
Effective Green, g (s)	70.8	70.8	70.8	70.8	70.8	70.8		10.5		8.2	8.2	8.2
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71		0.10		0.08	0.08	0.08
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	461	2555	1143	75	2555	1143		189		148	155	132
v/s Ratio Prot		c0.58			0.21			c0.05		0.02	c0.04	
v/s Ratio Perm	0.08		0.12	0.41		0.01						0.00
v/c Ratio	0.11	0.81	0.17	0.59	0.30	0.01		0.49		0.26	0.49	0.01
Uniform Delay, d1	4.6	10.1	4.8	7.3	5.4	4.3		42.2		43.1	43.9	42.2
Progression Factor	1.23	0.88	1.22	1.13	0.67	0.47		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	2.5	0.3	29.0	0.3	0.0		2.0		1.0	2.4	0.0
Delay (s)	6.1	11.3	6.2	37.2	3.9	2.0		44.3		44.0	46.3	42.2
Level of Service	A	B	A	D	A	A		D		D	D	D
Approach Delay (s)		10.8			5.7			44.3			45.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1642	361	223	678	77	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.0	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1785	392	242	737	84	126
RTOR Reduction (vph)	0	38	0	0	0	48
Lane Group Flow (vph)	1785	354	242	737	84	78
Turn Type	NA	Perm	Prot	NA	NA	custom
Protected Phases	2		1	6	4	
Permitted Phases		2				2
Actuated Green, G (s)	61.9	61.9	19.0	84.9	6.6	61.9
Effective Green, g (s)	61.9	61.9	19.0	84.9	6.6	61.9
Actuated g/C Ratio	0.62	0.62	0.19	0.85	0.07	0.62
Clearance Time (s)	4.5	4.5	4.0	4.5	4.0	4.5
Vehicle Extension (s)	4.5	4.5	3.0	4.5	3.0	4.5
Lane Grp Cap (vph)	2234	999	342	3064	231	999
v/s Ratio Prot	c0.49		c0.13	0.20	c0.02	
v/s Ratio Perm		0.22				0.05
v/c Ratio	0.80	0.35	0.71	0.24	0.36	0.08
Uniform Delay, d1	14.4	9.3	37.9	1.4	44.7	7.6
Progression Factor	1.18	1.62	0.89	1.10	1.00	1.00
Incremental Delay, d2	1.9	0.6	6.3	0.2	1.0	0.2
Delay (s)	18.9	15.6	39.9	1.8	45.7	7.8
Level of Service	B	B	D	A	D	A
Approach Delay (s)	18.3			11.2	22.9	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	41	1738	793	0	718	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.30	1.00	1.00		0.95	1.00
Satd. Flow (perm)	564	3610	3610		3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	1889	862	0	780	117
RTOR Reduction (vph)	0	0	0	0	0	85
Lane Group Flow (vph)	45	1889	862	0	780	32
Turn Type	Perm	NA	NA		NA	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	67.3	67.3	67.3		25.2	25.2
Effective Green, g (s)	67.3	67.3	67.3		25.2	25.2
Actuated g/C Ratio	0.67	0.67	0.67		0.25	0.25
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	379	2429	2429		882	406
v/s Ratio Prot		c0.52	0.24		c0.22	
v/s Ratio Perm	0.08					0.02
v/c Ratio	0.12	0.78	0.35		0.88	0.08
Uniform Delay, d1	5.8	11.2	7.0		36.0	28.6
Progression Factor	0.69	1.56	1.25		0.93	0.89
Incremental Delay, d2	0.4	1.7	0.4		10.2	0.1
Delay (s)	4.5	19.2	9.1		43.9	25.6
Level of Service	A	B	A		D	C
Approach Delay (s)		18.8	9.1		41.5	
Approach LOS		B	A		D	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2088	345	68	982	216	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	117	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	2245	371	73	1056	232	99
RTOR Reduction (vph)	0	34	0	0	0	7
Lane Group Flow (vph)	2245	337	73	1056	232	92
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	76	3371	945	436
v/s Ratio Prot	0.62			0.20	c0.07	
v/s Ratio Perm		0.21	c0.62			0.06
v/c Ratio	0.96	0.32	0.96	0.31	0.25	0.21
Uniform Delay, d1	16.2	7.7	16.3	7.7	28.5	28.3
Progression Factor	0.87	1.14	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	0.5	92.7	0.2	0.6	1.1
Delay (s)	21.4	9.3	109.0	7.9	29.2	29.4
Level of Service	C	A	F	A	C	C
Approach Delay (s)	19.7			14.5	29.2	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

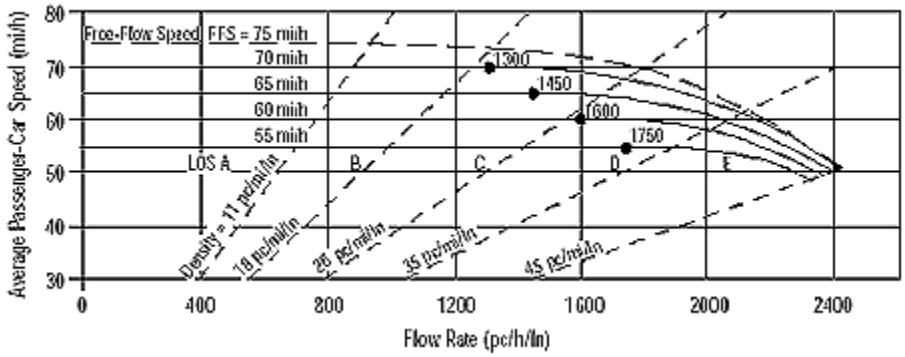
Existing (2013) Conditions
HCS+ Freeway Segment, HCS+ Ramp Junction,
and Queuing Analysis Worksheets

HCS+ Freeway Segment Analysis Worksheets

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I-605 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*06/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6132*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1725*	pc/h/ln
S	*68.6*	mi/h
D = v_p / S	*25.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

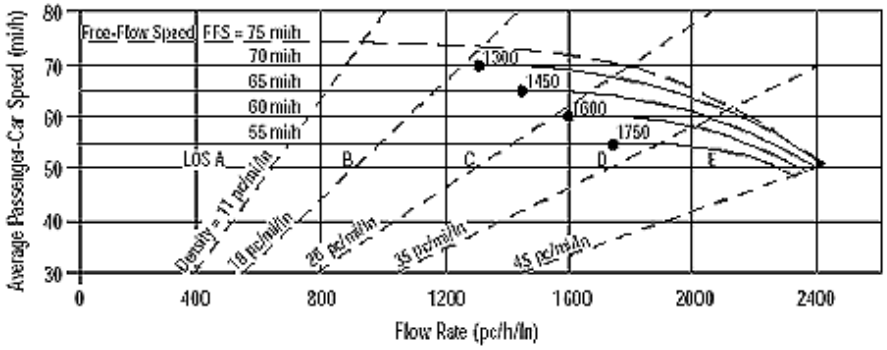
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*06/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4919*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1383*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*19.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

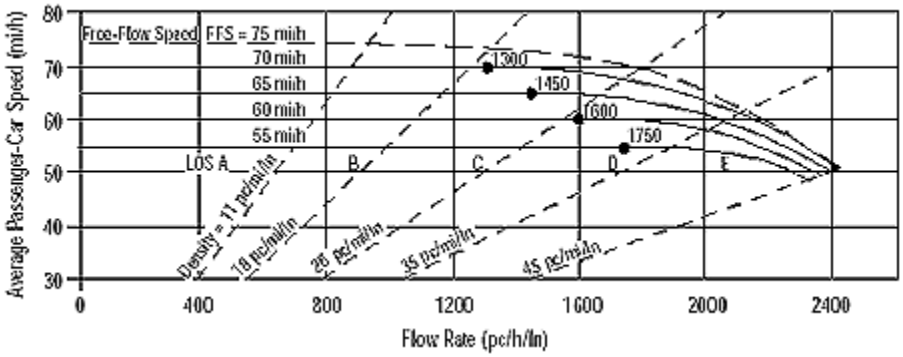
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW EB Arrw Lp On and WB On*
Date Performed	*06/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5167*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1453*	pc/h/ln	Design LOS		
S	*69.9*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*20.8*	pc/mi/ln	S		mi/h
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

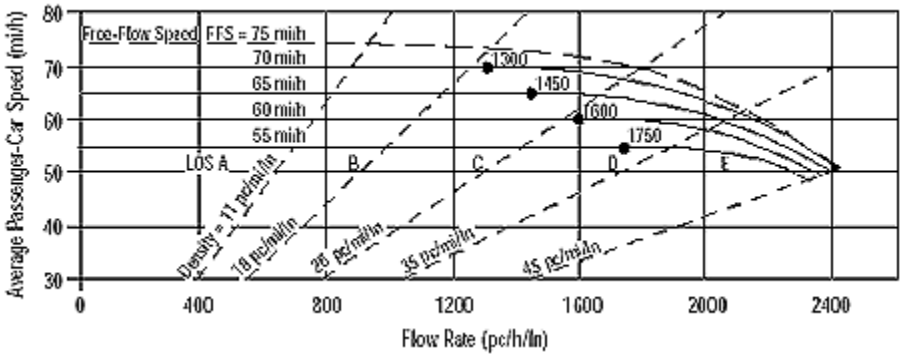
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5603*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

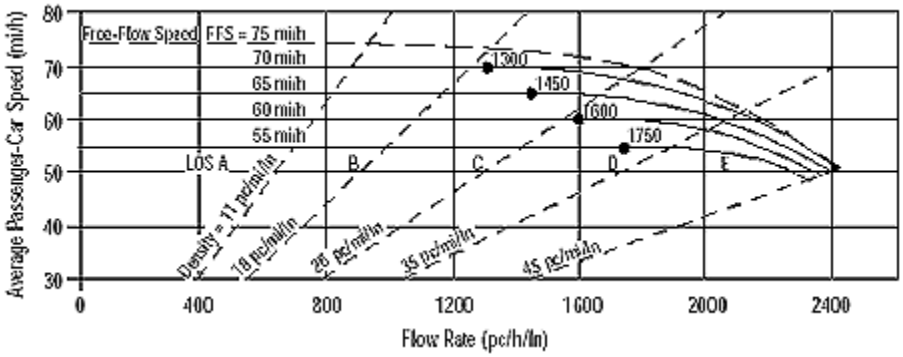
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1576*	pc/h/ln	Design LOS		
S	*69.5*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*22.7*	pc/mi/ln	S		mi/h
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4471*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1257*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*18.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

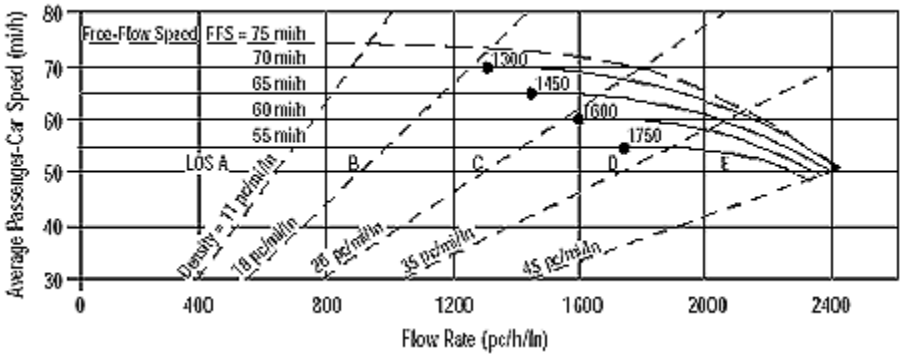
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3655*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1028*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*14.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

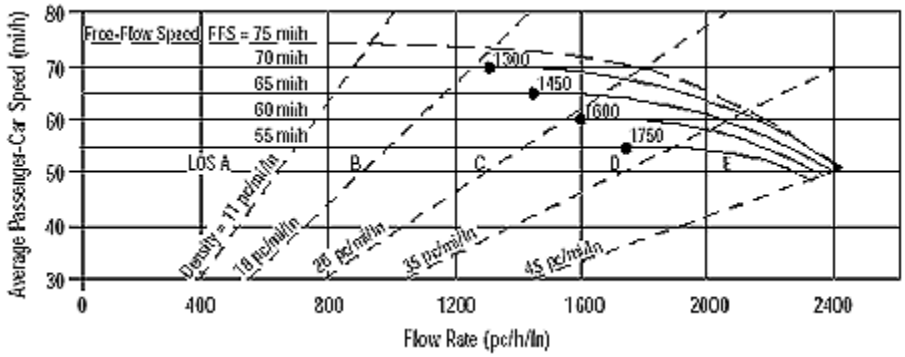
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5025*	veh/h	Peak-Hour Factor, PHF	
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1413*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*20.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

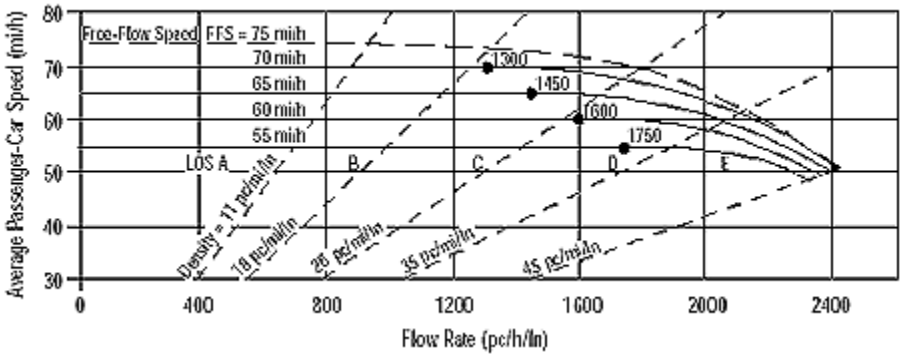
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6002*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1688*	pc/h/ln
S	*68.9*	mi/h
D = v_p / S	*24.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

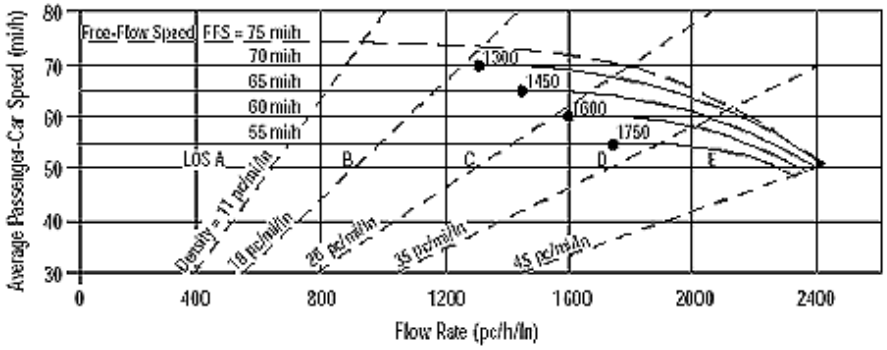
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4751*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1336*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*19.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

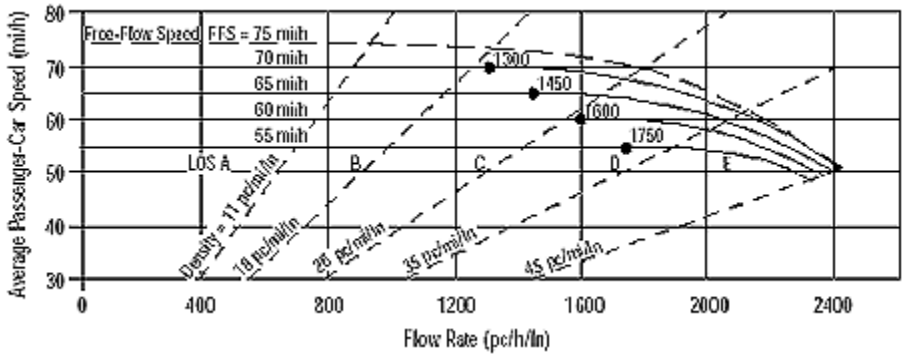
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4874*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1371*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*19.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

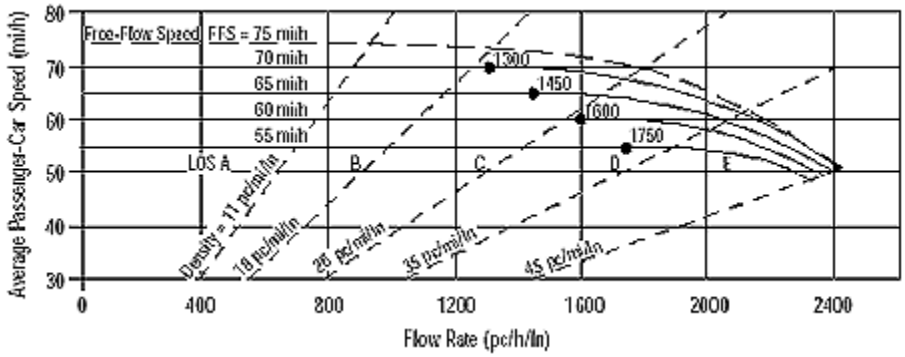
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5171*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1454*	pc/h/ln
S	*69.9*	mi/h
D = v_p / S	*20.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

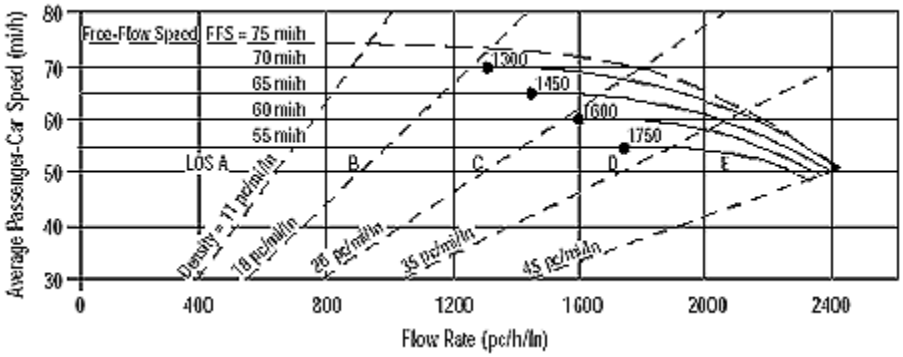
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4667*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1313*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*18.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

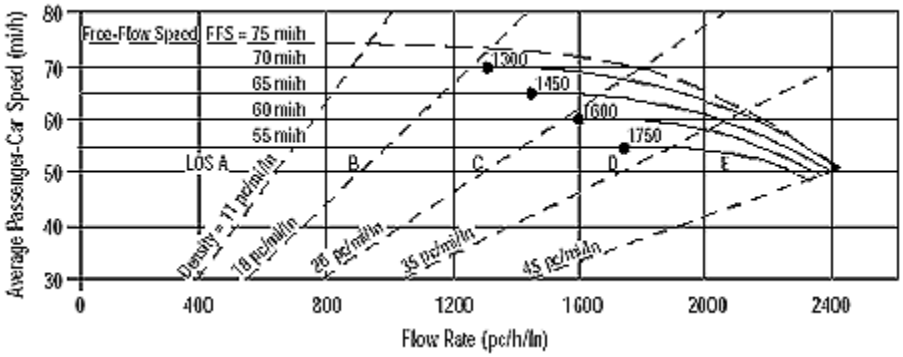
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4166*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1172*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*16.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

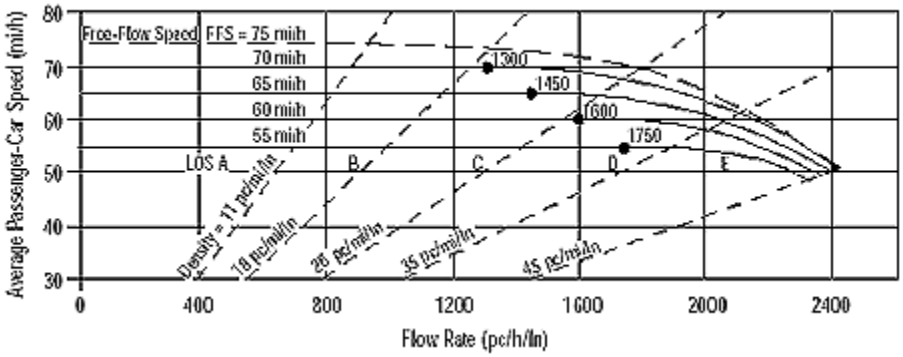
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5719*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1608*	pc/h/ln
S	*69.4*	mi/h
D = v_p / S	*23.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

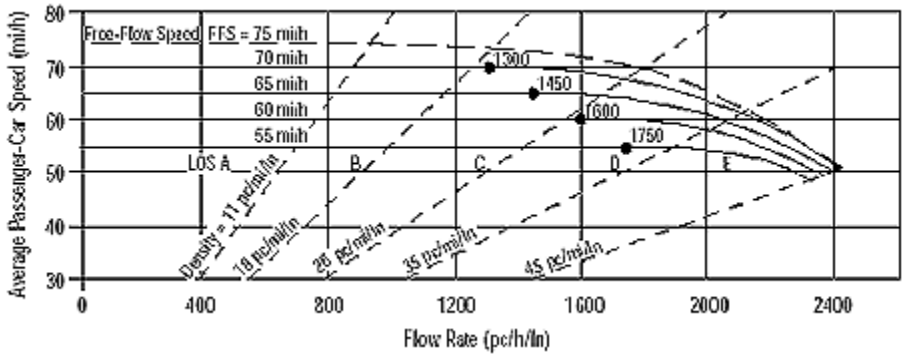
Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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I-210 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*East of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6961*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1958*	pc/h/ln
S	*65.6*	mi/h
D = v_p / S	*29.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

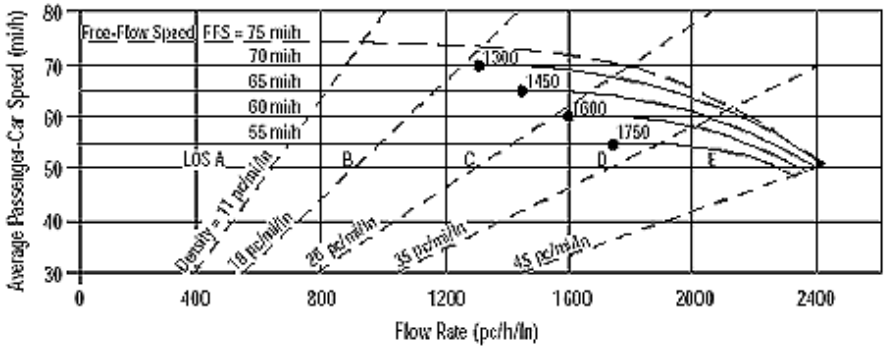
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*BW Irwindale Off & Loop OnRamp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6362*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1789*	pc/h/ln
S	*68.0*	mi/h
D = v_p / S	*26.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

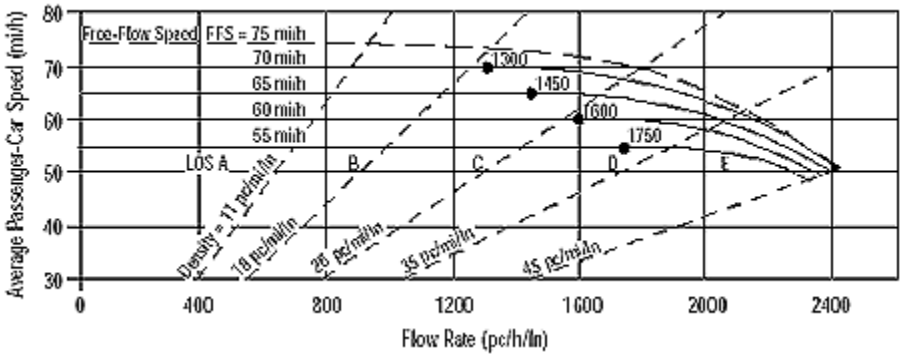
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7363*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2071*	pc/h/ln
S	*63.4*	mi/h
D = v_p / S	*32.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

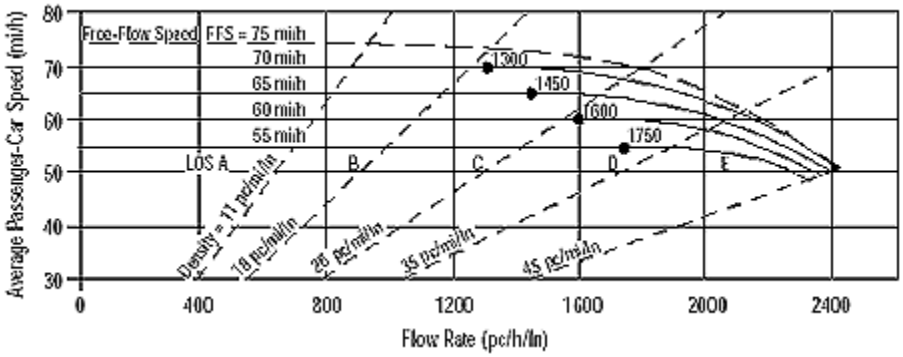
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7500*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2109*	pc/h/ln
S	*62.5*	mi/h
D = v_p / S	*33.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

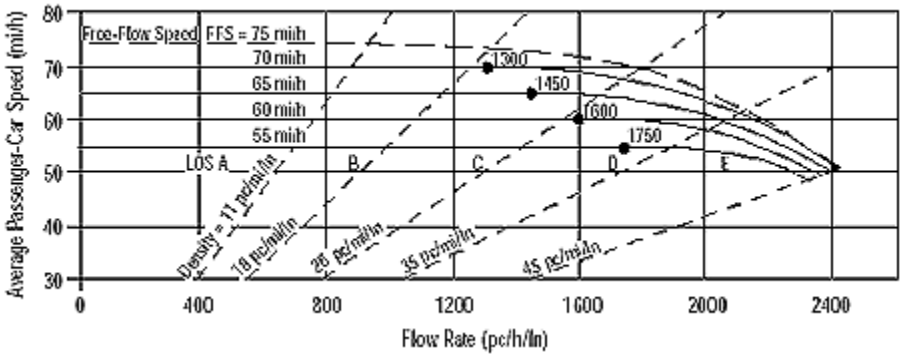
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*BW Irwindale Off & On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5961*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1677*	pc/h/ln
S	*69.0*	mi/h
D = v_p / S	*24.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

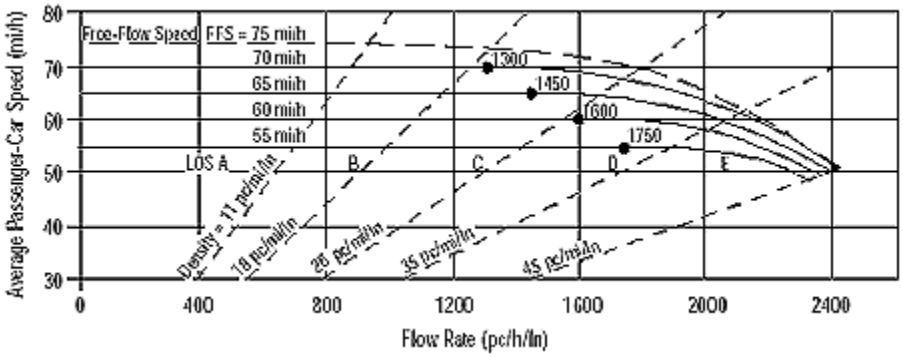
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6446*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1813*	pc/h/ln
S	*67.7*	mi/h
D = v_p / S	*26.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

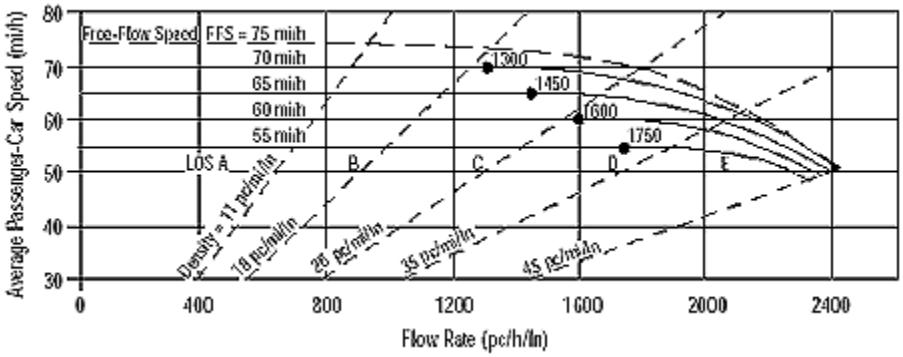
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7043*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1981*	pc/h/ln
S	*65.2*	mi/h
D = v_p / S	*30.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

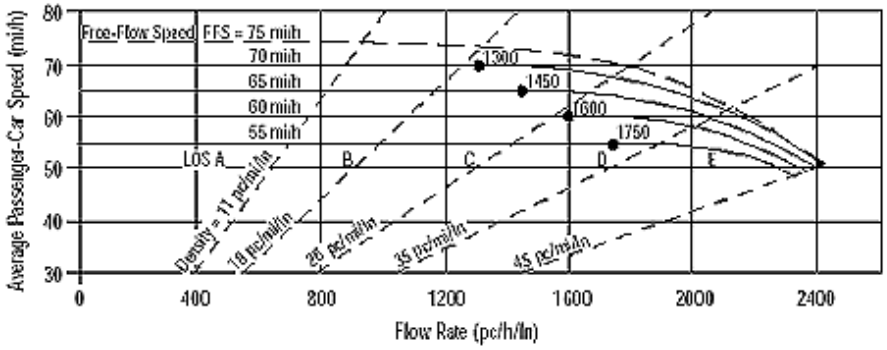
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6520*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1834*	pc/h/ln
S	*67.5*	mi/h
D = v_p / S	*27.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

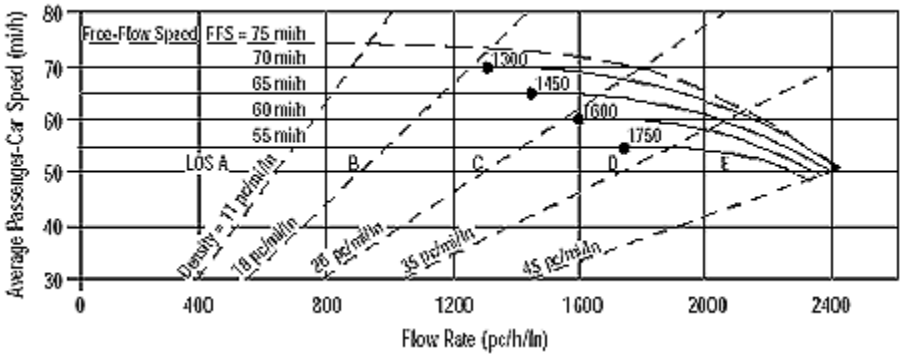
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*West of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7251*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2039*	pc/h/ln
S	*64.1*	mi/h
D = v_p / S	*31.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

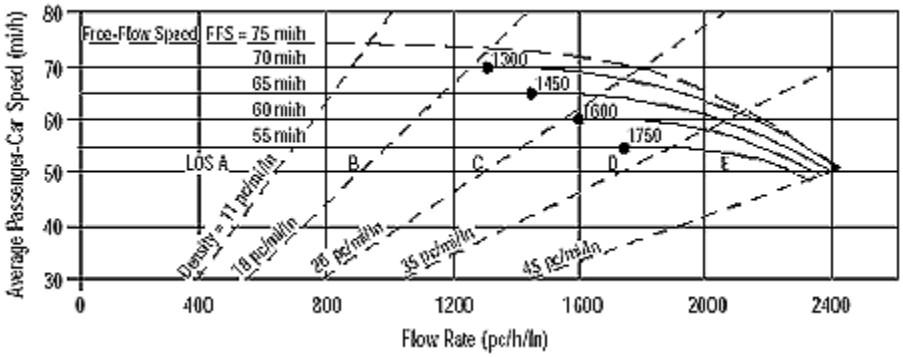
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*West of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7158*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2013*	pc/h/ln
S	*64.6*	mi/h
D = v_p / S	*31.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

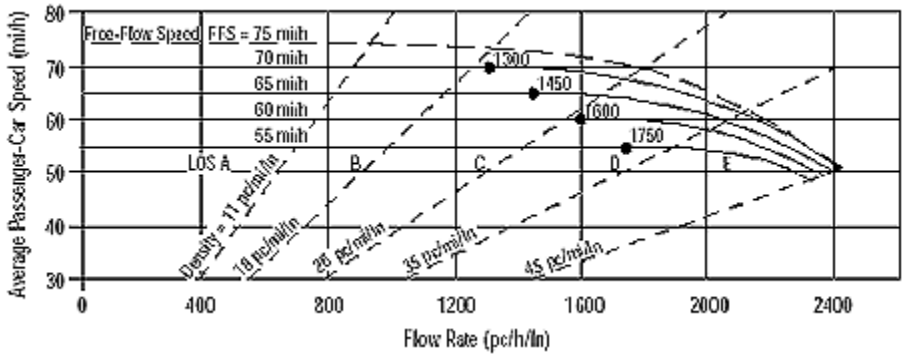
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*BW Irwindale Off & On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6336*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1782*	pc/h/ln
S	*68.0*	mi/h
D = v_p / S	*26.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

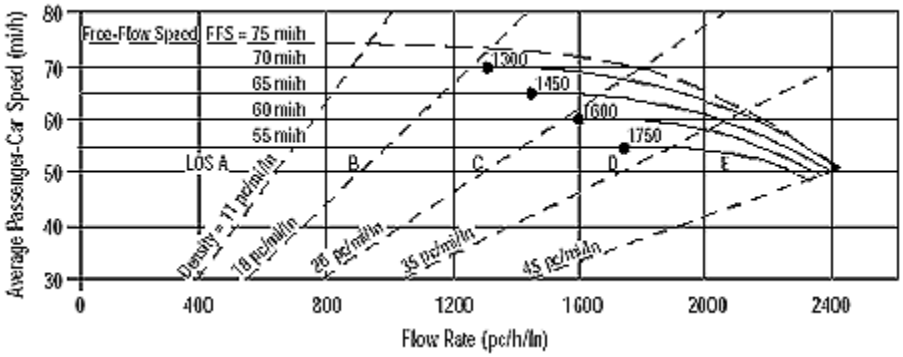
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7235*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2035*	pc/h/ln	Design LOS		
S	*64.2*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*31.7*	pc/mi/ln	S		mi/h
LOS	*D*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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HCS+ Ramp Junction Analysis Worksheets

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I-605 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 248 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6132	0.92	Level	7	0	0.966	1.00	6898
Ramp	1213	0.92	Level	0	0	1.000	1.00	1318
UpStream								
DownStream	248	0.92	Level	0	0	1.000	1.00	270

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3751 pc/h
V_3 or V_{av34} 1573 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6898	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5580	Exhibit 25-14	9600	No
V_R	1318	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3751	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 34.2 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.547 (Exhibit 25-19)
S_R= 54.7 mph (Exhibit 25-19)
S_0= 74.6 mph (Exhibit 25-19)
S = 62.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 436 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4919	0.92	Level	7	0	0.966	1.00	5534
Ramp	248	0.92	Level	0	0	1.000	1.00	270
UpStream								
DownStream	436	0.92	Level	0	0	1.000	1.00	474

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.407 using Equation (Exhibit 25-5)
V_{12} = 2253 pc/h
V_3 or V_{av34} 1640 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5804	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2523	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 20.6 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.321 (Exibit 25-19)
S_R= 61.0 mph (Exhibit 25-19)
S_0= 65.9 mph (Exhibit 25-19)
S = 63.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1000 ft
V_u = 248 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5167	0.92	Level	7	0	0.966	1.00	5813
Ramp	436	0.92	Level	0	0	1.000	1.00	474
UpStream	248	0.92	Level	0	0	1.000	1.00	270
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.391 using Equation (Exhibit 25-5)
V_{12} = 2274 pc/h
V_3 or V_{av34} 1769 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes,V_{12a} = 2325 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6287	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2799	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.5 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.334 (Exibit 25-19)
S_R= 60.6 mph (Exhibit 25-19)
S_0= 65.5 mph (Exhibit 25-19)
S = 63.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1370 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4471	0.92	Level	7	0	0.966	1.00	5030
Ramp	816	0.92	Level	0	0	1.000	1.00	887
UpStream								
DownStream	1370	0.92	Level	0	0	1.000	1.00	1489

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 2693 pc/h
V_3 or V_{av34} 1168 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5030	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	4143	Exhibit 25-14	9600	No
V_R	887	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2693	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 25.3 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.508 (Exhibit 25-19)
S_R = 55.8 mph (Exhibit 25-19)
S_0 = 76.1 mph (Exhibit 25-19)
S = 63.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 816 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3655	0.92	Level	7	0	0.966	1.00	4112
Ramp	1370	0.92	Level	0	0	1.000	1.00	1489
UpStream	816	0.92	Level	0	0	1.000	1.00	887
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.255 using Equation (Exhibit 25-5)

V_{12} = 1047 pc/h

V_3 or V_{av34} 1532 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1644 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5601	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3133	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 24.8 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.361 (Exibit 25-19)

S_R = 59.9 mph (Exhibit 25-19)

S_0 = 67.4 mph (Exhibit 25-19)

S = 63.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	pM Peak Hour	Analysis Year	Existing (2013)

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 123 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6002	0.92	Level	7	0	0.966	1.00	6752
Ramp	1251	0.92	Level	0	0	1.000	1.00	1360
UpStream								
DownStream	123	0.92	Level	0	0	1.000	1.00	134

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3711 pc/h
V_3 or V_{av34} 1520 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6752	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5392	Exhibit 25-14	9600	No
V_R	1360	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3711	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 33.8 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.550 (Exhibit 25-19)
S_R= 54.6 mph (Exhibit 25-19)
S_0= 74.8 mph (Exhibit 25-19)
S = 62.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 297 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4751	0.92	Level	7	0	0.966	1.00	5345
Ramp	123	0.92	Level	0	0	1.000	1.00	134
UpStream								
DownStream	297	0.92	Level	0	0	1.000	1.00	323

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.424 using Equation (Exhibit 25-5)
V_{12} = 2267 pc/h
V_3 or V_{av34} 1539 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5479	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2401	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 19.8 (pc/mi/ln)
LOS = B (Exhibit 25-4)

Speed Determination

M_S = 0.315 (Exibit 25-19)
S_R= 61.2 mph (Exhibit 25-19)
S_0= 66.3 mph (Exhibit 25-19)
S = 63.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1000 ft
V_u = 123 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4874	0.92	Level	7	0	0.966	1.00	5483
Ramp	297	0.92	Level	0	0	1.000	1.00	323
UpStream	123	0.92	Level	0	0	1.000	1.00	134
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.410 using Equation (Exhibit 25-5)
V_{12} = 2248 pc/h
V_3 or V_{av34} 1617 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5806	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2571	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 20.8 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.321 (Exibit 25-19)
S_R= 61.0 mph (Exhibit 25-19)
S_0= 66.0 mph (Exhibit 25-19)
S = 63.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1553 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4667	0.92	Level	7	0	0.966	1.00	5250
Ramp	501	0.92	Level	0	0	1.000	1.00	545
UpStream								
DownStream	1553	0.92	Level	0	0	1.000	1.00	1688

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 2596 pc/h
V_3 or V_{av34} 1327 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5250	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	4705	Exhibit 25-14	9600	No
V_R	545	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2596	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 24.5 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.477 (Exhibit 25-19)
S_R= 56.6 mph (Exhibit 25-19)
S_0= 75.5 mph (Exhibit 25-19)
S = 64.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 501 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4166	0.92	Level	7	0	0.966	1.00	4687
Ramp	1553	0.92	Level	0	0	1.000	1.00	1688
UpStream	501	0.92	Level	0	0	1.000	1.00	545
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.230 using Equation (Exhibit 25-5)

V_{12} = 1077 pc/h

V_3 or V_{av34} 1805 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1874 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6375	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3562	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 28.1 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.409 (Exibit 25-19)

S_R = 58.5 mph (Exhibit 25-19)

S_0 = 66.7 mph (Exhibit 25-19)

S = 61.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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I-210 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)
Project Description	Irwindale MRF & Transfer Station TIA (JN 08517)		

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6961	0.92	Level	7	0	0.966	1.00	7831
Ramp	599	0.92	Level	0	0	1.000	1.00	651
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 3781 pc/h

V_3 or V_{av34} 2025 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7831	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7180	Exhibit 25-14	9600	No
V_R	651	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3781	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

D_R = 33.2 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.487 (Exhibit 25-19)

S_R = 56.4 mph (Exhibit 25-19)

S_0 = 72.8 mph (Exhibit 25-19)

S = 63.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6362	0.92	Level	7	0	0.966	1.00	7157
Ramp	540	0.92	Level	0	0	1.000	1.00	587
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.304 using Equation (Exhibit 25-5)

V_{12} = 2174 pc/h

V_3 or V_{av34} 2491 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2862 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7744	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3449	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.0 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.409 (Exibit 25-19)

S_R = 58.6 mph (Exhibit 25-19)

S_0 = 64.1 mph (Exhibit 25-19)

S = 61.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6902	0.92	Level	7	0	0.966	1.00	7765
Ramp	461	0.92	Level	0	0	1.000	1.00	501
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)

L_{EQ} =
P_{FM} = 0.378 using Equation (Exhibit 25-5)
V_{12} = 2937 pc/h
V_3 or V_{av34} = 2414 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3106 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8266	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3607	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.0 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.416 (Exibit 25-19)
S_R = 58.4 mph (Exhibit 25-19)
S_0 = 63.3 mph (Exhibit 25-19)
S = 61.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)

L_{EQ} =
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)
Project Description	Irwindale MRF & Transfer Station TIA (JN 08517)		

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7500	0.92	Level	7	0	0.966	1.00	8437
Ramp	1539	0.92	Level	0	0	1.000	1.00	1673
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 3432 pc/h

V_3 or V_{av34} 2502 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8437	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6764	Exhibit 25-14	9600	No
V_R	1673	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3432	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 22.1 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.579 (Exhibit 25-19)

S_R = 53.8 mph (Exhibit 25-19)

S_0 = 70.9 mph (Exhibit 25-19)

S = 62.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5961	0.92	Level	7	0	0.966	1.00	6706
Ramp	485	0.92	Level	0	0	1.000	1.00	527
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.439 using Equation (Exhibit 25-5)

V_{12} = 2942 pc/h

V_3 or V_{av34} 1882 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7233	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3469	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.6 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.383 (Exibit 25-19)

S_R = 59.3 mph (Exhibit 25-19)

S_0 = 65.0 mph (Exhibit 25-19)

S = 62.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)
Project Description	Irwindale MRF & Transfer Station TIA (JN 08517)		

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D,V_R,V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7043	0.92	Level	7	0	0.966	1.00	7923
Ramp	523	0.92	Level	0	0	1.000	1.00	568
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 3775 pc/h

V_3 or V_{av34} 2074 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7923	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7355	Exhibit 25-14	9600	No
V_R	568	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3775	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 33.1 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.479 (Exhibit 25-19)

S_R= 56.6 mph (Exhibit 25-19)

S_0= 72.6 mph (Exhibit 25-19)

S = 64.0 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6520	0.92	Level	7	0	0.966	1.00	7335
Ramp	448	0.92	Level	0	0	1.000	1.00	487
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)

L_{EQ} =

P_{FM} = 0.316 using Equation (Exhibit 25-5)

V_{12} = 2319 pc/h

V_3 or V_{av34} 2508 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2934 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7822	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3421	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.8 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.405 (Exibit 25-19)

S_R = 58.7 mph (Exhibit 25-19)

S_0 = 63.9 mph (Exhibit 25-19)

S = 61.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)

L_{EQ} =

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6968	0.92	Level	7	0	0.966	1.00	7839
Ramp	283	0.92	Level	0	0	1.000	1.00	308
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.402 using Equation (Exhibit 25-5)
V_{12} = 3154 pc/h
V_3 or V_{av34} 2342 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8147	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3462	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = 27.9 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.396 (Exibit 25-19)
S_R = 58.9 mph (Exhibit 25-19)
S_0 = 63.2 mph (Exhibit 25-19)
S = 61.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)
Project Description	Irwindale MRF & Transfer Station TIA (JN 08517)		

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7158	0.92	Level	7	0	0.966	1.00	8053
Ramp	822	0.92	Level	0	0	1.000	1.00	893
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 2755 pc/h

V_3 or V_{av34} 2649 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3221 pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8053	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7160	Exhibit 25-14	9600	No
V_R	893	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2755	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

D_R = 20.3 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.508 (Exhibit 25-19)

S_R = 55.8 mph (Exhibit 25-19)

S_0 = 71.3 mph (Exhibit 25-19)

S = 64.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6336	0.92	Level	7	0	0.966	1.00	7128
Ramp	899	0.92	Level	0	0	1.000	1.00	977
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.382 using Equation (Exhibit 25-5)

V_{12} = 2726 pc/h

V_3 or V_{av34} 2201 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2851 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8105	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3828	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.2 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.437 (Exibit 25-19)

S_R= 57.8 mph (Exhibit 25-19)

S_0= 64.1 mph (Exhibit 25-19)

S = 60.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

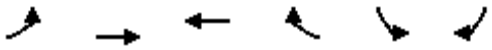
S = mph (Exhibit 25-15)

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Queuing Analysis Worksheets

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3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Volume (vph)	0	435	1279	0	541	432
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Satd. Flow (RTOR)						444
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	500	1470	0	622	497
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	500	1470	0	622	497
v/c Ratio		0.19	0.80		1.04	0.31
Control Delay		8.3	16.5		71.5	0.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.3	16.5		71.5	0.5
Queue Length 50th (ft)		32	213		~251	0
Queue Length 95th (ft)		46	277		#404	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2636	1835		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.19	0.80		1.04	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



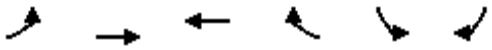
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	283	567	917	1311	0	0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Satd. Flow (RTOR)		457				
Peak Hour Factor	0.94	0.94	0.94	0.94	1.00	1.00
Adj. Flow (vph)	301	603	976	1395	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	301	603	976	1395	0	0
v/c Ratio	0.29	0.37	1.03	0.39		
Control Delay	17.1	0.7	54.0	0.3		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	17.1	0.7	54.0	0.3		
Queue Length 50th (ft)	43	0	~400	0		
Queue Length 95th (ft)	71	0	#611	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	943	3570		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.28	0.37	1.03	0.39		

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	17
Average Queue (ft)	459	352	7
95th Queue (ft)	459	427	20
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	94	64	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	814	332	0	413	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						261
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	925	377	0	469	261
v/c Ratio		0.34	0.20		0.85	0.16
Control Delay		8.7	8.1		35.3	0.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.7	8.1		35.3	0.2
Queue Length 50th (ft)		67	36		150	0
Queue Length 95th (ft)		89	55		#278	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2761	1922		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.34	0.20		0.78	0.16

Intersection Summary	
Area Type:	Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	907	946	727	878	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		499				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	955	996	765	924	0	0
v/c Ratio	0.88	0.62	0.82	0.26		
Control Delay	31.9	1.8	21.6	0.2		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	31.9	1.8	21.6	0.2		
Queue Length 50th (ft)	171	0	214	0		
Queue Length 95th (ft)	#275	0	#423	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.88	0.62	0.82	0.26		

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	17
Average Queue (ft)	459	337	3
95th Queue (ft)	459	413	15
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	79	44	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

APPENDIX G

Traffic Signal Warrant Analysis Worksheets

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

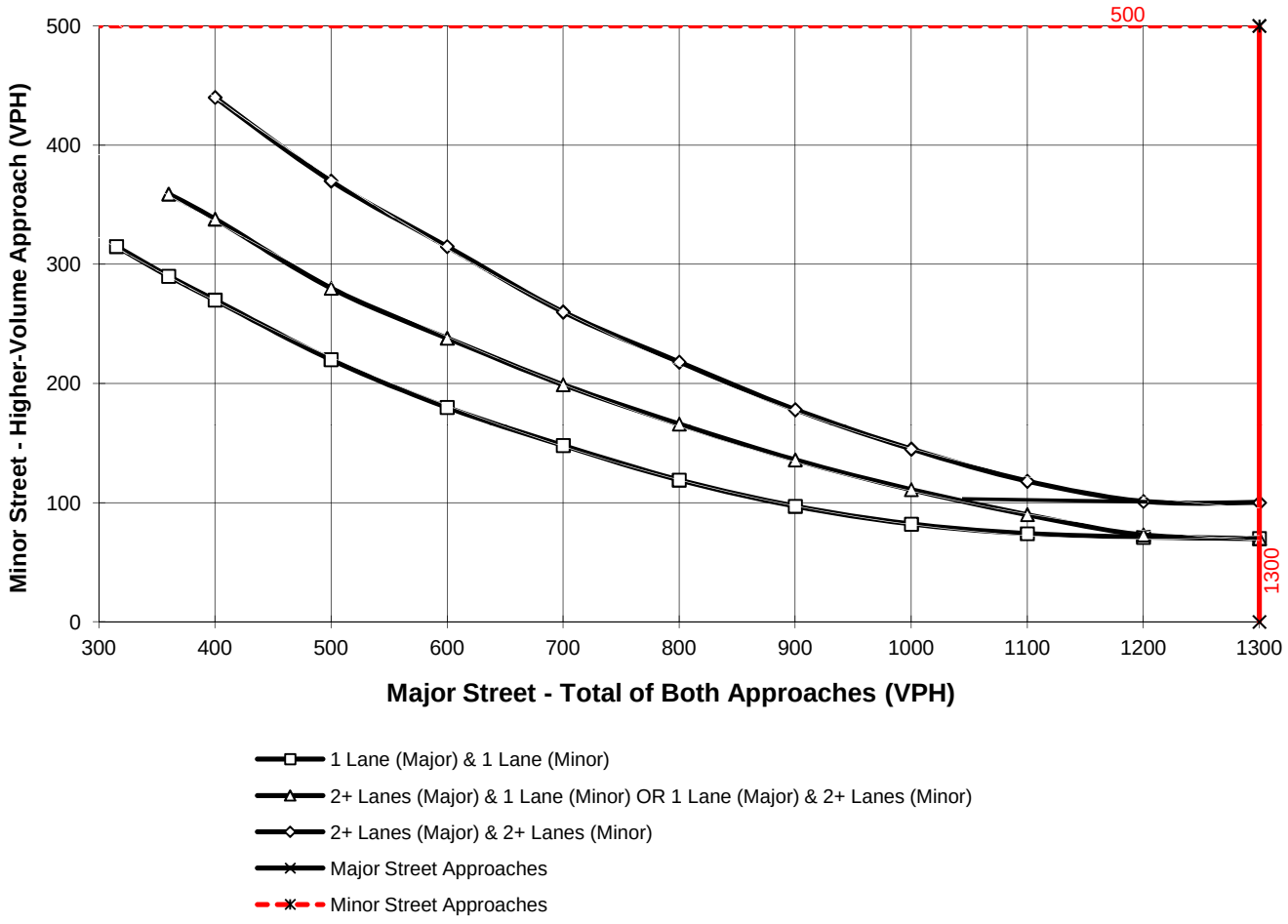
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2013) - Weekday AM Peak Hour**

Major Street Name = **Live Oak Avenue** Total of Both Approaches (VPH) = **1800**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **I-605 NB Off-Ramps** High Volume Approach (VPH) = **623**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

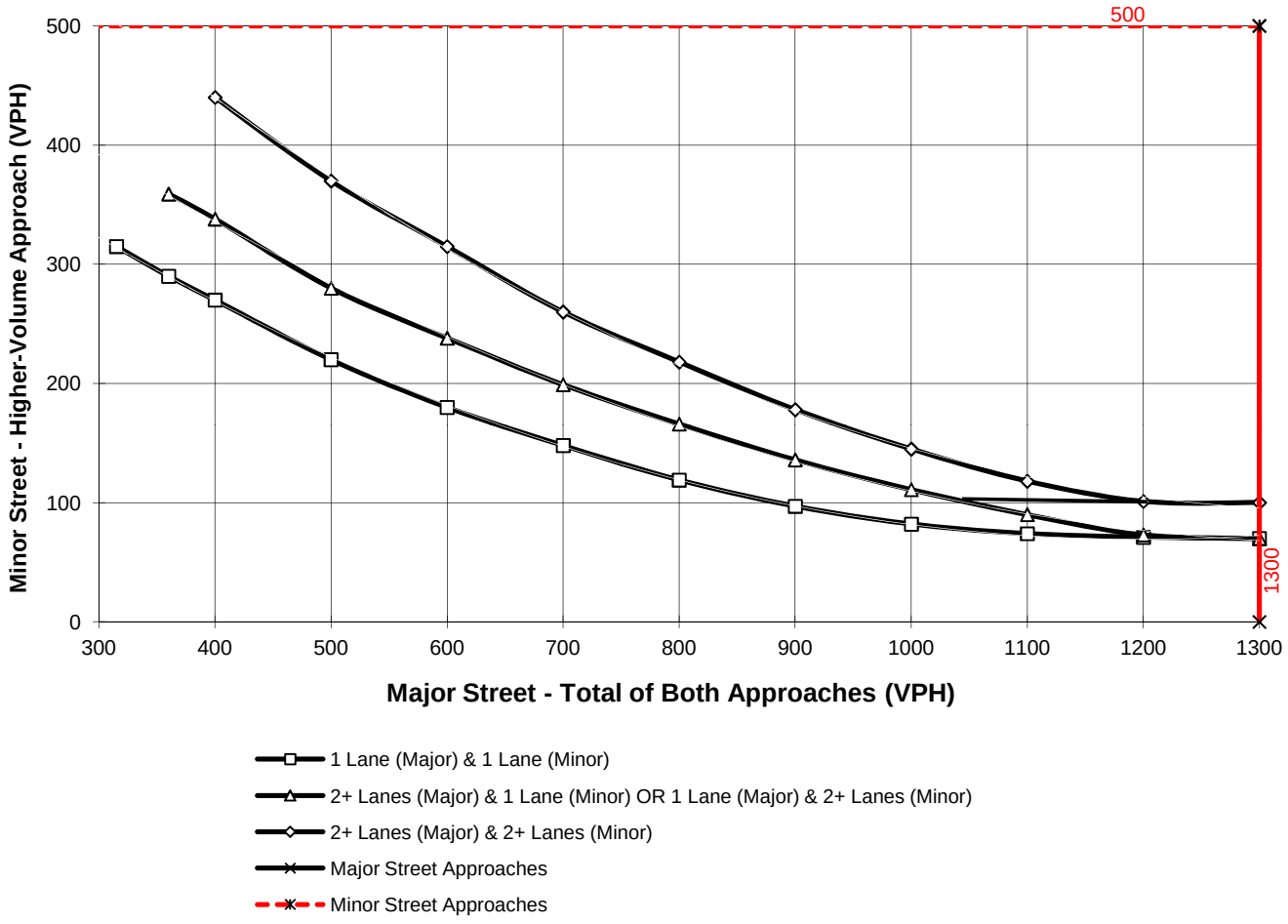
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2013) - Weekday PM Peak Hour**

Major Street Name = **Live Oak Avenue** Total of Both Approaches (VPH) = **1826**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **I-605 NB Off-Ramps** High Volume Approach (VPH) = **691**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

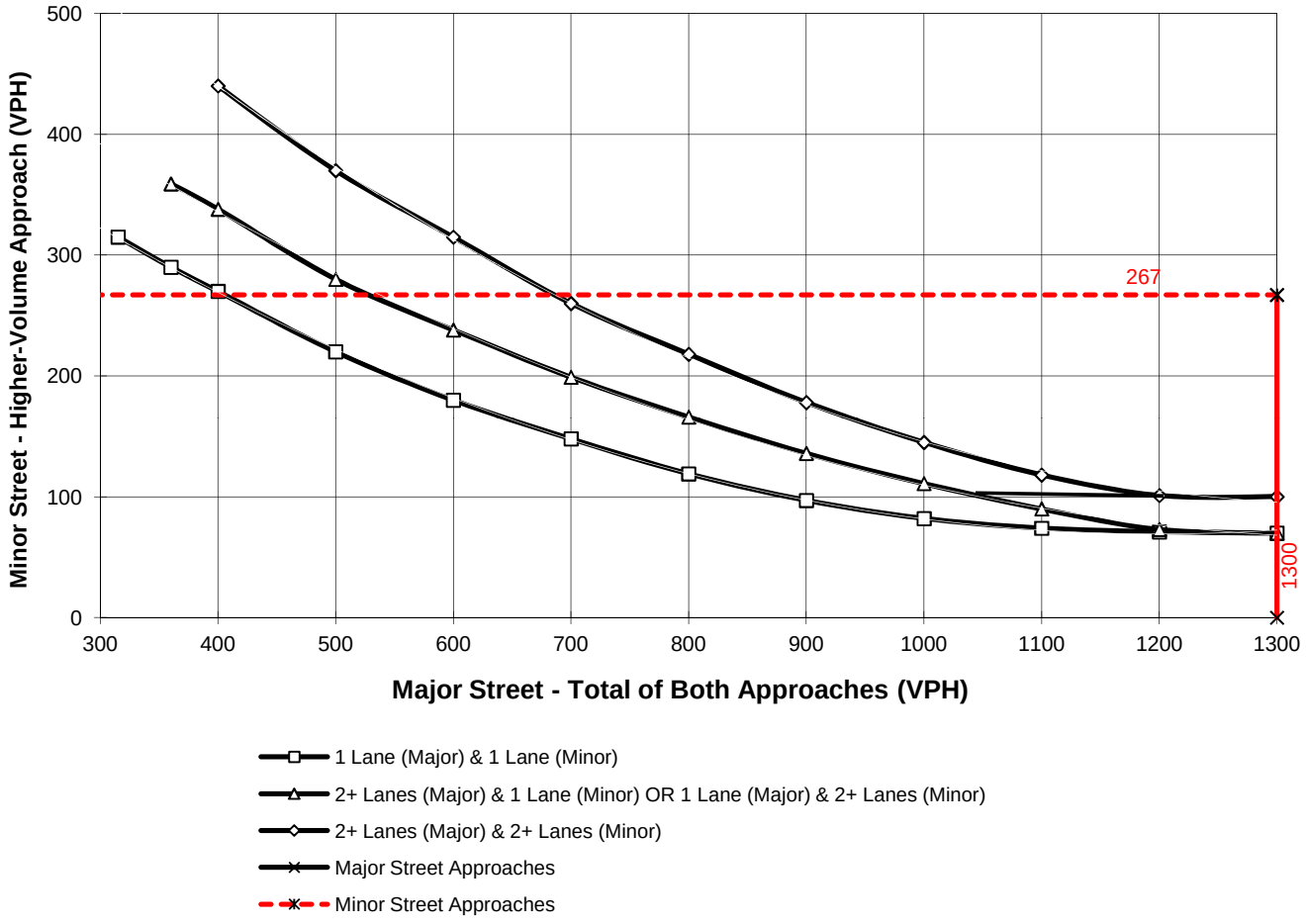
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2013) + Project Conditions - Weekday AM Peak Hour**

Major Street Name = **Arrow Highway**
Total of Both Approaches (VPH) = **2115**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Driveway 1**
High Volume Approach (VPH) = **267**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

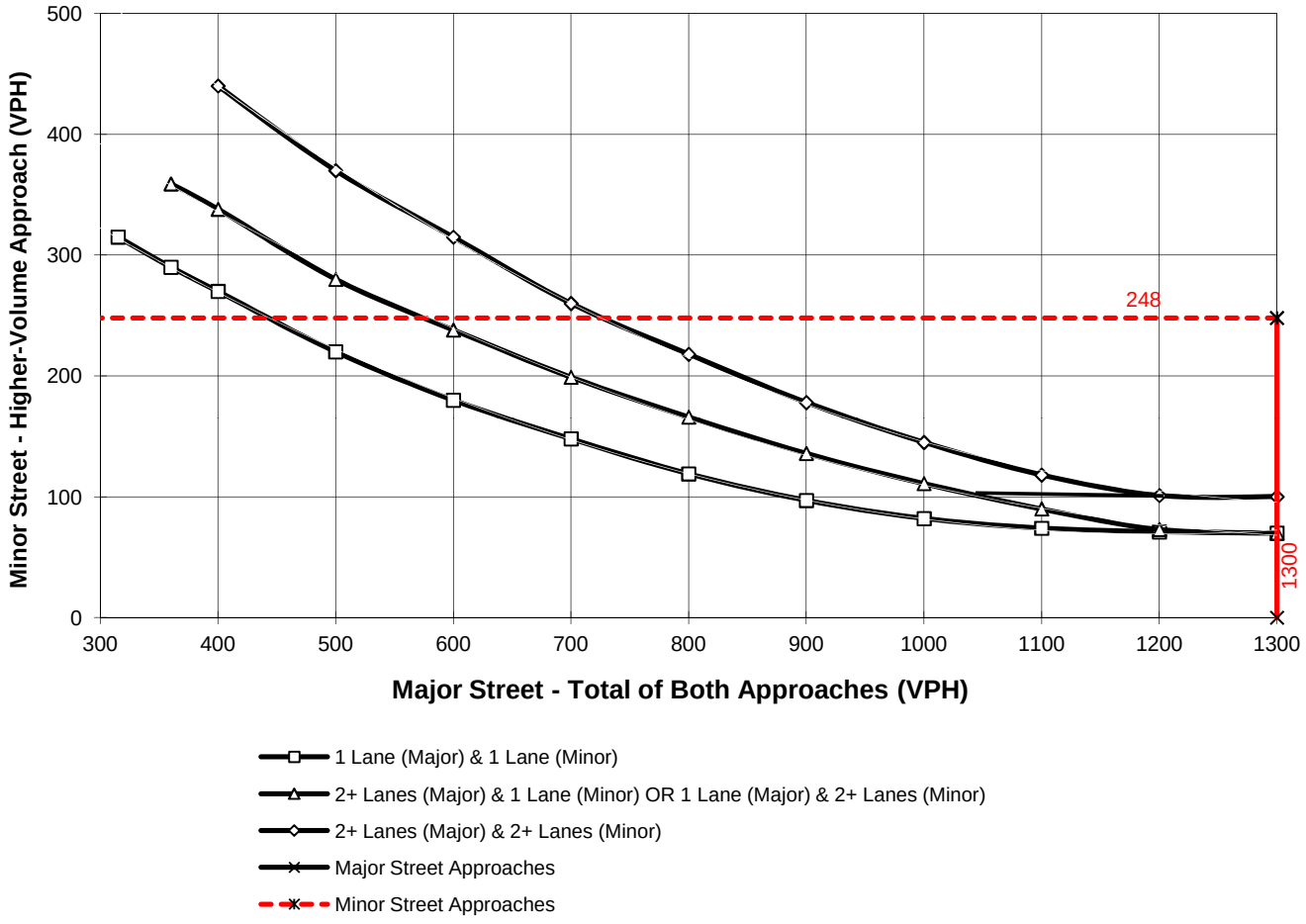
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2013) + Project Conditions - Weekday PM Peak Hour**

Major Street Name = **Arrow Highway**
Total of Both Approaches (VPH) = **1543**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Driveway 1**
High Volume Approach (VPH) = **248**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



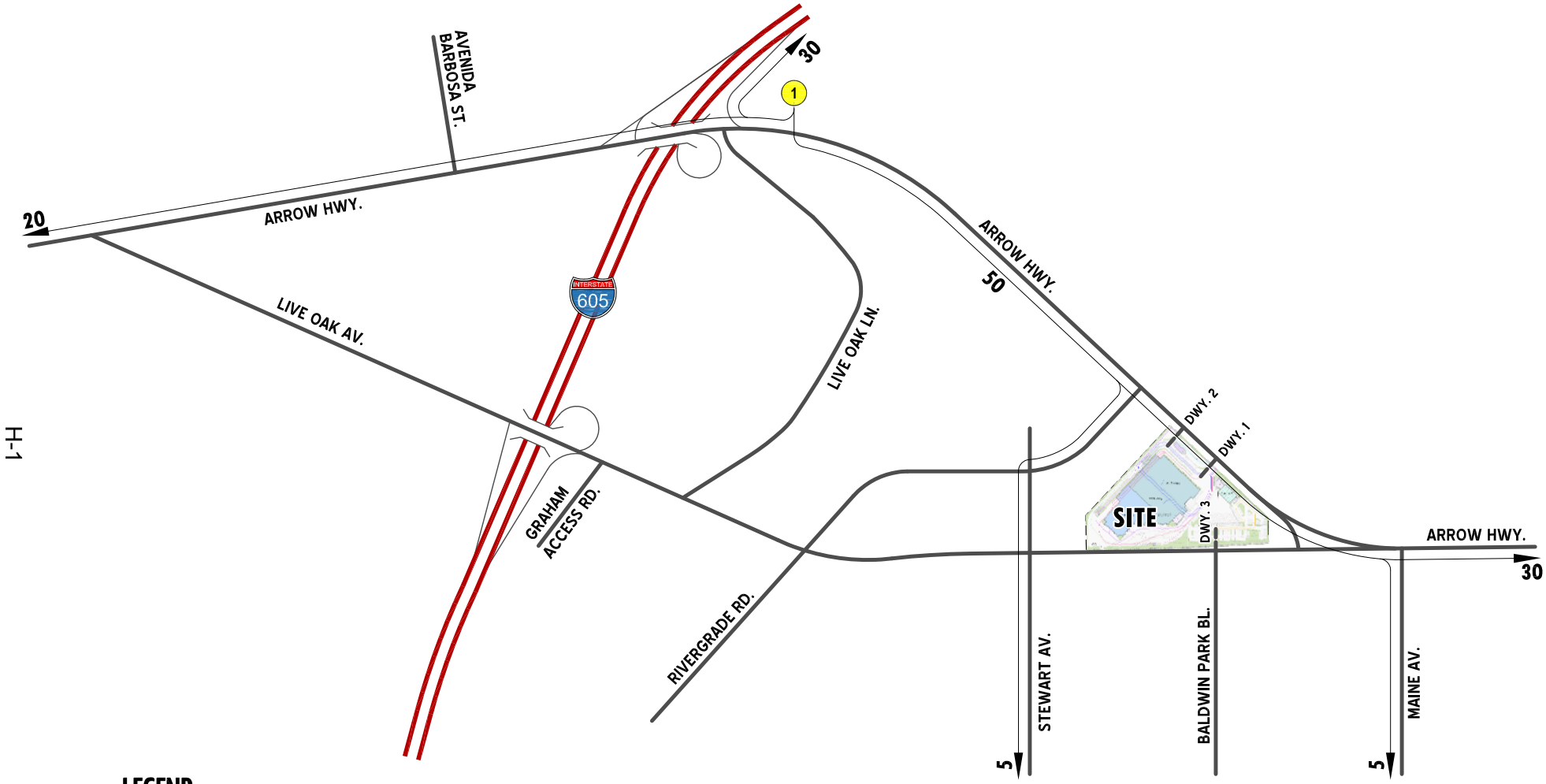
*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX H

Cumulative Project Trip Distributions

EXHIBIT E-1

TAZ 1 TRIP DISTRIBUTION
(KARE YOUTH LEAGUE/SANTA FE DAM SPORTS PARK)



LEGEND:

10 = PERCENT TO/FROM PROJECT

(1) = TAZ 1 (KARE YOUTH LEAGUE/SANTA FE DAM SPORTS PARK)

N

EXHIBIT E-2 (Page 1 of 2)

TAZ 2 OUTBOUND TRIP DISTRIBUTION (AHERN RENTALS)

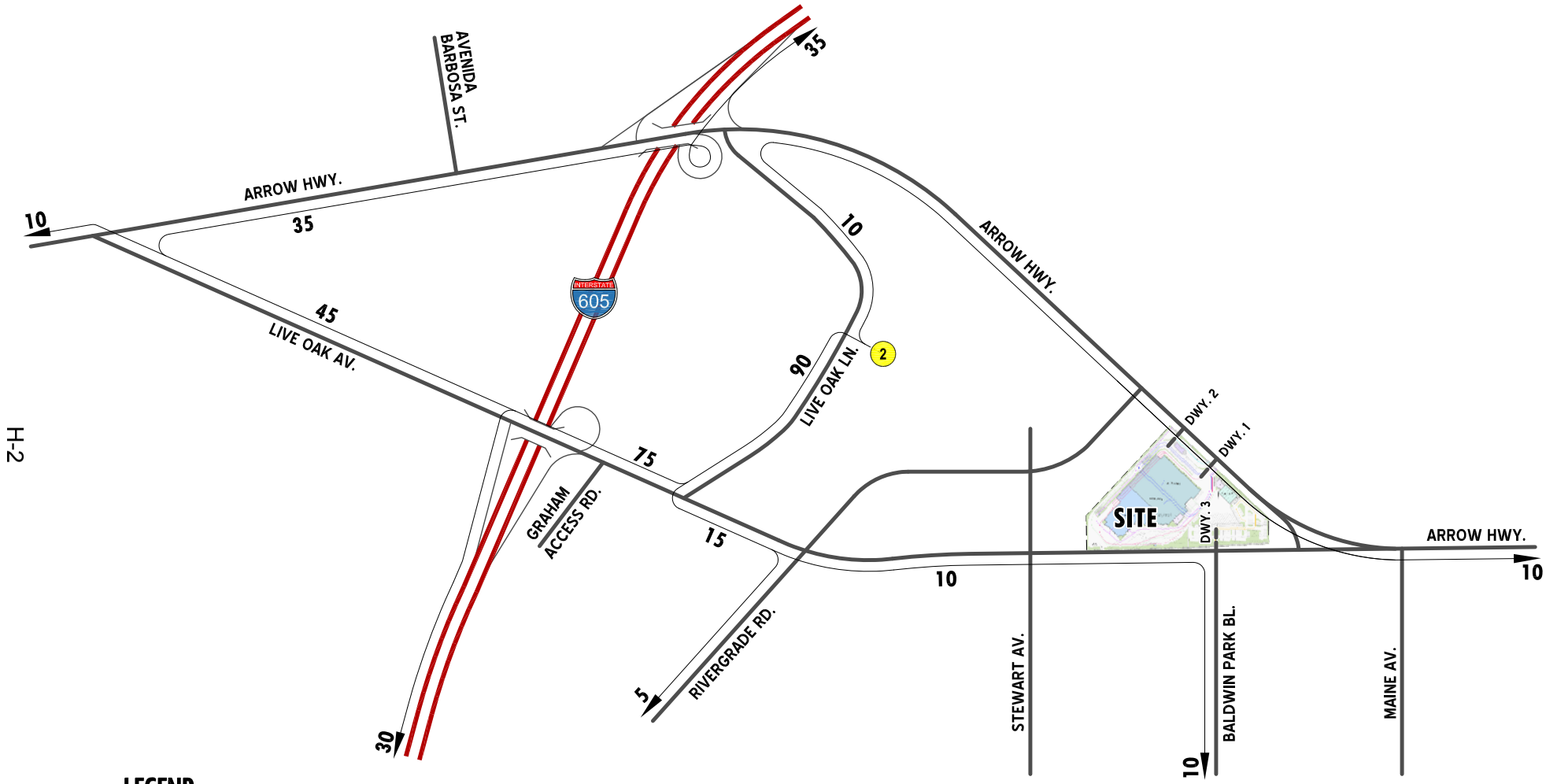
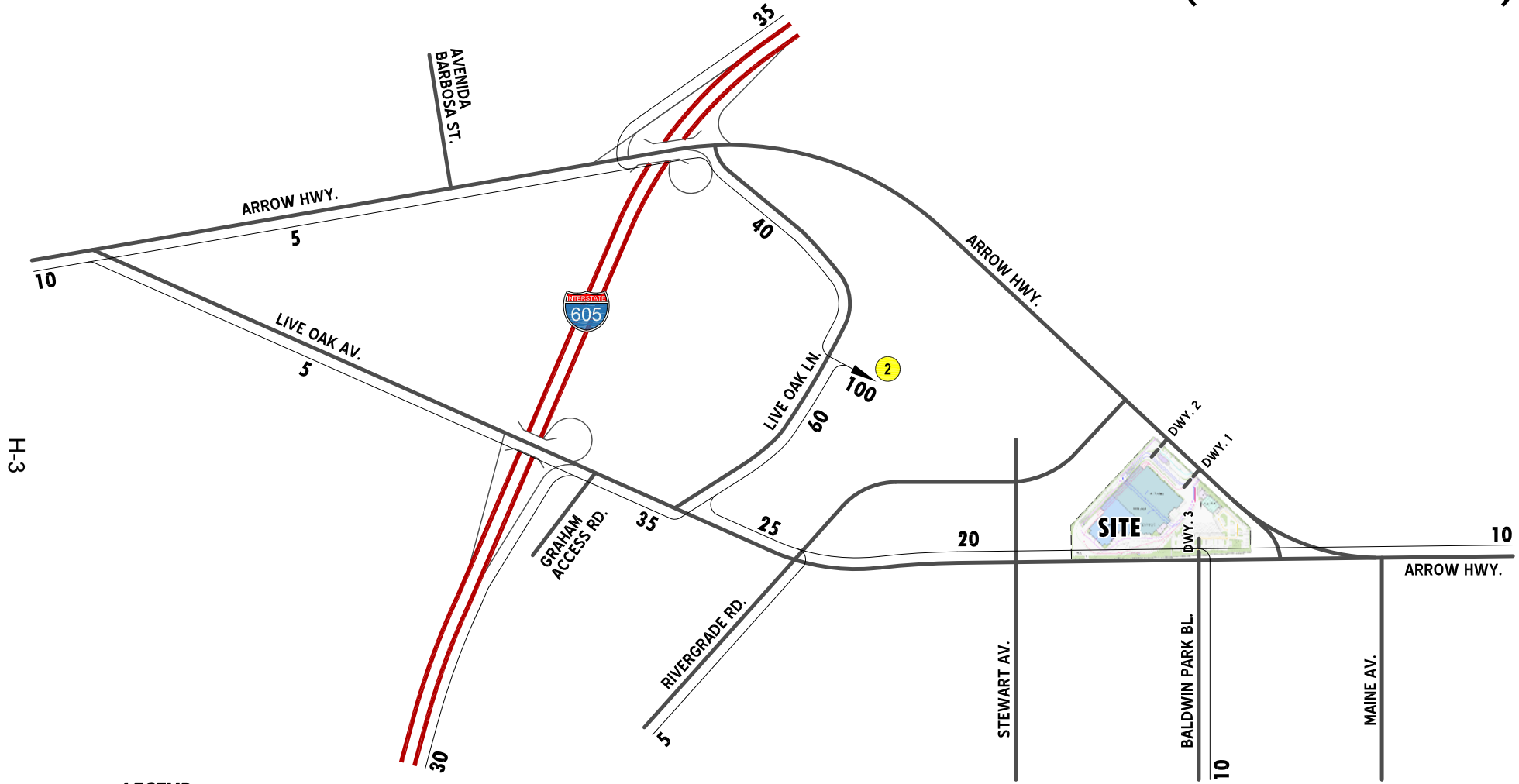


EXHIBIT E-2 (Page 2 of 2)

TAZ 2 INBOUND TRIP DISTRIBUTION (AHERN RENTALS)



LEGEND:

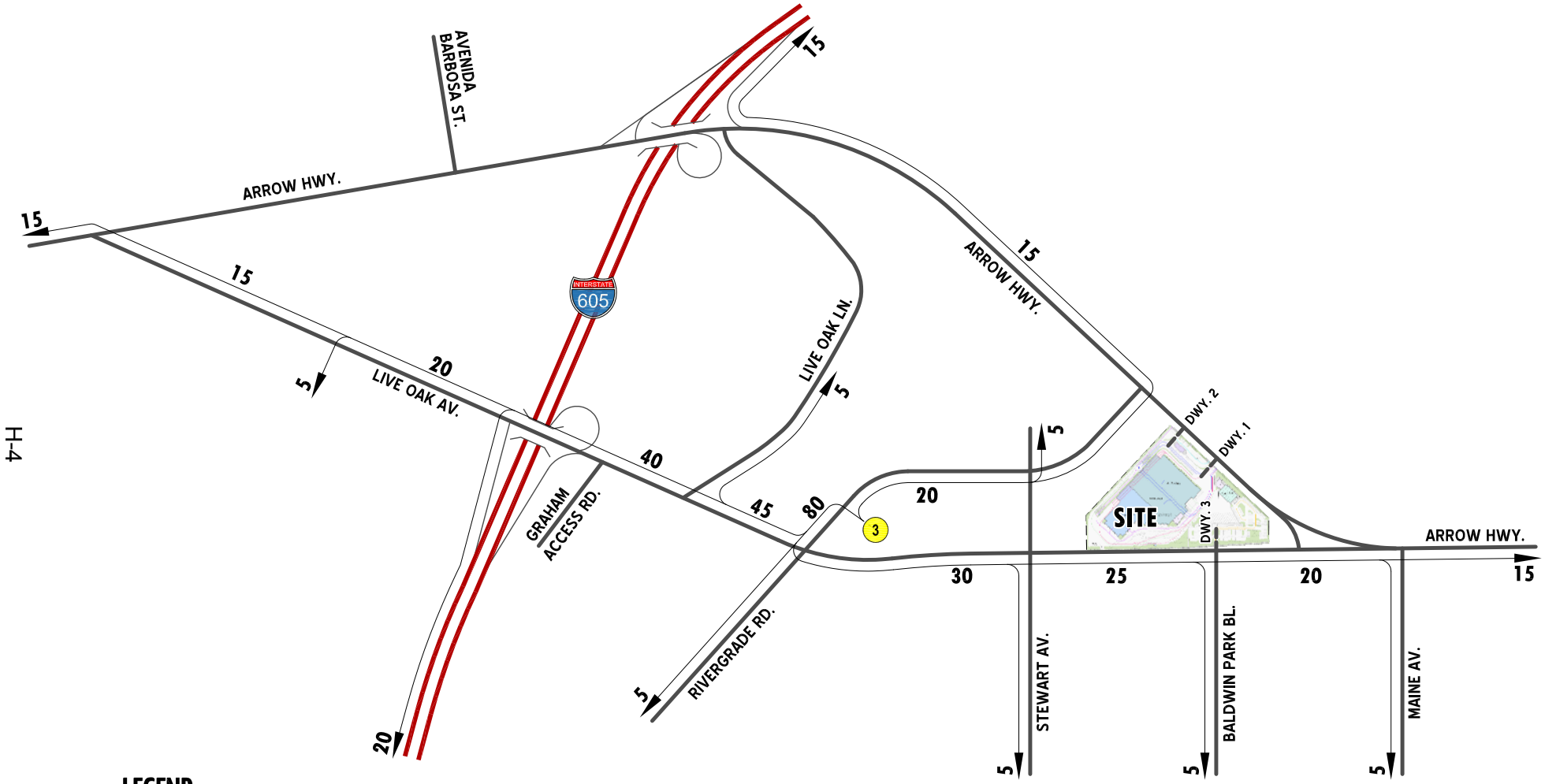
10 = PERCENT TO PROJECT

(2) = TAZ 2 (AHERN RENTALS)

N

EXHIBIT E-3

TAZ 3 TRIP DISTRIBUTION
(5200 RIVERGRADE ROAD - COMMERCIAL)



LEGEND:

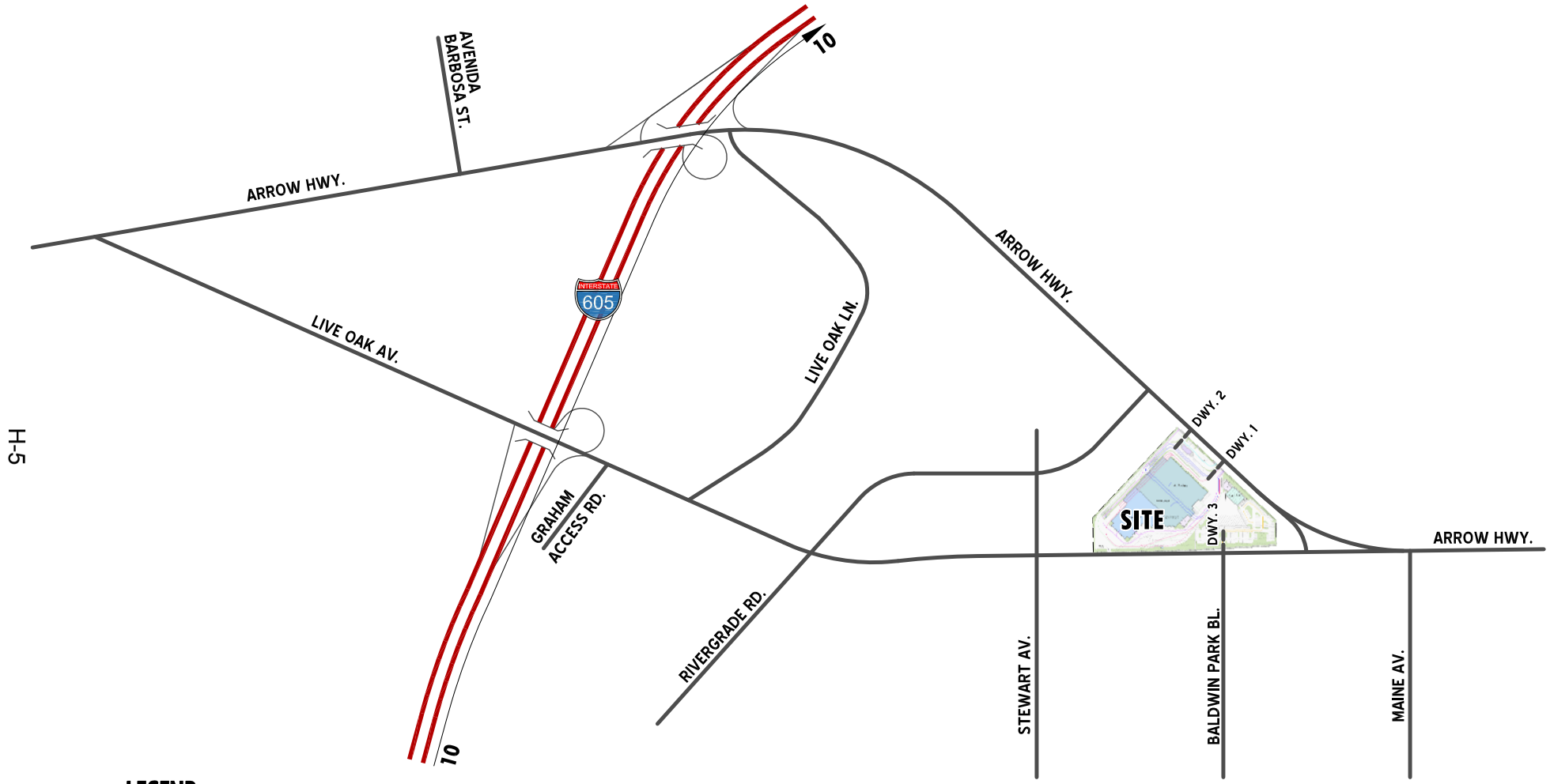
10 = PERCENT TO/FROM PROJECT

3 = TAZ 3 (5200 RIVERGRADE ROAD - COMMERCIAL)

N

EXHIBIT E-4

TAZ 4 TRIP DISTRIBUTION (MIXED USE)



LEGEND:

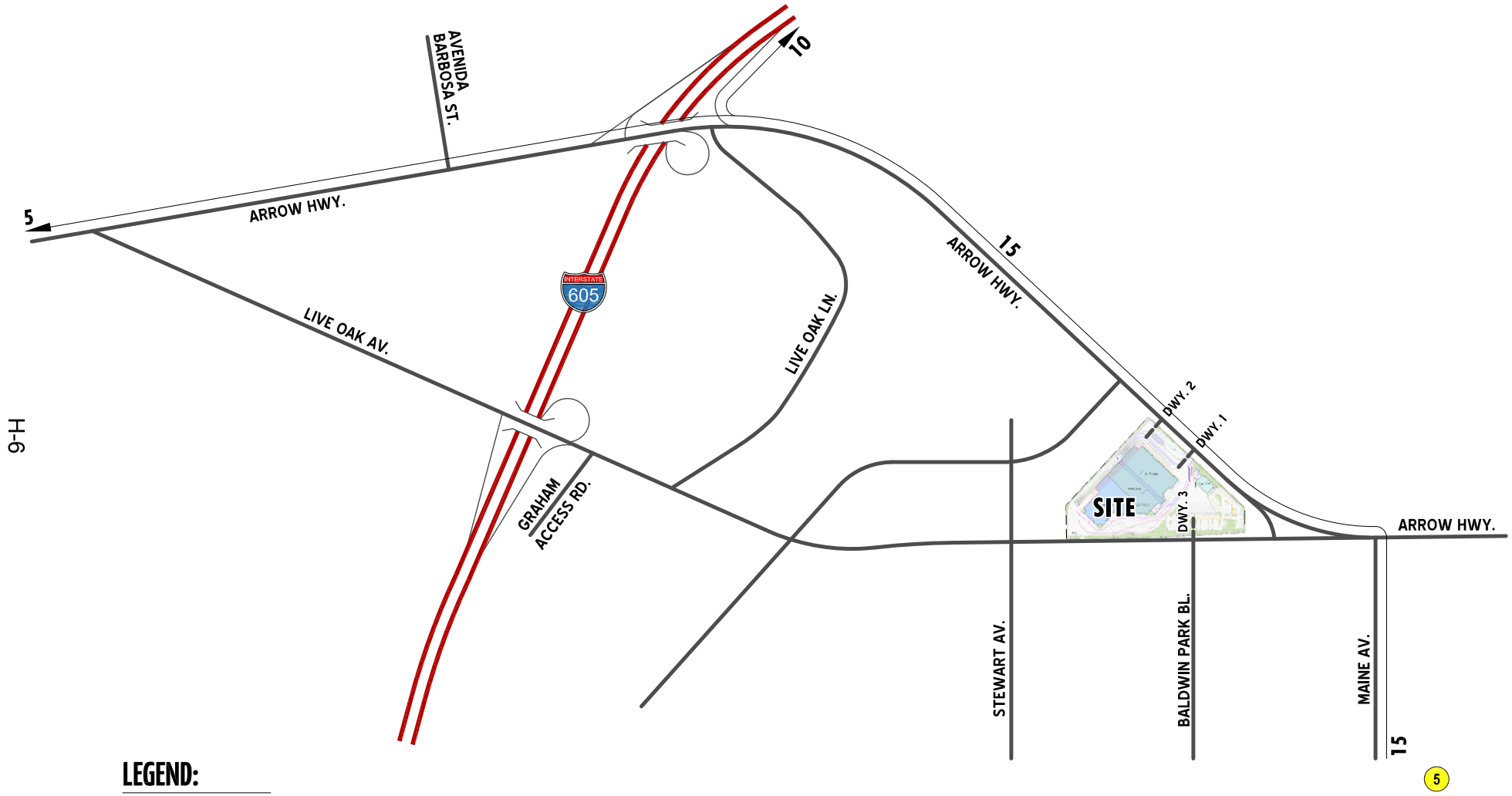
10 = PERCENT TO/FROM PROJECT

4 = TAZ 4 (MIXED USE)

N

EXHIBIT E-5

TAZ 5 TRIP DISTRIBUTION (MIXED USE)



LEGEND:

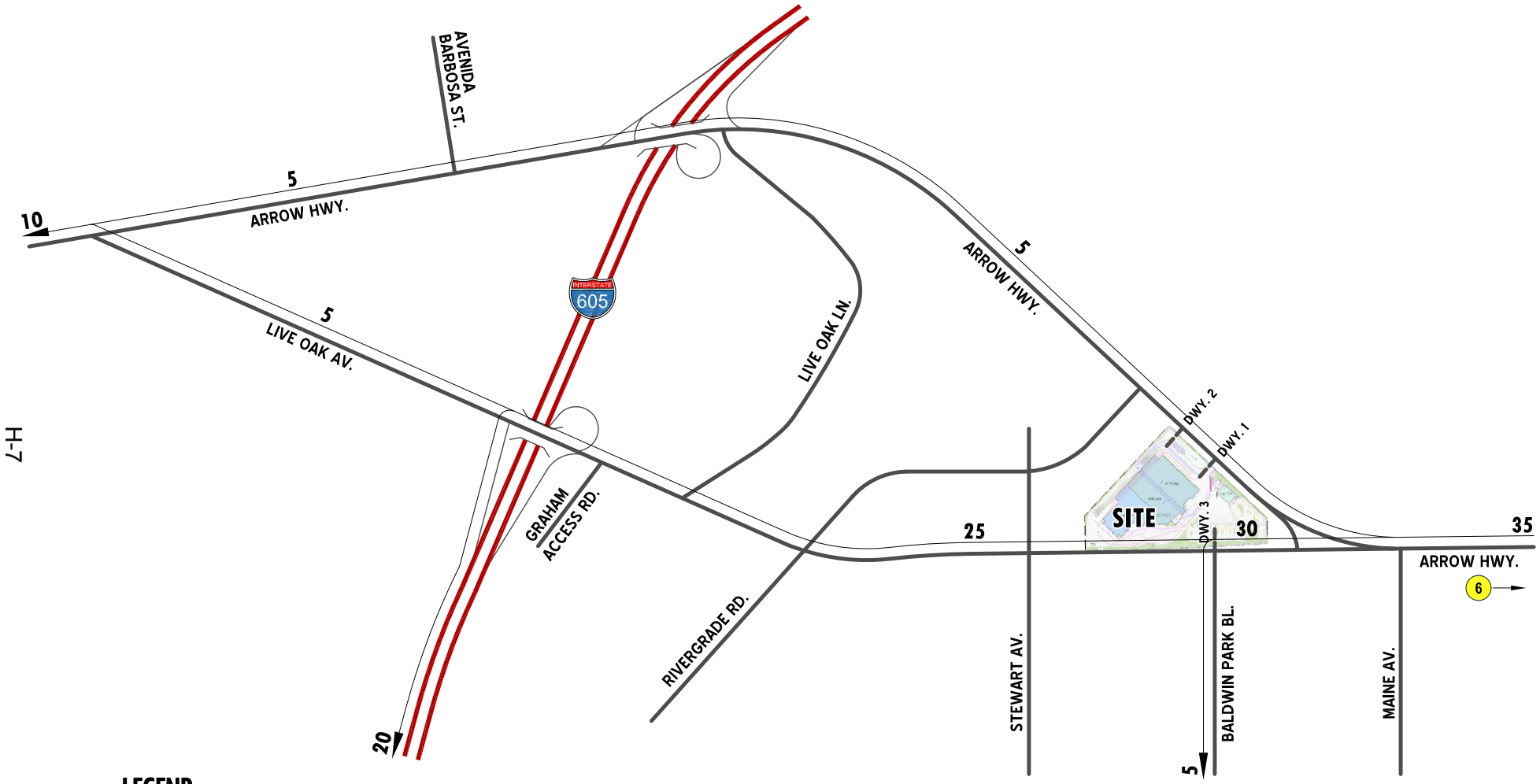
10 = PERCENT TO/FROM PROJECT

(5) = TAZ 5 (MIXED USE)

N

EXHIBIT E-6

TAZ 6 TRIP DISTRIBUTION (MIXED USE)



LEGEND:

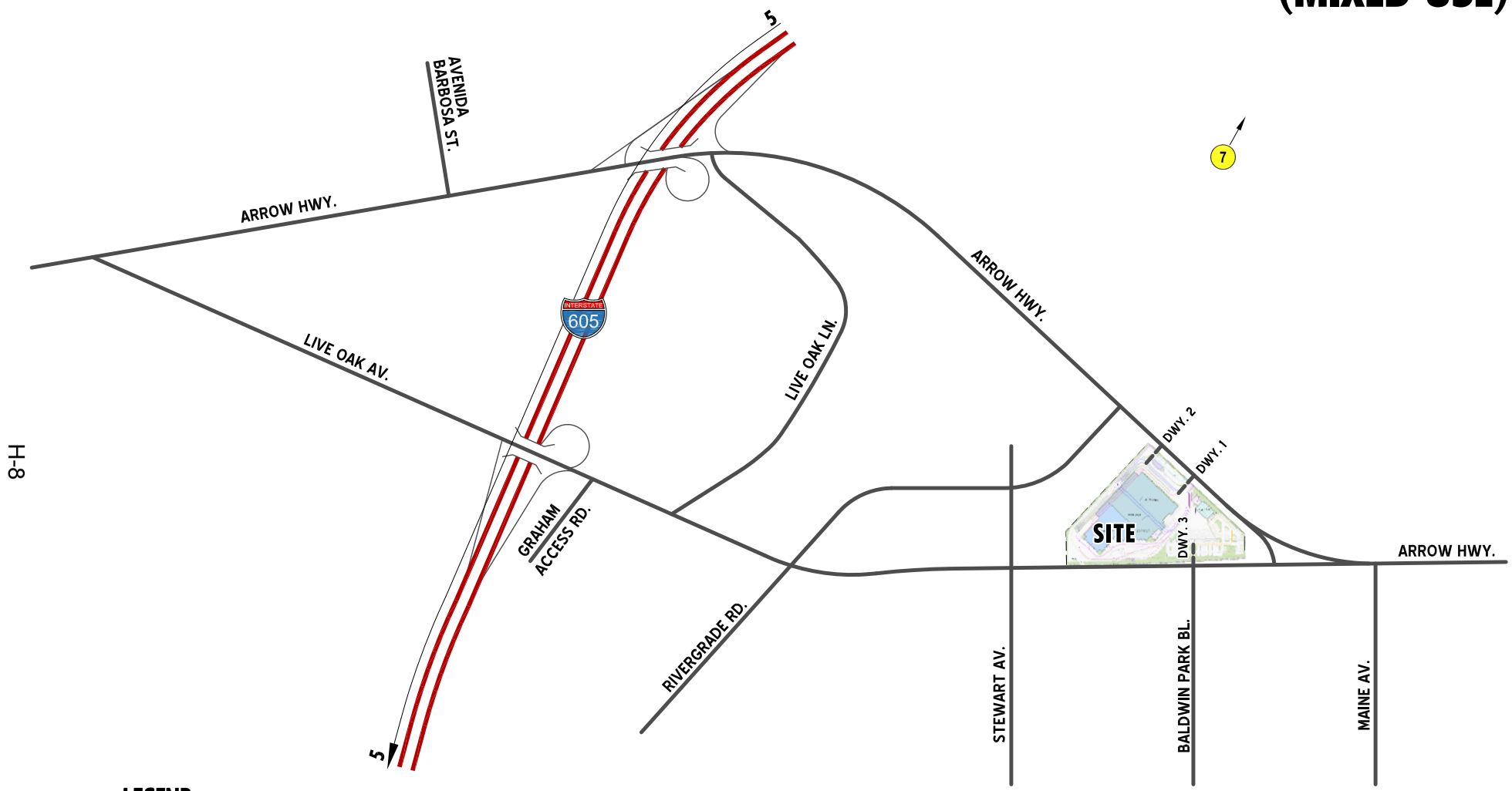
10 = PERCENT TO/FROM PROJECT

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EXHIBIT E-7

TAZ 7 TRIP DISTRIBUTION (MIXED USE)



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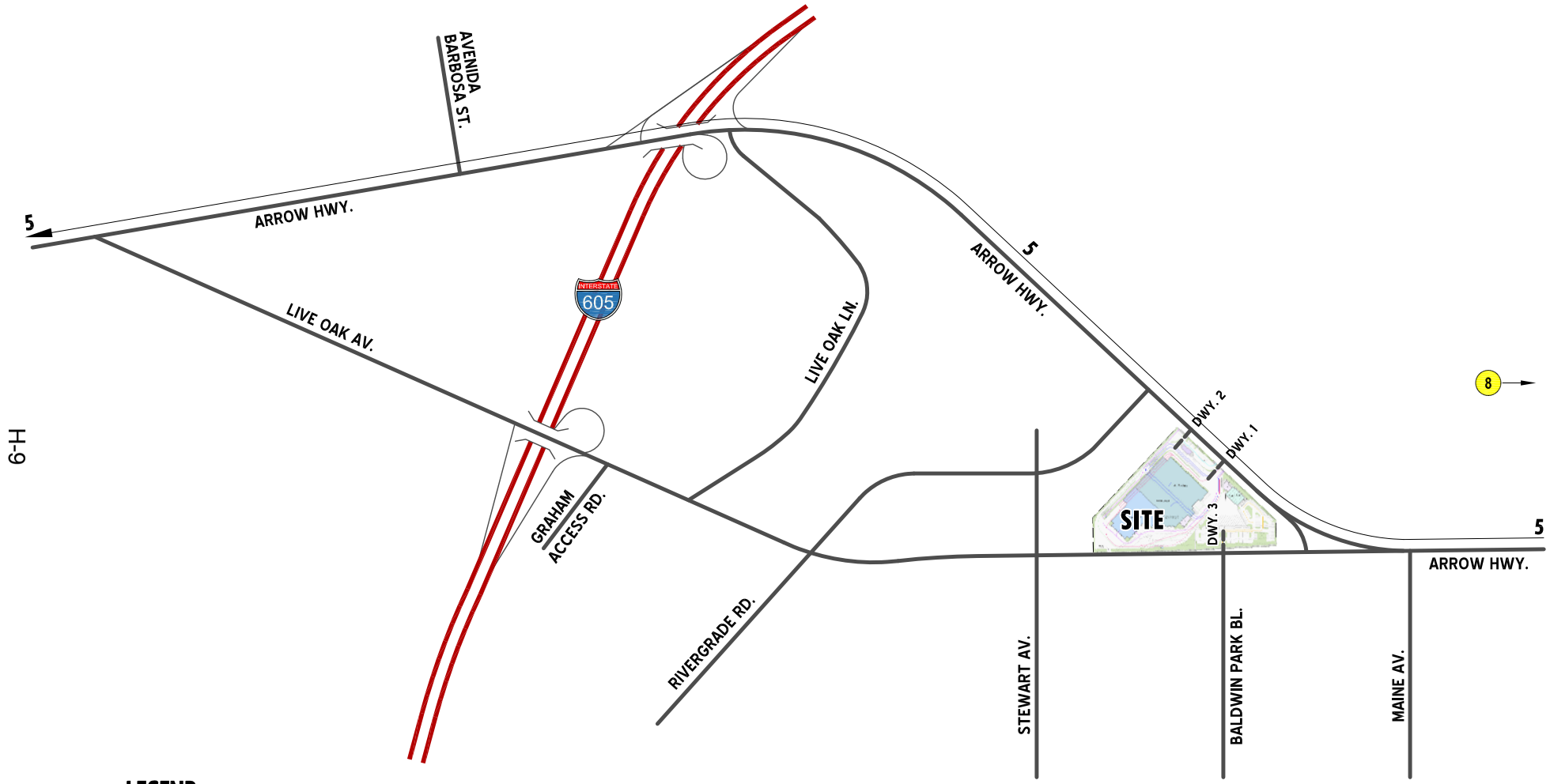
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EXHIBIT E-8

TAZ 8 TRIP DISTRIBUTION (MIXED USE)



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8 = TAZ 8 (MIXED USE)

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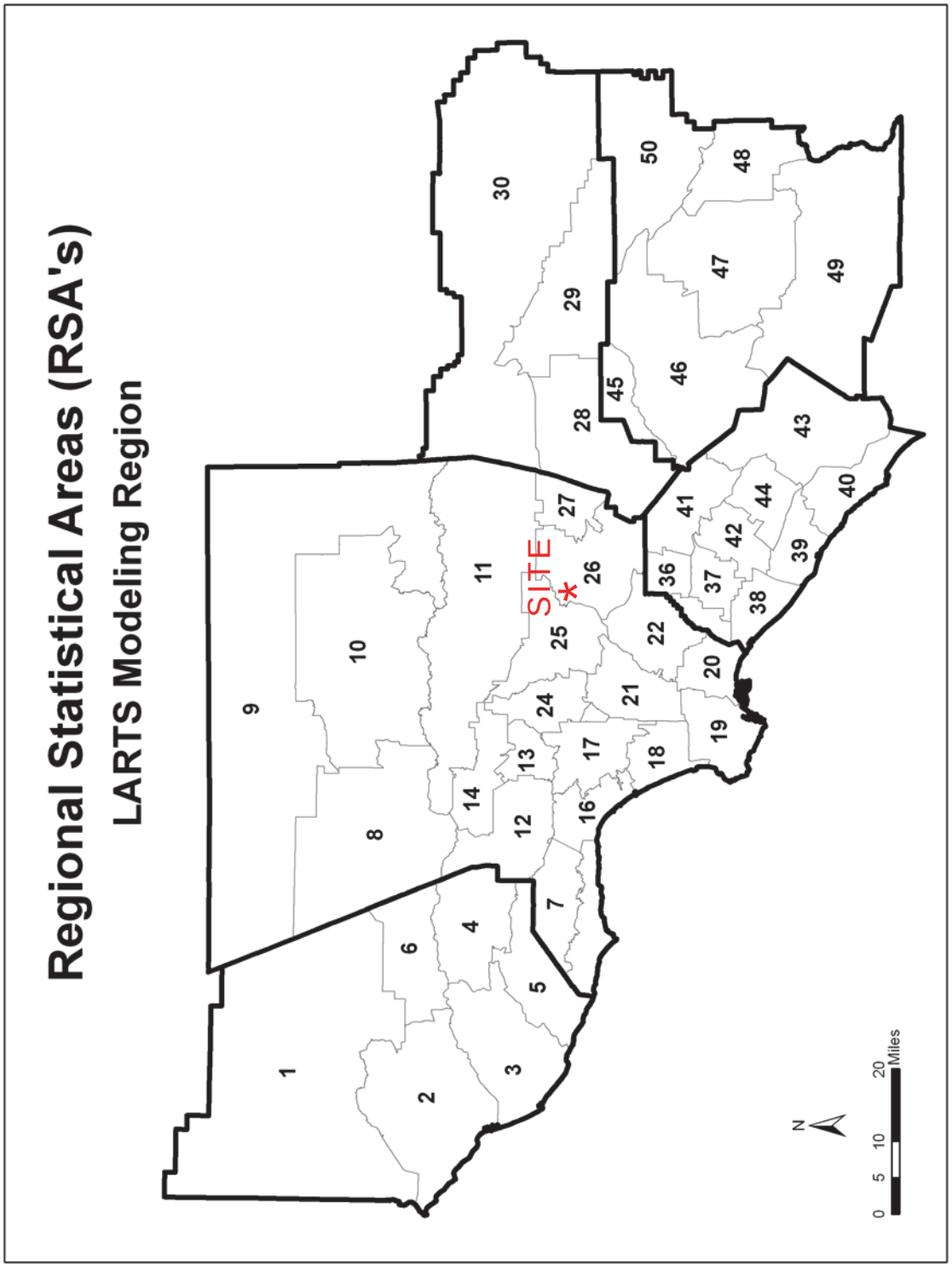
APPENDIX I

Los Angeles CMP Growth Factor Excerpts

Exhibit D-1

GENERAL TRAFFIC VOLUME GROWTH FACTORS

RSA	Representative City/Place	2010	2015	2020	2025	2030	2035
7	Agoura Hills	1.000	1.020	1.041	1.052	1.063	1.075
8	Santa Clarita	1.000	1.145	1.291	1.348	1.405	1.461
9	Lancaster	1.000	1.214	1.427	1.676	1.924	2.172
10	Palmdale	1.000	1.134	1.267	1.363	1.458	1.553
11	Angeles Forest	1.000	1.151	1.301	1.394	1.487	1.580
12	West S.F. Valley	1.000	1.027	1.054	1.068	1.083	1.097
13	Burbank	1.000	1.024	1.049	1.063	1.077	1.092
14	Sylmar	1.000	1.024	1.049	1.071	1.093	1.114
15	Malibu	1.000	1.027	1.054	1.075	1.096	1.117
16	Santa Monica	1.000	1.014	1.028	1.038	1.049	1.059
17	West/Central L.A.	1.000	1.007	1.014	1.024	1.034	1.044
18	South Bay/LAX	1.000	1.013	1.026	1.035	1.044	1.053
19	Palos Verdes	1.000	1.025	1.051	1.061	1.071	1.081
20	Long Beach	1.000	1.076	1.152	1.160	1.168	1.177
21	Vernon	1.000	1.073	1.146	1.158	1.170	1.182
22	Downey	1.000	1.052	1.104	1.116	1.127	1.139
23	Downtown L.A.	1.000	1.009	1.018	1.030	1.042	1.054
24	Glendale	1.000	1.014	1.027	1.041	1.055	1.068
25	Pasadena	1.000	1.041	1.082	1.098	1.115	1.131
26	West Covina	1.000	1.023	1.046	1.066	1.086	1.106
27	Pomona	1.000	1.081	1.161	1.190	1.219	1.248

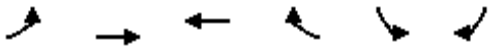

Regional Statistical Areas (RSA's)
LARTS Modeling Region
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APPENDIX J

Existing Plus Project Conditions
Intersection Analysis Worksheets

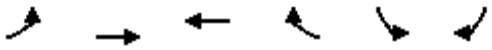
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	374	0	118	1201	1005	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	394	0	124	1264	1058	219
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	394	0	124	1264	1058	219
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	43.7		7.4	55.1	36.9	100.0
Effective Green, g (s)	43.7		7.4	55.1	36.9	100.0
Actuated g/C Ratio	0.44		0.07	0.55	0.37	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1577		259	1989	1292	1615
v/s Ratio Prot	0.11		0.04	c0.35	c0.30	
v/s Ratio Perm						0.14
v/c Ratio	0.25		0.48	0.64	0.82	0.14
Uniform Delay, d1	17.8		44.4	15.5	28.5	0.0
Progression Factor	1.00		1.47	0.42	1.00	1.00
Incremental Delay, d2	0.4		0.6	1.3	4.2	0.2
Delay (s)	18.2		65.7	7.7	32.7	0.2
Level of Service	B		E	A	C	A
Approach Delay (s)	18.2			12.9	27.1	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	233	356	1181	534	99	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	271	414	1373	621	115	197
RTOR Reduction (vph)	0	0	0	240	0	179
Lane Group Flow (vph)	271	414	1373	381	115	18
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	80.4	59.4	59.4	9.1	9.1
Effective Green, g (s)	18.0	80.4	59.4	59.4	9.1	9.1
Actuated g/C Ratio	0.18	0.80	0.59	0.59	0.09	0.09
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2902	2144	959	318	146
v/s Ratio Prot	c0.15	0.11	c0.38		c0.03	
v/s Ratio Perm				0.24		0.01
v/c Ratio	0.84	0.14	0.64	0.40	0.36	0.12
Uniform Delay, d1	39.6	2.2	13.3	10.8	42.7	41.8
Progression Factor	0.73	1.30	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.0	0.1	1.5	1.2	0.7	0.4
Delay (s)	44.8	2.9	14.8	12.0	43.4	42.2
Level of Service	D	A	B	B	D	D
Approach Delay (s)		19.5	13.9		42.6	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	435	1279	0	541	432
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	500	1470	0	622	497
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	500	1470	0	622	497
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		30.5	30.5		19.9	60.0
Effective Green, g (s)		30.5	30.5		19.9	60.0
Actuated g/C Ratio		0.51	0.51		0.33	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2636	1835		598	1615
v/s Ratio Prot		0.10	c0.41		c0.34	
v/s Ratio Perm						0.31
v/c Ratio		0.19	0.80		1.04	0.31
Uniform Delay, d1		8.0	12.2		20.0	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	3.8		47.6	0.5
Delay (s)		8.2	16.0		67.7	0.5
Level of Service		A	B		E	A
Approach Delay (s)		8.2	16.0		37.8	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	654	74	0	1279	586	0	0	43	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	688	78	0	1346	617	0	0	45	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	1346			766			1362	2035	344	1736	2113	673
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1346			742			1344	2024	316	1722	2103	673
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	93	100	100	100
cM capacity (veh/h)	518			865			111	58	679	54	52	402

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	344	344	78	673	673	617	45
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	78	0	0	617	45
cSH	1700	1700	1700	1700	1700	1700	679
Volume to Capacity	0.20	0.20	0.05	0.40	0.40	0.36	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.7
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.7
Approach LOS							B

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	39.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	471	212	129	1725	169	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.47	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	890	3610	3502	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	501	226	137	1835	180	107
RTOR Reduction (vph)	0	43	0	0	0	96
Lane Group Flow (vph)	501	183	137	1835	180	11
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	81.0	81.0	81.0	81.0	10.5	10.5
Effective Green, g (s)	81.0	81.0	81.0	81.0	10.5	10.5
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.10	0.10
Clearance Time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	2924	1308	720	2924	367	169
v/s Ratio Prot	0.14			c0.51	c0.05	
v/s Ratio Perm		0.11	0.15			0.01
v/c Ratio	0.17	0.14	0.19	0.63	0.49	0.07
Uniform Delay, d1	2.1	2.0	2.1	3.7	42.2	40.3
Progression Factor	1.00	1.00	0.87	1.24	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.5	0.8	1.0	0.2
Delay (s)	2.2	2.3	2.3	5.3	43.3	40.5
Level of Service	A	A	A	A	D	D
Approach Delay (s)	2.2			5.1	42.2	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	160	9	116	240	10	3	2	103	3	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85			0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	
Satd. Flow (prot)	1805	3581		1805	3588		1805	1620			1770	
Flt Permitted	0.58	1.00		0.64	1.00		0.76	1.00			0.81	
Satd. Flow (perm)	1110	3581		1208	3588		1435	1620			1482	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	174	10	126	261	11	3	2	112	3	0	1
RTOR Reduction (vph)	0	2	0	0	2	0	0	102	0	0	4	0
Lane Group Flow (vph)	8	182	0	126	270	0	3	12	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Effective Green, g (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	867	2799		944	2804		133	151			138	
v/s Ratio Prot		0.05			0.08			c0.01				
v/s Ratio Perm	0.01			c0.10			0.00				0.00	
v/c Ratio	0.01	0.06		0.13	0.10		0.02	0.08			0.00	
Uniform Delay, d1	1.4	1.5		1.6	1.5		24.7	24.9			24.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.0		0.3	0.1		0.1	0.2			0.0	
Delay (s)	1.5	1.6		1.9	1.6		24.8	25.1			24.7	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.5			1.7			25.1			24.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



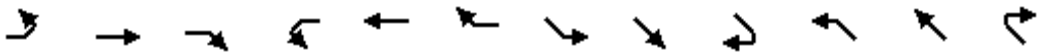
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	283	567	917	1311	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	1.00	1.00
Adj. Flow (vph)	301	603	976	1395	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	301	603	976	1395	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	17.5	60.0	31.4	60.0		
Effective Green, g (s)	17.5	60.0	31.4	54.5		
Actuated g/C Ratio	0.29	1.00	0.52	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1052	1615	944	3279		
v/s Ratio Prot	0.08		c0.54	0.39		
v/s Ratio Perm		c0.37				
v/c Ratio	0.29	0.37	1.03	0.43		
Uniform Delay, d1	16.4	0.0	14.3	0.4		
Progression Factor	1.00	1.00	0.82	1.00		
Incremental Delay, d2	0.2	0.7	37.3	0.1		
Delay (s)	16.6	0.7	49.0	0.5		
Level of Service	B	A	D	A		
Approach Delay (s)	6.0			20.5	0.0	
Approach LOS	A			C	A	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	745	0	0	590	0	283	0	0	1638	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	793	0	0	628	0	301	0	0	1743	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.80	0.80	0.94	0.80	0.80	0.77	0.77			0.94		
vC, conflicting volume	1800	2044	151	2686	2044	871	1743			301		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1175	1481	0	2289	1481	225	1361			141		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	23	100	100	0	100			100		
cM capacity (veh/h)	0	101	1030	4	101	602	392			1373		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	793	628	151	151	871	871
Volume Left	0	0	0	0	0	0
Volume Right	793	628	0	0	0	0
cSH	1030	602	1700	1700	1700	1700
Volume to Capacity	0.77	1.04	0.09	0.09	0.51	0.51
Queue Length 95th (ft)	198	426	0	0	0	0
Control Delay (s)	19.1	74.6	0.0	0.0	0.0	0.0
Lane LOS	C	F				
Approach Delay (s)	19.1	74.6	0.0		0.0	
Approach LOS	C	F				

Intersection Summary				
Average Delay	17.9			
Intersection Capacity Utilization	88.5%	ICU Level of Service		E
Analysis Period (min)	15			



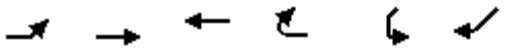
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	745	0	0	590	0	283	0	0	1638	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	793	0	0	628	0	301	0	0	1743	0
RTOR Reduction (vph)	0	0	439	0	0	10	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	354	0	0	618	0	301	0	0	1743	0
Turn Type			Perm			Perm		NA			NA	
Protected Phases								6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			25.2			25.2		26.8			26.8	
Effective Green, g (s)			25.2			25.2		26.8			26.8	
Actuated g/C Ratio			0.42			0.42		0.45			0.45	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1193			690		1612			2316	
v/s Ratio Prot								0.08			c0.34	
v/s Ratio Perm			0.12			c0.38						
v/c Ratio			0.30			0.90		0.19			0.75	
Uniform Delay, d1			11.5			16.2		10.0			13.8	
Progression Factor			1.00			1.00		0.33			1.18	
Incremental Delay, d2			0.1			14.1		0.2			1.9	
Delay (s)			11.7			30.3		3.5			18.3	
Level of Service			B			C		A			B	
Approach Delay (s)		11.7			30.3			3.5			18.3	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	943	84	25	1528	110	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3610	1615	1805	3610	1763	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	3610	1615	1805	3610	1763	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	993	88	26	1608	116	47
RTOR Reduction (vph)	0	17	0	0	33	0
Lane Group Flow (vph)	993	71	26	1608	130	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	38.9	38.9	2.0	43.9	8.6	
Effective Green, g (s)	38.9	38.9	2.0	43.9	8.6	
Actuated g/C Ratio	0.65	0.65	0.03	0.73	0.14	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2340	1047	60	2641	252	
v/s Ratio Prot	0.28		0.01	c0.45	c0.07	
v/s Ratio Perm		0.04				
v/c Ratio	0.42	0.07	0.43	0.61	0.51	
Uniform Delay, d1	5.1	3.9	28.4	3.9	23.8	
Progression Factor	0.79	0.58	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.1	1.8	1.1	1.8	
Delay (s)	4.6	2.4	30.3	5.0	25.5	
Level of Service	A	A	C	A	C	
Approach Delay (s)	4.4			5.4	25.5	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



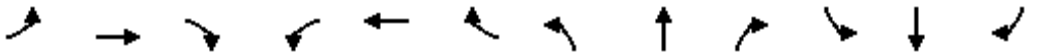
Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	72	916	1457	24	2	97
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	75	954	1518	25	2	101
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.66				0.72	0.66
vC, conflicting volume	1543				2145	759
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	785				1049	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				99	86
cM capacity (veh/h)	554				141	718

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	75	477	477	759	759	25	103
Volume Left	75	0	0	0	0	0	2
Volume Right	0	0	0	0	0	25	101
cSH	554	1700	1700	1700	1700	1700	663
Volume to Capacity	0.14	0.28	0.28	0.45	0.45	0.01	0.16
Queue Length 95th (ft)	12	0	0	0	0	0	14
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	0.0	11.4
Lane LOS	B						B
Approach Delay (s)	0.9			0.0			11.4
Approach LOS							B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

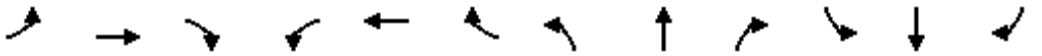
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	135	713	69	222	1330	3	26	37	158	9	61	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3171		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3171		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	150	792	77	247	1478	3	29	41	176	10	68	138
RTOR Reduction (vph)	0	0	35	0	0	1	0	155	0	0	0	111
Lane Group Flow (vph)	150	792	42	247	1478	2	29	62	0	10	68	27
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	19.3	54.6	54.6	16.4	51.7	51.7	2.9	12.1		0.9	10.1	19.3
Effective Green, g (s)	19.3	54.6	54.6	16.4	51.7	51.7	2.9	12.1		0.9	10.1	19.3
Actuated g/C Ratio	0.19	0.55	0.55	0.16	0.52	0.52	0.03	0.12		0.01	0.10	0.19
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	348	1971	881	296	1866	834	52	383		16	364	311
v/s Ratio Prot	0.08	c0.22		c0.14	c0.41		c0.02	c0.02		0.01	0.02	
v/s Ratio Perm			0.03			0.00						0.02
v/c Ratio	0.43	0.40	0.05	0.83	0.79	0.00	0.56	0.16		0.62	0.19	0.09
Uniform Delay, d1	35.5	13.2	10.6	40.5	19.8	11.7	47.9	39.4		49.4	41.2	33.1
Progression Factor	1.00	1.00	1.00	1.29	0.54	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.6	0.1	14.4	2.9	0.0	7.2	0.3		44.0	0.4	0.0
Delay (s)	35.8	13.8	10.7	66.6	13.5	11.7	55.1	39.8		93.4	41.6	33.2
Level of Service	D	B	B	E	B	B	E	D		F	D	C
Approach Delay (s)		16.8			21.1			41.6			38.6	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



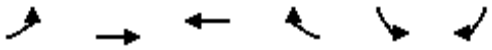
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	641	38	33	1502	20	19	81	27	8	22	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1832		1805	1900	1615
Flt Permitted	0.11	1.00	1.00	0.37	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (perm)	206	3610	1615	712	3610	1615		1832		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	13	689	41	35	1615	22	20	87	29	9	24	86
RTOR Reduction (vph)	0	0	9	0	0	6	0	11	0	0	0	81
Lane Group Flow (vph)	13	689	32	35	1615	16	0	125	0	9	24	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	71.4	71.4	71.4	71.4	71.4	71.4		12.1		6.0	6.0	6.0
Effective Green, g (s)	71.4	71.4	71.4	71.4	71.4	71.4		12.1		6.0	6.0	6.0
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71		0.12		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	147	2577	1153	508	2577	1153		221		108	114	96
v/s Ratio Prot		0.19			c0.45			c0.07		0.00	c0.01	
v/s Ratio Perm	0.06		0.02	0.05		0.01						0.00
v/c Ratio	0.09	0.27	0.03	0.07	0.63	0.01		0.56		0.08	0.21	0.05
Uniform Delay, d1	4.4	5.1	4.2	4.3	7.4	4.1		41.5		44.4	44.7	44.3
Progression Factor	1.40	1.20	1.69	0.92	0.63	1.21		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	0.0	0.2	0.9	0.0		3.3		0.3	0.9	0.2
Delay (s)	7.2	6.3	7.1	4.1	5.6	5.0		44.7		44.7	45.7	44.6
Level of Service	A	A	A	A	A	A		D		D	D	D
Approach Delay (s)		6.4			5.5			44.7			44.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	593	56	125	1390	43	206	10	169	12	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	3502	1631		1805	1661	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	3502	1631		1805	1661	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	645	61	136	1511	47	224	11	184	13	4	21
RTOR Reduction (vph)	0	0	27	0	0	17	0	161	0	0	20	0
Lane Group Flow (vph)	47	645	34	136	1511	30	224	34	0	13	5	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	7.0	55.3	55.3	14.8	63.1	63.1	9.7	12.6		0.8	3.7	
Effective Green, g (s)	7.0	55.3	55.3	14.8	63.1	63.1	9.7	12.6		0.8	3.7	
Actuated g/C Ratio	0.07	0.55	0.55	0.15	0.63	0.63	0.10	0.13		0.01	0.04	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	1996	893	267	2277	1019	339	205		14	61	
v/s Ratio Prot	0.03	c0.18		0.08	c0.42		c0.06	c0.02		0.01	0.00	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	0.37	0.32	0.04	0.51	0.66	0.03	0.66	0.17		0.93	0.08	
Uniform Delay, d1	44.4	12.2	10.2	39.3	11.7	6.9	43.6	39.0		49.6	46.5	
Progression Factor	1.04	1.20	1.00	0.87	0.61	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.4	0.1	1.4	1.4	0.0	4.8	0.4		201.0	0.6	
Delay (s)	47.9	15.1	10.3	35.6	8.6	7.0	48.3	39.4		250.5	47.1	
Level of Service	D	B	B	D	A	A	D	D		F	D	
Approach Delay (s)		16.7			10.7			44.2			116.7	
Approach LOS		B			B			D			F	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	80	650	1465	0	256	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	278	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	82	670	1510	0	264	96
RTOR Reduction (vph)	0	0	0	0	0	45
Lane Group Flow (vph)	82	670	1510	0	264	51
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	79.6	79.6	79.6		12.9	12.9
Effective Green, g (s)	79.6	79.6	79.6		12.9	12.9
Actuated g/C Ratio	0.80	0.80	0.80		0.13	0.13
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	221	2873	2873		451	208
v/s Ratio Prot		0.19	c0.42		c0.08	
v/s Ratio Perm	0.29					0.03
v/c Ratio	0.37	0.23	0.53		0.59	0.24
Uniform Delay, d1	3.0	2.6	3.6		41.0	39.2
Progression Factor	1.57	1.07	0.55		1.09	1.33
Incremental Delay, d2	4.6	0.2	0.4		1.9	0.6
Delay (s)	9.2	2.9	2.4		46.5	52.6
Level of Service	A	A	A		D	D
Approach Delay (s)		3.6	2.4		48.1	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	830	132	77	2421	572	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.28	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	528	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	892	142	83	2603	615	80
RTOR Reduction (vph)	0	33	0	0	0	27
Lane Group Flow (vph)	892	109	83	2603	615	53
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	343	3371	945	436
v/s Ratio Prot	0.25			c0.50	c0.18	
v/s Ratio Perm		0.07	0.16			0.03
v/c Ratio	0.38	0.10	0.24	0.77	0.65	0.12
Uniform Delay, d1	8.1	6.6	7.3	12.3	32.3	27.5
Progression Factor	0.29	0.04	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	1.7	1.8	3.5	0.6
Delay (s)	2.8	0.5	8.9	14.1	35.8	28.1
Level of Service	A	A	A	B	D	C
Approach Delay (s)	2.5			13.9	34.9	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	337	170	10	1598	255	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	355	179	11	1682	268	13
RTOR Reduction (vph)	0	58	0	0	0	10
Lane Group Flow (vph)	355	121	11	1682	268	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4
Actuated Green, G (s)	67.4	67.4	0.8	72.2	19.8	19.8
Effective Green, g (s)	67.4	67.4	0.8	72.2	19.8	19.8
Actuated g/C Ratio	0.67	0.67	0.01	0.72	0.20	0.20
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2433	1088	14	2606	357	319
v/s Ratio Prot	0.10		0.01	c0.47	c0.15	
v/s Ratio Perm		0.07				0.00
v/c Ratio	0.15	0.11	0.79	0.65	0.75	0.01
Uniform Delay, d1	5.9	5.7	49.5	7.2	37.8	32.2
Progression Factor	0.92	0.61	0.99	1.24	1.00	1.00
Incremental Delay, d2	0.1	0.2	100.4	0.8	8.6	0.0
Delay (s)	5.6	3.7	149.4	9.8	46.4	32.2
Level of Service	A	A	F	A	D	C
Approach Delay (s)	4.9			10.7	45.7	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

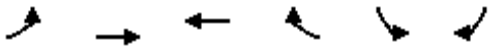
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	505	66	4	1849	5	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	532	69	4	1946	5	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	350			324		
pX, platoon unblocked			0.98		0.75	0.98
vC, conflicting volume			601		1513	266
vC1, stage 1 conf vol					532	
vC2, stage 2 conf vol					982	
vCu, unblocked vol			557		908	216
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1005		437	781

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NE 1
Volume Total	266	266	69	653	1298	7
Volume Left	0	0	0	4	0	5
Volume Right	0	0	69	0	0	2
cSH	1700	1700	1700	1005	1700	499
Volume to Capacity	0.16	0.16	0.04	0.00	0.76	0.01
Queue Length 95th (ft)	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.1	0.0	12.3
Lane LOS				A		B
Approach Delay (s)	0.0			0.0		12.3
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

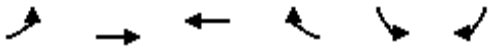
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	553	0	190	454	765	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	576	0	198	473	797	106
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	576	0	198	473	797	106
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	48.2		10.6	62.8	29.2	100.0
Effective Green, g (s)	48.2		10.6	62.8	29.2	100.0
Actuated g/C Ratio	0.48		0.11	0.63	0.29	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1740		371	2267	1022	1615
v/s Ratio Prot	c0.16		c0.06	0.13	c0.23	
v/s Ratio Perm						0.07
v/c Ratio	0.33		0.53	0.21	0.78	0.07
Uniform Delay, d1	16.0		42.4	8.0	32.5	0.0
Progression Factor	1.00		1.27	0.65	1.00	1.00
Incremental Delay, d2	0.5		0.9	0.2	3.8	0.1
Delay (s)	16.5		54.8	5.3	36.3	0.1
Level of Service	B		D	A	D	A
Approach Delay (s)	16.5			19.9	32.0	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	203	476	393	166	348	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	245	573	473	200	419	263
RTOR Reduction (vph)	0	0	0	98	0	217
Lane Group Flow (vph)	245	573	473	102	419	46
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	72.0	51.0	51.0	17.5	17.5
Effective Green, g (s)	18.0	72.0	51.0	51.0	17.5	17.5
Actuated g/C Ratio	0.18	0.72	0.51	0.51	0.18	0.18
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2599	1841	823	612	282
v/s Ratio Prot	c0.14	0.16	c0.13		c0.12	
v/s Ratio Perm				0.06		0.03
v/c Ratio	0.76	0.22	0.26	0.12	0.68	0.16
Uniform Delay, d1	38.9	4.7	13.8	12.8	38.7	35.0
Progression Factor	0.76	1.34	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	0.2	0.3	0.3	3.2	0.3
Delay (s)	37.9	6.4	14.2	13.1	41.8	35.3
Level of Service	D	A	B	B	D	D
Approach Delay (s)		15.9	13.8		39.3	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	814	332	0	413	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	925	377	0	469	261
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	925	377	0	469	261
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		31.9	31.9		18.5	60.0
Effective Green, g (s)		31.9	31.9		18.5	60.0
Actuated g/C Ratio		0.53	0.53		0.31	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2757	1919		556	1615
v/s Ratio Prot		c0.18	0.10		c0.26	
v/s Ratio Perm						0.16
v/c Ratio		0.34	0.20		0.84	0.16
Uniform Delay, d1		8.0	7.3		19.4	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.2		11.2	0.2
Delay (s)		8.3	7.6		30.6	0.2
Level of Service		A	A		C	A
Approach Delay (s)		8.3	7.6		19.7	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1070	33	0	332	438	0	0	24	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	1126	35	0	349	461	0	0	25	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked				0.89			0.89	0.89	0.89	0.89	0.89	
vC, conflicting volume	349			1161			1301	1476	563	938	1511	175
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349			930			1087	1284	257	679	1323	175
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	96	100	100	100
cM capacity (veh/h)	1221			661			154	148	665	292	140	845

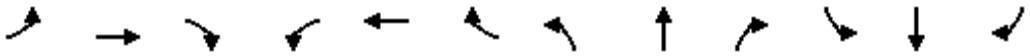
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	563	563	35	175	175	461	25
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	35	0	0	461	25
cSH	1700	1700	1700	1700	1700	1700	665
Volume to Capacity	0.33	0.33	0.02	0.10	0.10	0.27	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.6
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.6
Approach LOS							B

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	39.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	967	143	108	592	160	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.26	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	492	3610	3502	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1063	157	119	651	176	148
RTOR Reduction (vph)	0	30	0	0	0	133
Lane Group Flow (vph)	1063	127	119	651	176	15
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	81.1	81.1	81.1	81.1	10.4	10.4
Effective Green, g (s)	81.1	81.1	81.1	81.1	10.4	10.4
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.10	0.10
Clearance Time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	2927	1309	399	2927	364	167
v/s Ratio Prot	c0.29			0.18	c0.05	
v/s Ratio Perm		0.08	0.24			0.01
v/c Ratio	0.36	0.10	0.30	0.22	0.48	0.09
Uniform Delay, d1	2.5	1.9	2.4	2.2	42.3	40.5
Progression Factor	1.00	1.00	1.53	1.31	1.00	1.00
Incremental Delay, d2	0.4	0.1	1.9	0.2	1.0	0.2
Delay (s)	2.9	2.1	5.5	3.0	43.3	40.8
Level of Service	A	A	A	A	D	D
Approach Delay (s)	2.8			3.4	42.1	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	200	16	87	138	3	7	0	82	7	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	
Frt		0.99		1.00	1.00		1.00	0.85			0.93	
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)		3569		1805	3598		1805	1615			1744	
Flt Permitted		1.00		0.59	1.00		0.98	1.00			0.93	
Satd. Flow (perm)		3569		1116	3598		1862	1615			1632	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	0	247	20	107	170	4	9	0	101	9	12	25
RTOR Reduction (vph)	0	4	0	0	1	0	0	92	0	0	23	0
Lane Group Flow (vph)	0	263	0	107	173	0	9	9	0	0	23	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)		47.0		47.0	47.0		5.5	5.5			5.5	
Effective Green, g (s)		47.0		47.0	47.0		5.5	5.5			5.5	
Actuated g/C Ratio		0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)		4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)		2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		2795		874	2818		170	148			149	
v/s Ratio Prot		0.07			0.05			0.01				
v/s Ratio Perm				c0.10			0.00				c0.01	
v/c Ratio		0.09		0.12	0.06		0.05	0.06			0.16	
Uniform Delay, d1		1.5		1.6	1.5		24.9	24.9			25.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.1		0.3	0.0		0.1	0.2			0.5	
Delay (s)		1.6		1.8	1.5		25.0	25.1			25.6	
Level of Service		A		A	A		C	C			C	
Approach Delay (s)		1.6			1.6			25.1			25.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



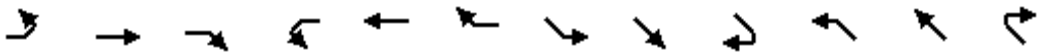
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	907	946	727	878	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	1.00	1.00
Adj. Flow (vph)	955	996	765	924	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	955	996	765	924	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.52	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	c0.26		c0.42	0.26		
v/s Ratio Perm		0.62				
v/c Ratio	0.88	0.62	0.82	0.28		
Uniform Delay, d1	20.0	0.0	12.3	0.3		
Progression Factor	1.00	1.00	0.96	1.00		
Incremental Delay, d2	8.8	1.8	8.1	0.1		
Delay (s)	28.8	1.8	19.9	0.4		
Level of Service	C	A	B	A		
Approach Delay (s)	15.0			9.2	0.0	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	820	0	0	560	0	907	0	0	1045	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	845	0	0	577	0	935	0	0	1077	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.78	0.78	0.75	0.78	0.78	0.93	0.93			0.75		
vC, conflicting volume	2051	2012	468	2390	2012	539	1077			935		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1398	1349	0	1833	1349	363	940			234		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	0	0	100	3	100			100		
cM capacity (veh/h)	3	119	814	0	119	597	688			1004		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	845	577	468	468	539	539
Volume Left	0	0	0	0	0	0
Volume Right	845	577	0	0	0	0
cSH	814	597	1700	1700	1700	1700
Volume to Capacity	1.04	0.97	0.28	0.28	0.32	0.32
Queue Length 95th (ft)	496	338	0	0	0	0
Control Delay (s)	64.2	55.3	0.0	0.0	0.0	0.0
Lane LOS	F	F				
Approach Delay (s)	64.2	55.3	0.0		0.0	
Approach LOS	F	F				

Intersection Summary				
Average Delay	25.1			
Intersection Capacity Utilization	82.5%	ICU Level of Service	E	
Analysis Period (min)	15			



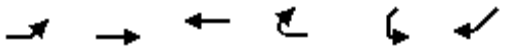
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	820	0	0	560	0	907	0	0	1045	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	845	0	0	577	0	935	0	0	1077	0
RTOR Reduction (vph)	0	0	42	0	0	14	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	803	0	0	563	0	935	0	0	1077	0
Turn Type			Perm			Perm		NA			NA	
Protected Phases								6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			24.8			24.8		27.2			27.2	
Effective Green, g (s)			24.8			24.8		27.2			27.2	
Actuated g/C Ratio			0.41			0.41		0.45			0.45	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1174			679		1636			2351	
v/s Ratio Prot								c0.26			0.21	
v/s Ratio Perm			0.28			c0.34						
v/c Ratio			0.68			0.83		0.57			0.46	
Uniform Delay, d1			14.4			15.7		12.1			11.3	
Progression Factor			1.00			1.00		2.19			1.16	
Incremental Delay, d2			1.7			8.3		0.7			0.6	
Delay (s)			16.1			24.0		27.2			13.7	
Level of Service			B			C		C			B	
Approach Delay (s)		16.1			24.0			27.2			13.7	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1707	19	0	1038	7	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	3.0	
Lane Util. Factor	0.95	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	0.91	
Flt Protected	1.00	1.00		1.00	0.99	
Satd. Flow (prot)	3610	1615		3610	1696	
Flt Permitted	1.00	1.00		1.00	0.99	
Satd. Flow (perm)	3610	1615		3610	1696	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1797	20	0	1093	7	16
RTOR Reduction (vph)	0	1	0	0	16	0
Lane Group Flow (vph)	1797	19	0	1093	7	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	51.0	51.0		51.0	1.5	
Effective Green, g (s)	51.0	51.0		51.0	1.5	
Actuated g/C Ratio	0.85	0.85		0.85	0.02	
Clearance Time (s)	4.5	4.5		4.5	3.0	
Vehicle Extension (s)	3.5	3.5		4.5	3.0	
Lane Grp Cap (vph)	3068	1372		3068	42	
v/s Ratio Prot	c0.50			0.30	c0.00	
v/s Ratio Perm		0.01				
v/c Ratio	0.59	0.01		0.36	0.18	
Uniform Delay, d1	1.3	0.7		1.0	28.6	
Progression Factor	1.43	0.43		1.00	1.00	
Incremental Delay, d2	0.7	0.0		0.3	2.0	
Delay (s)	2.7	0.3		1.3	30.7	
Level of Service	A	A		A	C	
Approach Delay (s)	2.6			1.3	30.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



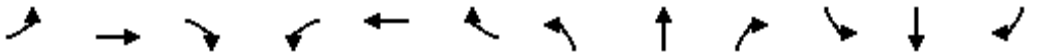
Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	29	1693	990	3	8	48
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	1840	1076	3	9	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.86				0.87	0.86
vC, conflicting volume	1079				2059	538
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	755				1168	122
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				94	93
cM capacity (veh/h)	740				157	781

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	32	920	920	538	538	3	61
Volume Left	32	0	0	0	0	0	9
Volume Right	0	0	0	0	0	3	52
cSH	740	1700	1700	1700	1700	1700	499
Volume to Capacity	0.04	0.54	0.54	0.32	0.32	0.00	0.12
Queue Length 95th (ft)	3	0	0	0	0	0	10
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0	13.2
Lane LOS	B						B
Approach Delay (s)	0.2			0.0			13.2
Approach LOS							B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

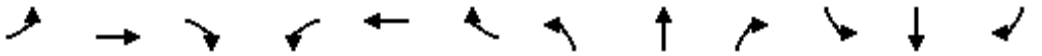
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	124	1560	17	72	776	14	89	60	375	0	13	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5			5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95			0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3143			3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3143			3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	138	1733	19	80	862	16	99	67	417	0	14	142
RTOR Reduction (vph)	0	0	7	0	0	7	0	352	0	0	0	117
Lane Group Flow (vph)	138	1733	12	80	862	9	99	132	0	0	14	25
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	17.7	64.9	64.9	6.5	53.7	53.7	10.8	15.6			1.8	17.7
Effective Green, g (s)	17.7	64.9	64.9	6.5	53.7	53.7	10.8	15.6			1.8	17.7
Actuated g/C Ratio	0.18	0.65	0.65	0.06	0.54	0.54	0.11	0.16			0.02	0.18
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5			5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5			4.5	2.0
Lane Grp Cap (vph)	319	2342	1048	117	1938	867	194	490			64	285
v/s Ratio Prot	0.08	c0.48		c0.04	0.24		c0.05	c0.04			0.00	
v/s Ratio Perm			0.01			0.01						0.02
v/c Ratio	0.43	0.74	0.01	0.68	0.44	0.01	0.51	0.27			0.22	0.09
Uniform Delay, d1	36.7	11.9	6.2	45.7	14.1	10.8	42.1	37.2			48.4	34.4
Progression Factor	1.00	1.00	1.00	1.08	0.54	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.3	2.1	0.0	12.1	0.7	0.0	0.9	0.5			3.0	0.0
Delay (s)	37.0	14.0	6.2	61.5	8.3	10.8	43.0	37.7			51.4	34.5
Level of Service	D	B	A	E	A	B	D	D			D	C
Approach Delay (s)		15.6			12.8			38.6			36.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



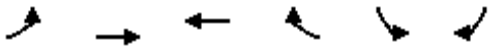
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	1954	186	44	734	17	50	30	22	36	73	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1800		1805	1900	1615
Flt Permitted	0.33	1.00	1.00	0.06	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (perm)	630	3610	1615	108	3610	1615		1800		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	49	2101	200	47	789	18	54	32	24	39	78	18
RTOR Reduction (vph)	0	0	10	0	0	5	0	13	0	0	0	17
Lane Group Flow (vph)	49	2101	190	47	789	13	0	97	0	39	78	1
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	70.5	70.5	70.5	70.5	70.5	70.5		10.7		8.3	8.3	8.3
Effective Green, g (s)	70.5	70.5	70.5	70.5	70.5	70.5		10.7		8.3	8.3	8.3
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70		0.11		0.08	0.08	0.08
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	444	2545	1138	76	2545	1138		192		149	157	134
v/s Ratio Prot		c0.58			0.22			c0.05		0.02	c0.04	
v/s Ratio Perm	0.08		0.12	0.44		0.01						0.00
v/c Ratio	0.11	0.83	0.17	0.62	0.31	0.01		0.51		0.26	0.50	0.01
Uniform Delay, d1	4.7	10.4	4.9	7.7	5.6	4.4		42.2		43.0	43.9	42.1
Progression Factor	1.25	0.89	1.24	0.89	0.64	0.43		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	2.7	0.3	31.5	0.3	0.0		2.1		0.9	2.5	0.0
Delay (s)	6.3	11.9	6.4	38.3	3.9	1.9		44.3		43.9	46.3	42.1
Level of Service	A	B	A	D	A	A		D		D	D	D
Approach Delay (s)		11.3			5.7			44.3			45.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1642	361	226	678	23	77	5	119	23	7	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	3502	1626		1805	1664	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	3502	1626		1805	1664	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	1785	392	246	737	25	84	5	129	25	8	39
RTOR Reduction (vph)	0	0	45	0	0	8	0	118	0	0	36	0
Lane Group Flow (vph)	25	1785	347	246	737	17	84	16	0	25	11	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	3.3	56.6	56.6	16.4	69.7	69.7	3.5	8.9		1.6	7.0	
Effective Green, g (s)	3.3	56.6	56.6	16.4	69.7	69.7	3.5	8.9		1.6	7.0	
Actuated g/C Ratio	0.03	0.57	0.57	0.16	0.70	0.70	0.04	0.09		0.02	0.07	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	59	2043	914	296	2516	1125	122	144		28	116	
v/s Ratio Prot	0.01	c0.49		c0.14	0.20		c0.02	c0.01		0.01	0.01	
v/s Ratio Perm			0.21			0.01						
v/c Ratio	0.42	0.87	0.38	0.83	0.29	0.02	0.69	0.11		0.89	0.09	
Uniform Delay, d1	47.4	18.6	12.0	40.5	5.8	4.6	47.7	41.9		49.1	43.5	
Progression Factor	0.97	1.17	1.55	0.85	0.63	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	3.4	0.7	17.0	0.3	0.0	15.0	0.4		123.8	0.3	
Delay (s)	48.7	25.2	19.2	51.3	3.9	4.7	62.7	42.3		172.9	43.9	
Level of Service	D	C	B	D	A	A	E	D		F	D	
Approach Delay (s)		24.4			15.5			50.1			88.7	
Approach LOS		C			B			D			F	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	57	1748	801	0	732	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.29	1.00	1.00		0.95	1.00
Satd. Flow (perm)	557	3610	3610		3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	1900	871	0	796	138
RTOR Reduction (vph)	0	0	0	0	0	98
Lane Group Flow (vph)	62	1900	871	0	796	40
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	67.2	67.2	67.2		25.3	25.3
Effective Green, g (s)	67.2	67.2	67.2		25.3	25.3
Actuated g/C Ratio	0.67	0.67	0.67		0.25	0.25
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	374	2425	2425		886	408
v/s Ratio Prot		c0.53	0.24		c0.23	
v/s Ratio Perm	0.11					0.02
v/c Ratio	0.17	0.78	0.36		0.90	0.10
Uniform Delay, d1	6.1	11.4	7.1		36.1	28.6
Progression Factor	0.67	1.48	1.24		0.74	0.62
Incremental Delay, d2	0.6	1.7	0.4		11.3	0.1
Delay (s)	4.7	18.5	9.2		38.0	17.7
Level of Service	A	B	A		D	B
Approach Delay (s)		18.0	9.2		35.0	
Approach LOS		B	A		D	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2106	351	68	1001	221	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	117	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	2265	377	73	1076	238	99
RTOR Reduction (vph)	0	34	0	0	0	7
Lane Group Flow (vph)	2265	343	73	1076	238	92
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	76	3371	945	436
v/s Ratio Prot	c0.63			0.21	c0.07	
v/s Ratio Perm		0.21	0.62			0.06
v/c Ratio	0.97	0.33	0.96	0.32	0.25	0.21
Uniform Delay, d1	16.4	7.8	16.3	7.7	28.6	28.3
Progression Factor	0.87	1.12	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.2	0.5	92.7	0.3	0.6	1.1
Delay (s)	22.4	9.2	109.0	8.0	29.2	29.4
Level of Service	C	A	F	A	C	C
Approach Delay (s)	20.5			14.4	29.3	
Approach LOS	C			B	C	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	846	219	15	463	235	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	891	231	16	487	247	14
RTOR Reduction (vph)	0	79	0	0	0	11
Lane Group Flow (vph)	891	152	16	487	247	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4
Actuated Green, G (s)	65.9	65.9	3.0	72.9	19.1	19.1
Effective Green, g (s)	65.9	65.9	3.0	72.9	19.1	19.1
Actuated g/C Ratio	0.66	0.66	0.03	0.73	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2378	1064	54	2631	344	308
v/s Ratio Prot	c0.25		c0.01	0.13	c0.14	
v/s Ratio Perm		0.09				0.00
v/c Ratio	0.37	0.14	0.30	0.19	0.72	0.01
Uniform Delay, d1	7.7	6.4	47.5	4.2	37.9	32.8
Progression Factor	0.88	0.67	1.00	1.02	1.00	1.00
Incremental Delay, d2	0.4	0.3	3.0	0.2	7.0	0.0
Delay (s)	7.2	4.6	50.4	4.5	44.9	32.8
Level of Service	A	A	D	A	D	C
Approach Delay (s)	6.7			5.9	44.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



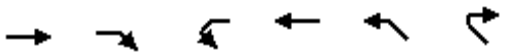
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	1063	40	4	694	6	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1119	42	4	731	6	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	350			324		
pX, platoon unblocked			0.92		0.94	0.92
vC, conflicting volume			1161		1493	559
vC1, stage 1 conf vol					1119	
vC2, stage 2 conf vol					374	
vCu, unblocked vol			1007		1214	356
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	100
cM capacity (veh/h)			642		296	597

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NE 1
Volume Total	559	559	42	248	487	8
Volume Left	0	0	0	4	0	6
Volume Right	0	0	42	0	0	2
cSH	1700	1700	1700	642	1700	338
Volume to Capacity	0.33	0.33	0.02	0.01	0.29	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.3	0.0	15.9
Lane LOS				A		C
Approach Delay (s)	0.0			0.1		15.9
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		

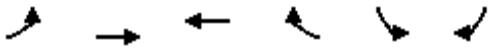
APPENDIX K

Interim Year (2016) Without Project Conditions
Intersection Analysis Worksheets



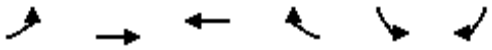
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	431	0	125	1303	1090	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	454	0	132	1372	1147	232
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	454	0	132	1372	1147	232
Turn Type	NA		Prot	NA	NA	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	42.1		7.3	53.4	38.6	100.0
Effective Green, g (s)	42.1		7.3	53.4	38.6	100.0
Actuated g/C Ratio	0.42		0.07	0.53	0.39	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1519		255	1927	1351	1615
v/s Ratio Prot	0.13		0.04	c0.38	c0.33	
v/s Ratio Perm						0.14
v/c Ratio	0.30		0.52	0.71	0.85	0.14
Uniform Delay, d1	19.2		44.7	17.5	28.0	0.0
Progression Factor	1.00		1.45	0.42	1.00	1.00
Incremental Delay, d2	0.5		0.7	1.7	5.2	0.2
Delay (s)	19.7		65.7	9.1	33.2	0.2
Level of Service	B		E	A	C	A
Approach Delay (s)	19.7			14.1	27.7	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	247	412	1282	565	104	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	287	479	1491	657	121	208
RTOR Reduction (vph)	0	0	0	234	0	189
Lane Group Flow (vph)	287	479	1491	423	121	19
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	80.3	59.3	59.3	9.2	9.2
Effective Green, g (s)	18.0	80.3	59.3	59.3	9.2	9.2
Actuated g/C Ratio	0.18	0.80	0.59	0.59	0.09	0.09
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2898	2140	957	322	148
v/s Ratio Prot	c0.16	0.13	c0.41		c0.03	
v/s Ratio Perm				0.26		0.01
v/c Ratio	0.89	0.17	0.70	0.44	0.38	0.13
Uniform Delay, d1	40.0	2.2	14.1	11.2	42.7	41.7
Progression Factor	0.73	1.60	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.0	0.1	1.9	1.5	0.7	0.4
Delay (s)	52.2	3.7	16.0	12.7	43.4	42.1
Level of Service	D	A	B	B	D	D
Approach Delay (s)		21.9	15.0		42.6	
Approach LOS		C	B		D	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	495	1386	0	453	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	569	1593	0	521	526
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	569	1593	0	521	526
Turn Type		NA	NA		NA	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		31.1	31.1		19.3	60.0
Effective Green, g (s)		31.1	31.1		19.3	60.0
Actuated g/C Ratio		0.52	0.52		0.32	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2688	1871		580	1615
v/s Ratio Prot		0.11	c0.44		c0.29	
v/s Ratio Perm						0.33
v/c Ratio		0.21	0.85		0.90	0.33
Uniform Delay, d1		7.8	12.5		19.4	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	5.1		16.6	0.5
Delay (s)		8.0	17.6		36.0	0.5
Level of Service		A	B		D	A
Approach Delay (s)		8.0	17.6		18.2	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	603	80	0	1386	498	0	0	46	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	635	84	0	1459	524	0	0	48	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked												
vC, conflicting volume	1459			719			1364	2094	317	1825	2178	729
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1459			719			1364	2094	317	1825	2178	729
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	93	100	100	100
cM capacity (veh/h)	469			892			108	53	684	46	47	370

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	317	317	84	729	729	524	48
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	84	0	0	524	48
cSH	1700	1700	1700	1700	1700	1700	684
Volume to Capacity	0.19	0.19	0.05	0.43	0.43	0.31	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.7
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.7
Approach LOS							B

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	41.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	384	248	20	1717	199	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.51	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	973	3610	3502	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	409	264	21	1827	212	1
RTOR Reduction (vph)	0	53	0	0	0	1
Lane Group Flow (vph)	409	211	21	1827	212	0
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	80.1	80.1	80.1	80.1	11.4	11.4
Effective Green, g (s)	80.1	80.1	80.1	80.1	11.4	11.4
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.11	0.11
Clearance Time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	2891	1293	779	2891	399	184
v/s Ratio Prot	0.11			c0.51	c0.06	
v/s Ratio Perm		0.13	0.02			0.00
v/c Ratio	0.14	0.16	0.03	0.63	0.53	0.00
Uniform Delay, d1	2.2	2.3	2.0	4.0	41.8	39.3
Progression Factor	1.00	1.00	1.27	0.96	1.00	1.00
Incremental Delay, d2	0.1	0.3	0.0	0.6	1.4	0.0
Delay (s)	2.3	2.6	2.6	4.5	43.1	39.3
Level of Service	A	A	A	A	D	D
Approach Delay (s)	2.4			4.4	43.1	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	89	10	122	163	10	3	2	105	2	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.85			0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3555		1805	3578		1805	1620			1672	
Flt Permitted	0.63	1.00		0.68	1.00		0.75	1.00			0.95	
Satd. Flow (perm)	1203	3555		1299	3578		1424	1620			1596	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	97	11	133	177	11	3	2	114	2	0	10
RTOR Reduction (vph)	0	2	0	0	2	0	0	103	0	0	11	0
Lane Group Flow (vph)	15	106	0	133	186	0	3	13	0	0	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Effective Green, g (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	940	2778		1015	2796		132	151			148	
v/s Ratio Prot		0.03			0.05			c0.01				
v/s Ratio Perm	0.01			c0.10			0.00				0.00	
v/c Ratio	0.02	0.04		0.13	0.07		0.02	0.08			0.01	
Uniform Delay, d1	1.4	1.5		1.6	1.5		24.7	24.9			24.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.0		0.3	0.0		0.1	0.2			0.0	
Delay (s)	1.5	1.5		1.9	1.6		24.8	25.1			24.7	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.5			1.7			25.1			24.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



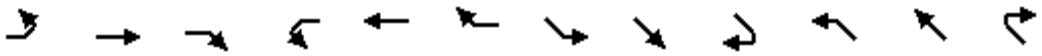
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	332	601	901	1423	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	1.00	1.00
Adj. Flow (vph)	353	639	959	1514	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	353	639	959	1514	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.51	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	0.10		c0.53	c0.42		
v/s Ratio Perm		0.40				
v/c Ratio	0.33	0.40	1.03	0.46		
Uniform Delay, d1	16.3	0.0	14.6	0.4		
Progression Factor	1.00	1.00	0.80	1.00		
Incremental Delay, d2	0.2	0.7	37.0	0.1		
Delay (s)	16.5	0.7	48.6	0.6		
Level of Service	B	A	D	A		
Approach Delay (s)	6.4			19.2	0.0	
Approach LOS	A			B	A	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	716	0	0	625	0	332	0	0	1698	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	762	0	0	665	0	353	0	0	1806	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.77	0.77	0.93	0.77	0.77	0.74	0.74			0.93		
vC, conflicting volume	1921	2160	177	2745	2160	903	1806			353		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1228	1535	0	2290	1535	174	1391			168		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	25	100	100	0	100			100		
cM capacity (veh/h)	0	91	1020	4	91	627	370			1329		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	762	665	177	177	903	903
Volume Left	0	0	0	0	0	0
Volume Right	762	665	0	0	0	0
cSH	1020	627	1700	1700	1700	1700
Volume to Capacity	0.75	1.06	0.10	0.10	0.53	0.53
Queue Length 95th (ft)	181	458	0	0	0	0
Control Delay (s)	18.1	78.3	0.0	0.0	0.0	0.0
Lane LOS	C	F				
Approach Delay (s)	18.1	78.3	0.0		0.0	
Approach LOS	C	F				

Intersection Summary				
Average Delay	18.4			
Intersection Capacity Utilization	92.3%	ICU Level of Service		F
Analysis Period (min)	15			

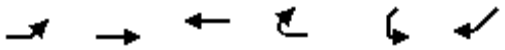


Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	716	0	0	625	0	332	0	0	1698	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	762	0	0	665	0	353	0	0	1806	0
RTOR Reduction (vph)	0	0	343	0	0	10	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	419	0	0	655	0	353	0	0	1806	0
Turn Type			custom			custom		NA			NA	
Protected Phases								6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			26.4			26.4		25.6			25.6	
Effective Green, g (s)			26.4			26.4		25.6			25.6	
Actuated g/C Ratio			0.44			0.44		0.43			0.43	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1250			723		1540			2213	
v/s Ratio Prot								0.10			c0.35	
v/s Ratio Perm			0.15			c0.40						
v/c Ratio			0.34			0.91		0.23			0.82	
Uniform Delay, d1			11.0			15.6		10.9			15.1	
Progression Factor			1.00			1.00		0.82			1.43	
Incremental Delay, d2			0.2			14.9		0.3			2.9	
Delay (s)			11.2			30.5		9.3			24.4	
Level of Service			B			C		A			C	
Approach Delay (s)		11.2			30.5			9.3			24.4	
Approach LOS		B			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	957	89	27	1582	117	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3610	1615	1805	3610	1763	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	3610	1615	1805	3610	1763	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1007	94	28	1665	123	51
RTOR Reduction (vph)	0	18	0	0	34	0
Lane Group Flow (vph)	1007	76	28	1665	140	0
Turn Type	NA	Perm	Prot	NA	NA	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	38.6	38.6	2.0	43.6	8.9	
Effective Green, g (s)	38.6	38.6	2.0	43.6	8.9	
Actuated g/C Ratio	0.64	0.64	0.03	0.73	0.15	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2322	1038	60	2623	261	
v/s Ratio Prot	0.28		0.02	c0.46	c0.08	
v/s Ratio Perm		0.05				
v/c Ratio	0.43	0.07	0.47	0.63	0.54	
Uniform Delay, d1	5.3	4.0	28.5	4.2	23.6	
Progression Factor	0.77	0.52	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.1	2.1	1.2	2.1	
Delay (s)	4.7	2.2	30.6	5.3	25.8	
Level of Service	A	A	C	A	C	
Approach Delay (s)	4.4			5.8	25.8	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	78	926	1505	34	10	104
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	81	965	1568	35	10	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.64				0.70	0.64
vC, conflicting volume	1603				2212	784
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	812				1069	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				92	84
cM capacity (veh/h)	526				130	696

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	81	482	482	784	784	35	119
Volume Left	81	0	0	0	0	0	10
Volume Right	0	0	0	0	0	35	108
cSH	526	1700	1700	1700	1700	1700	504
Volume to Capacity	0.15	0.28	0.28	0.46	0.46	0.02	0.24
Queue Length 95th (ft)	14	0	0	0	0	0	23
Control Delay (s)	13.1	0.0	0.0	0.0	0.0	0.0	14.3
Lane LOS	B						B
Approach Delay (s)	1.0			0.0			14.3
Approach LOS							B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	113	751	73	233	1423	49	28	45	162	54	70	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3186		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3186		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	126	834	81	259	1581	54	31	50	180	60	78	97
RTOR Reduction (vph)	0	0	37	0	0	24	0	164	0	0	0	81
Lane Group Flow (vph)	126	834	44	259	1581	30	31	66	0	60	78	16
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	16.1	54.0	54.0	17.0	54.9	54.9	2.9	9.0		4.0	10.1	16.1
Effective Green, g (s)	16.1	54.0	54.0	17.0	54.9	54.9	2.9	9.0		4.0	10.1	16.1
Actuated g/C Ratio	0.16	0.54	0.54	0.17	0.55	0.55	0.03	0.09		0.04	0.10	0.16
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	290	1949	872	306	1981	886	52	286		72	364	260
v/s Ratio Prot	0.07	0.23		c0.14	c0.44		0.02	0.02		c0.03	c0.02	
v/s Ratio Perm			0.03			0.02						0.01
v/c Ratio	0.43	0.43	0.05	0.85	0.80	0.03	0.60	0.23		0.83	0.21	0.06
Uniform Delay, d1	37.8	13.8	10.9	40.2	18.1	10.4	48.0	42.3		47.7	41.3	35.5
Progression Factor	1.00	1.00	1.00	1.34	0.53	0.35	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.7	0.1	14.4	2.6	0.1	11.6	0.7		51.5	0.5	0.0
Delay (s)	38.2	14.4	11.0	68.2	12.2	3.7	59.6	43.0		99.1	41.8	35.6
Level of Service	D	B	B	E	B	A	E	D		F	D	D
Approach Delay (s)		17.1			19.6			45.0			53.9	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

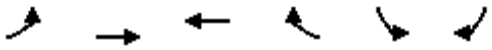
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	705	47	33	1641	18	28	85	23	8	22	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1837		1805	1900	1615
Flt Permitted	0.08	1.00	1.00	0.34	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (perm)	156	3610	1615	654	3610	1615		1837		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	14	758	51	35	1765	19	30	91	25	9	24	91
RTOR Reduction (vph)	0	0	10	0	0	6	0	9	0	0	0	86
Lane Group Flow (vph)	14	758	41	35	1765	13	0	137	0	9	24	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	70.7	70.7	70.7	70.7	70.7	70.7		12.8		6.0	6.0	6.0
Effective Green, g (s)	70.7	70.7	70.7	70.7	70.7	70.7		12.8		6.0	6.0	6.0
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71		0.13		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	110	2552	1141	462	2552	1141		235		108	114	96
v/s Ratio Prot		0.21			c0.49			c0.07		0.00	c0.01	
v/s Ratio Perm	0.09		0.03	0.05		0.01						0.00
v/c Ratio	0.13	0.30	0.04	0.08	0.69	0.01		0.58		0.08	0.21	0.06
Uniform Delay, d1	4.7	5.4	4.4	4.5	8.4	4.3		41.1		44.4	44.7	44.3
Progression Factor	1.47	1.25	1.69	0.81	0.60	0.88		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.2	0.3	0.1	0.3	1.3	0.0		3.7		0.3	0.9	0.2
Delay (s)	9.1	7.0	7.5	3.9	6.3	3.8		44.8		44.7	45.7	44.6
Level of Service	A	A	A	A	A	A		D		D	D	D
Approach Delay (s)		7.1			6.3			44.8			44.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	688	66	134	1529	226	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	748	72	146	1662	246	198
RTOR Reduction (vph)	0	19	0	0	0	174
Lane Group Flow (vph)	748	53	146	1662	246	24
Turn Type	NA	Perm	Prot	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	56.6	56.6	19.0	79.6	11.9	11.9
Effective Green, g (s)	56.6	56.6	19.0	79.6	11.9	11.9
Actuated g/C Ratio	0.57	0.57	0.19	0.80	0.12	0.12
Clearance Time (s)	4.5	4.5	4.0	4.5	4.0	4.0
Vehicle Extension (s)	4.5	4.5	3.0	4.5	3.0	3.0
Lane Grp Cap (vph)	2043	914	342	2873	416	192
v/s Ratio Prot	0.21		0.08	c0.46	c0.07	
v/s Ratio Perm		0.03				0.01
v/c Ratio	0.37	0.06	0.43	0.58	0.59	0.12
Uniform Delay, d1	11.9	9.7	35.7	3.9	41.7	39.4
Progression Factor	1.09	1.28	0.87	0.57	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.7	0.7	2.3	0.3
Delay (s)	13.4	12.6	31.7	2.9	44.0	39.7
Level of Service	B	B	C	A	D	D
Approach Delay (s)	13.3			5.3	42.1	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	74	749	1599	0	321	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	224	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	76	772	1648	0	331	67
RTOR Reduction (vph)	0	0	0	0	0	33
Lane Group Flow (vph)	76	772	1648	0	331	34
Turn Type	Perm	NA	NA		NA	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	77.7	77.7	77.7		14.8	14.8
Effective Green, g (s)	77.7	77.7	77.7		14.8	14.8
Actuated g/C Ratio	0.78	0.78	0.78		0.15	0.15
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	174	2804	2804		518	239
v/s Ratio Prot		0.21	c0.46		c0.09	
v/s Ratio Perm	0.34					0.02
v/c Ratio	0.44	0.28	0.59		0.64	0.14
Uniform Delay, d1	3.8	3.2	4.6		40.1	37.1
Progression Factor	1.60	0.91	0.65		0.96	0.96
Incremental Delay, d2	7.3	0.2	0.5		2.6	0.3
Delay (s)	13.3	3.1	3.5		40.9	36.0
Level of Service	B	A	A		D	D
Approach Delay (s)		4.0	3.5		40.1	
Approach LOS		A	A		D	

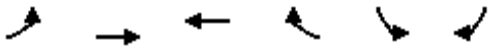
Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	958	170	82	2637	624	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.23	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	438	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1030	183	88	2835	671	84
RTOR Reduction (vph)	0	36	0	0	0	26
Lane Group Flow (vph)	1030	147	88	2835	671	58
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	284	3371	945	436
v/s Ratio Prot	0.29			c0.55	c0.19	
v/s Ratio Perm		0.09	0.20			0.04
v/c Ratio	0.44	0.14	0.31	0.84	0.71	0.13
Uniform Delay, d1	8.6	6.7	7.7	13.5	33.0	27.6
Progression Factor	0.33	0.25	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.3	2.8	2.7	4.5	0.6
Delay (s)	3.4	2.0	10.5	16.2	37.5	28.3
Level of Service	A	A	B	B	D	C
Approach Delay (s)	3.2			16.1	36.4	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

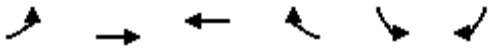
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	642	0	201	528	836	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	669	0	209	550	871	115
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	669	0	209	550	871	115
Turn Type	NA		Prot	NA	NA	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	45.7		10.7	60.4	31.6	100.0
Effective Green, g (s)	45.7		10.7	60.4	31.6	100.0
Actuated g/C Ratio	0.46		0.11	0.60	0.32	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1649		374	2180	1106	1615
v/s Ratio Prot	c0.19		c0.06	0.15	c0.25	
v/s Ratio Perm						0.07
v/c Ratio	0.41		0.56	0.25	0.79	0.07
Uniform Delay, d1	18.1		42.4	9.3	31.1	0.0
Progression Factor	1.00		1.31	0.62	1.00	1.00
Incremental Delay, d2	0.7		1.1	0.3	3.8	0.1
Delay (s)	18.8		56.7	6.0	34.9	0.1
Level of Service	B		E	A	C	A
Approach Delay (s)	18.8			20.0	30.9	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



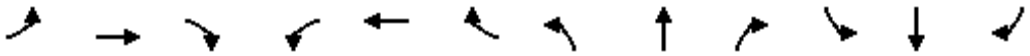
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	215	562	463	175	368	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	259	677	558	211	443	278
RTOR Reduction (vph)	0	0	0	105	0	227
Lane Group Flow (vph)	259	677	558	106	443	51
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	71.3	50.3	50.3	18.2	18.2
Effective Green, g (s)	18.0	71.3	50.3	50.3	18.2	18.2
Actuated g/C Ratio	0.18	0.71	0.50	0.50	0.18	0.18
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2573	1815	812	637	293
v/s Ratio Prot	c0.14	0.19	c0.15		c0.13	
v/s Ratio Perm				0.07		0.03
v/c Ratio	0.80	0.26	0.31	0.13	0.70	0.17
Uniform Delay, d1	39.3	5.1	14.6	13.2	38.3	34.5
Progression Factor	0.79	1.60	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.8	0.2	0.4	0.3	3.3	0.3
Delay (s)	42.7	8.4	15.0	13.6	41.6	34.8
Level of Service	D	A	B	B	D	C
Approach Delay (s)		17.9	14.6		39.0	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	919	397	0	333	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	1044	451	0	378	277
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1044	451	0	378	277
Turn Type		NA	NA		NA	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		33.6	33.6		16.8	60.0
Effective Green, g (s)		33.6	33.6		16.8	60.0
Actuated g/C Ratio		0.56	0.56		0.28	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2904	2021		505	1615
v/s Ratio Prot		c0.20	0.12		c0.21	
v/s Ratio Perm						0.17
v/c Ratio		0.36	0.22		0.75	0.17
Uniform Delay, d1		7.3	6.6		19.7	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.3		6.0	0.2
Delay (s)		7.6	6.9		25.7	0.2
Level of Service		A	A		C	A
Approach Delay (s)		7.6	6.9		14.9	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1085	35	0	397	362	0	0	26	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	1142	37	0	418	381	0	0	27	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	418			1179			1351	1560	571	1016	1597	209
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	418			925			1121	1359	233	740	1401	209
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	96	100	100	100
cM capacity (veh/h)	1152			656			143	132	681	260	124	803

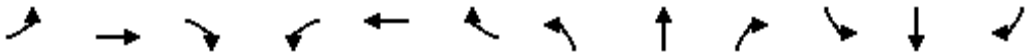
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	571	571	37	209	209	381	27
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	37	0	0	381	27
cSH	1700	1700	1700	1700	1700	1700	681
Volume to Capacity	0.34	0.34	0.02	0.12	0.12	0.22	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.5
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.5
Approach LOS							B

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	40.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	952	177	0	555	186	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	3.0	3.0
Lane Util. Factor	0.95	1.00		0.95	0.97	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3610	1615		3610	3502	1615
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	3610	1615		3610	3502	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1046	195	0	610	204	16
RTOR Reduction (vph)	0	38	0	0	0	14
Lane Group Flow (vph)	1046	157	0	610	204	2
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	80.4	80.4		80.4	11.1	11.1
Effective Green, g (s)	80.4	80.4		80.4	11.1	11.1
Actuated g/C Ratio	0.80	0.80		0.80	0.11	0.11
Clearance Time (s)	5.5	5.5		5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0		2.0	3.0	3.0
Lane Grp Cap (vph)	2902	1298		2902	388	179
v/s Ratio Prot	c0.29			0.17	c0.06	
v/s Ratio Perm		0.10				0.00
v/c Ratio	0.36	0.12		0.21	0.53	0.01
Uniform Delay, d1	2.7	2.1		2.3	42.0	39.6
Progression Factor	1.00	1.00		0.86	1.00	1.00
Incremental Delay, d2	0.3	0.2		0.2	1.3	0.0
Delay (s)	3.1	2.3		2.1	43.3	39.6
Level of Service	A	A		A	D	D
Approach Delay (s)	2.9			2.1	43.0	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	108	17	92	58	2	7	0	79	6	11	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3536		1805	3595		1805	1615			1727	
Flt Permitted	0.71	1.00		0.65	1.00		0.91	1.00			0.95	
Satd. Flow (perm)	1342	3536		1243	3595		1722	1615			1659	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	9	133	21	114	72	2	9	0	98	7	14	36
RTOR Reduction (vph)	0	5	0	0	0	0	0	89	0	0	33	0
Lane Group Flow (vph)	9	149	0	114	74	0	9	9	0	0	24	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	47.0	47.0		47.0	47.0		5.5	5.5			5.5	
Effective Green, g (s)	47.0	47.0		47.0	47.0		5.5	5.5			5.5	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	1051	2769		973	2816		157	148			152	
v/s Ratio Prot		0.04			0.02			0.01				
v/s Ratio Perm	0.01			c0.09			0.01				c0.01	
v/c Ratio	0.01	0.05		0.12	0.03		0.06	0.06			0.16	
Uniform Delay, d1	1.4	1.5		1.6	1.4		24.9	24.9			25.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.0		0.2	0.0		0.2	0.2			0.5	
Delay (s)	1.4	1.5		1.8	1.5		25.0	25.1			25.6	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.5			1.7			25.1			25.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.12		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

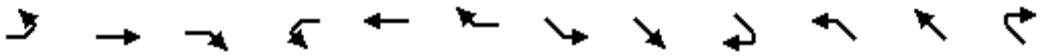
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	994	1003	697	965	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	1.00	1.00
Adj. Flow (vph)	1046	1056	734	1016	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1046	1056	734	1016	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.51	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	c0.29		c0.41	0.28		
v/s Ratio Perm		0.65				
v/c Ratio	0.97	0.65	0.79	0.31		
Uniform Delay, d1	20.7	0.0	11.9	0.4		
Progression Factor	1.00	1.00	0.96	1.00		
Incremental Delay, d2	19.5	2.1	6.7	0.1		
Delay (s)	40.2	2.1	18.2	0.4		
Level of Service	D	A	B	A		
Approach Delay (s)	21.1			7.9	0.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	787	0	0	594	0	994	0	0	1067	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	811	0	0	612	0	1025	0	0	1100	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.75	0.75	0.72	0.75	0.75	0.93	0.93			0.72		
vC, conflicting volume	2187	2125	512	2424	2125	550	1100			1025		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1513	1430	0	1827	1430	370	960			254		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	0	0	100	0	100			100		
cM capacity (veh/h)	0	102	785	0	102	590	675			951		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	811	612	512	512	550	550
Volume Left	0	0	0	0	0	0
Volume Right	811	612	0	0	0	0
cSH	785	590	1700	1700	1700	1700
Volume to Capacity	1.03	1.04	0.30	0.30	0.32	0.32
Queue Length 95th (ft)	479	416	0	0	0	0
Control Delay (s)	64.0	73.9	0.0	0.0	0.0	0.0
Lane LOS	F	F				
Approach Delay (s)	64.0	73.9	0.0		0.0	
Approach LOS	F	F				

Intersection Summary				
Average Delay	27.4			
Intersection Capacity Utilization	82.9%	ICU Level of Service	E	
Analysis Period (min)	15			

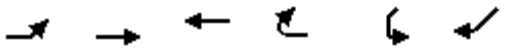


Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	820	0	0	560	0	907	0	0	1045	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	845	0	0	577	0	935	0	0	1077	0
RTOR Reduction (vph)	0	0	42	0	0	14	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	803	0	0	563	0	935	0	0	1077	0
Turn Type			custom			custom		NA			NA	
Protected Phases								6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			24.8			24.8		27.2			27.2	
Effective Green, g (s)			24.8			24.8		27.2			27.2	
Actuated g/C Ratio			0.41			0.41		0.45			0.45	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1174			679		1636			2351	
v/s Ratio Prot								c0.26			0.21	
v/s Ratio Perm			0.28			c0.34						
v/c Ratio			0.68			0.83		0.57			0.46	
Uniform Delay, d1			14.4			15.7		12.1			11.3	
Progression Factor			1.00			1.00		2.19			1.16	
Incremental Delay, d2			1.7			8.3		0.7			0.6	
Delay (s)			16.1			24.0		27.2			13.7	
Level of Service			B			C		C			B	
Approach Delay (s)		16.1			24.0			27.2			13.7	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1762	20	0	1060	7	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	3.0	
Lane Util. Factor	0.95	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	0.90	
Flt Protected	1.00	1.00		1.00	0.99	
Satd. Flow (prot)	3610	1615		3610	1694	
Flt Permitted	1.00	1.00		1.00	0.99	
Satd. Flow (perm)	3610	1615		3610	1694	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1855	21	0	1116	7	17
RTOR Reduction (vph)	0	1	0	0	17	0
Lane Group Flow (vph)	1855	20	0	1116	7	0
Turn Type	NA	Perm	Prot	NA	NA	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	51.0	51.0		51.0	1.5	
Effective Green, g (s)	51.0	51.0		51.0	1.5	
Actuated g/C Ratio	0.85	0.85		0.85	0.02	
Clearance Time (s)	4.5	4.5		4.5	3.0	
Vehicle Extension (s)	3.5	3.5		4.5	3.0	
Lane Grp Cap (vph)	3068	1372		3068	42	
v/s Ratio Prot	c0.51			0.31	c0.00	
v/s Ratio Perm		0.01				
v/c Ratio	0.60	0.01		0.36	0.18	
Uniform Delay, d1	1.4	0.7		1.0	28.6	
Progression Factor	1.63	0.39		1.00	1.00	
Incremental Delay, d2	0.8	0.0		0.3	2.0	
Delay (s)	3.0	0.3		1.3	30.7	
Level of Service	A	A		A	C	
Approach Delay (s)	3.0			1.3	30.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



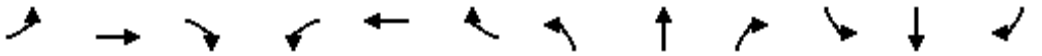
Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	31	1747	1006	10	16	55
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	1899	1093	11	17	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.84				0.85	0.84
vC, conflicting volume	1104				2110	547
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748				1122	86
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				89	93
cM capacity (veh/h)	732				165	810

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	34	949	949	547	547	11	77
Volume Left	34	0	0	0	0	0	17
Volume Right	0	0	0	0	0	11	60
cSH	732	1700	1700	1700	1700	1700	431
Volume to Capacity	0.05	0.56	0.56	0.32	0.32	0.01	0.18
Queue Length 95th (ft)	4	0	0	0	0	0	16
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	0.0	15.2
Lane LOS	B						C
Approach Delay (s)	0.2			0.0			15.2
Approach LOS							C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	80	1667	18	73	828	60	94	69	394	43	19	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3149		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3149		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	89	1852	20	81	920	67	104	77	438	48	21	104
RTOR Reduction (vph)	0	0	8	0	0	31	0	338	0	0	0	92
Lane Group Flow (vph)	89	1852	12	81	920	36	104	177	0	48	21	12
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	11.1	58.3	58.3	6.5	53.7	53.7	12.2	15.4		3.8	7.0	11.1
Effective Green, g (s)	11.1	58.3	58.3	6.5	53.7	53.7	12.2	15.4		3.8	7.0	11.1
Actuated g/C Ratio	0.11	0.58	0.58	0.06	0.54	0.54	0.12	0.15		0.04	0.07	0.11
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	200	2104	941	117	1938	867	220	484		68	252	179
v/s Ratio Prot	0.05	c0.51		c0.04	0.25		c0.06	c0.06		c0.03	0.01	
v/s Ratio Perm			0.01			0.02						0.01
v/c Ratio	0.45	0.88	0.01	0.69	0.47	0.04	0.47	0.36		0.71	0.08	0.06
Uniform Delay, d1	41.6	17.9	8.8	45.8	14.4	11.0	40.9	37.9		47.5	43.5	39.8
Progression Factor	1.00	1.00	1.00	1.25	0.64	0.36	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	5.7	0.0	12.9	0.8	0.1	0.6	0.8		23.7	0.2	0.1
Delay (s)	42.1	23.5	8.8	70.3	10.0	4.1	41.5	38.7		71.3	43.7	39.9
Level of Service	D	C	A	E	B	A	D	D		E	D	D
Approach Delay (s)		24.2			14.2			39.2			49.0	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



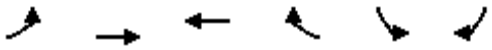
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	2117	204	43	817	12	61	32	20	38	77	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1805		1805	1900	1615
Flt Permitted	0.30	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	561	3610	1615	109	3610	1615		1805		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	53	2276	219	46	878	13	66	34	22	41	83	19
RTOR Reduction (vph)	0	0	10	0	0	4	0	10	0	0	0	17
Lane Group Flow (vph)	53	2276	209	46	878	9	0	112	0	41	83	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	69.5	69.5	69.5	69.5	69.5	69.5		11.5		8.5	8.5	8.5
Effective Green, g (s)	69.5	69.5	69.5	69.5	69.5	69.5		11.5		8.5	8.5	8.5
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70		0.12		0.08	0.08	0.08
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	389	2508	1122	75	2508	1122		207		153	161	137
v/s Ratio Prot		c0.63			0.24			c0.06		0.02	c0.04	
v/s Ratio Perm	0.09		0.13	0.42		0.01						0.00
v/c Ratio	0.14	0.91	0.19	0.61	0.35	0.01		0.54		0.27	0.52	0.01
Uniform Delay, d1	5.1	12.6	5.3	8.1	6.1	4.7		41.8		42.8	43.8	41.9
Progression Factor	1.56	1.13	1.57	0.99	0.64	0.35		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	4.6	0.3	31.5	0.4	0.0		2.9		0.9	2.8	0.0
Delay (s)	8.5	18.8	8.7	39.5	4.3	1.6		44.7		43.8	46.6	41.9
Level of Service	A	B	A	D	A	A		D		D	D	D
Approach Delay (s)		17.7			6.0			44.7			45.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1801	391	242	779	90	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1958	425	263	847	98	140
RTOR Reduction (vph)	0	39	0	0	0	128
Lane Group Flow (vph)	1958	386	263	847	98	12
Turn Type	NA	Perm	Prot	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	60.1	60.1	19.0	83.1	8.4	8.4
Effective Green, g (s)	60.1	60.1	19.0	83.1	8.4	8.4
Actuated g/C Ratio	0.60	0.60	0.19	0.83	0.08	0.08
Clearance Time (s)	4.5	4.5	4.0	4.5	4.0	4.0
Vehicle Extension (s)	4.5	4.5	3.0	4.5	3.0	3.0
Lane Grp Cap (vph)	2169	970	342	2999	294	135
v/s Ratio Prot	c0.54		c0.15	0.23	c0.03	
v/s Ratio Perm		0.24				0.01
v/c Ratio	0.90	0.40	0.77	0.28	0.33	0.09
Uniform Delay, d1	17.4	10.5	38.4	1.9	43.2	42.3
Progression Factor	1.09	1.49	0.88	1.07	1.00	1.00
Incremental Delay, d2	3.4	0.6	9.4	0.2	0.7	0.3
Delay (s)	22.4	16.2	43.1	2.2	43.8	42.5
Level of Service	C	B	D	A	D	D
Approach Delay (s)	21.3			11.9	43.1	
Approach LOS	C			B	D	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	43	1908	907	0	852	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.25	1.00	1.00		0.95	1.00
Satd. Flow (perm)	477	3610	3610		3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	2074	986	0	926	124
RTOR Reduction (vph)	0	0	0	0	0	75
Lane Group Flow (vph)	47	2074	986	0	926	49
Turn Type	Perm	NA	NA		NA	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	66.5	66.5	66.5		26.0	26.0
Effective Green, g (s)	66.5	66.5	66.5		26.0	26.0
Actuated g/C Ratio	0.66	0.66	0.66		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	317	2400	2400		910	419
v/s Ratio Prot		c0.57	0.27		c0.26	
v/s Ratio Perm	0.10					0.03
v/c Ratio	0.15	0.86	0.41		1.02	0.12
Uniform Delay, d1	6.2	13.2	7.7		37.0	28.2
Progression Factor	0.67	1.44	1.22		0.93	0.91
Incremental Delay, d2	0.5	2.2	0.5		33.6	0.1
Delay (s)	4.7	21.3	9.9		67.9	25.9
Level of Service	A	C	A		E	C
Approach Delay (s)		20.9	9.9		62.9	
Approach LOS		C	A		E	

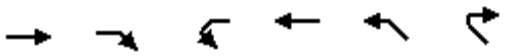
Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2340	396	72	1155	262	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	117	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	2516	426	77	1242	282	105
RTOR Reduction (vph)	0	35	0	0	0	4
Lane Group Flow (vph)	2516	391	77	1242	282	101
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	76	3371	945	436
v/s Ratio Prot	c0.70			0.24	c0.08	
v/s Ratio Perm		0.24	0.66			0.06
v/c Ratio	1.07	0.37	1.01	0.37	0.30	0.23
Uniform Delay, d1	17.5	8.1	17.5	8.1	29.0	28.4
Progression Factor	0.93	1.10	1.00	1.00	1.00	1.00
Incremental Delay, d2	36.9	0.4	106.9	0.3	0.8	1.2
Delay (s)	53.2	9.4	124.4	8.4	29.8	29.7
Level of Service	D	A	F	A	C	C
Approach Delay (s)	46.8			15.1	29.8	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

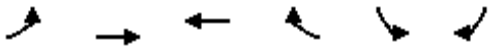
APPENDIX L

Interim Year (2016) With Project Conditions
Intersection Analysis Worksheets



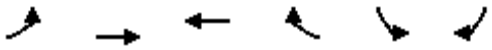
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	439	0	125	1313	1092	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	462	0	132	1382	1149	232
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	462	0	132	1382	1149	232
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	42.0		7.3	53.3	38.7	100.0
Effective Green, g (s)	42.0		7.3	53.3	38.7	100.0
Actuated g/C Ratio	0.42		0.07	0.53	0.39	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1516		255	1924	1355	1615
v/s Ratio Prot	0.13		0.04	c0.38	c0.33	
v/s Ratio Perm						0.14
v/c Ratio	0.30		0.52	0.72	0.85	0.14
Uniform Delay, d1	19.3		44.7	17.7	28.0	0.0
Progression Factor	1.00		1.45	0.43	1.00	1.00
Incremental Delay, d2	0.5		0.7	1.8	5.1	0.2
Delay (s)	19.8		65.7	9.3	33.1	0.2
Level of Service	B		E	A	C	A
Approach Delay (s)	19.8			14.2	27.6	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



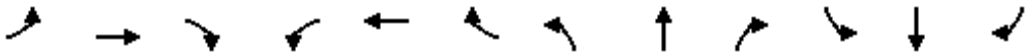
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	247	420	1292	566	105	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	287	488	1502	658	122	208
RTOR Reduction (vph)	0	0	0	234	0	189
Lane Group Flow (vph)	287	488	1502	424	122	19
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	80.2	59.2	59.2	9.3	9.3
Effective Green, g (s)	18.0	80.2	59.2	59.2	9.3	9.3
Actuated g/C Ratio	0.18	0.80	0.59	0.59	0.09	0.09
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2895	2137	956	325	150
v/s Ratio Prot	c0.16	0.14	c0.42		c0.03	
v/s Ratio Perm				0.26		0.01
v/c Ratio	0.89	0.17	0.70	0.44	0.38	0.13
Uniform Delay, d1	40.0	2.3	14.3	11.3	42.6	41.6
Progression Factor	0.73	1.62	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.0	0.1	2.0	1.5	0.7	0.4
Delay (s)	52.2	3.8	16.2	12.8	43.4	42.0
Level of Service	D	A	B	B	D	D
Approach Delay (s)		21.7	15.2		42.5	
Approach LOS		C	B		D	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	504	1396	0	610	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	579	1605	0	701	526
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	579	1605	0	701	526
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		30.5	30.5		19.9	60.0
Effective Green, g (s)		30.5	30.5		19.9	60.0
Actuated g/C Ratio		0.51	0.51		0.33	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2636	1835		598	1615
v/s Ratio Prot		0.11	c0.44		c0.39	
v/s Ratio Perm						0.33
v/c Ratio		0.22	0.87		1.17	0.33
Uniform Delay, d1		8.2	13.1		20.1	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	6.2		94.3	0.5
Delay (s)		8.4	19.2		114.4	0.5
Level of Service		A	B		F	A
Approach Delay (s)		8.4	19.2		65.6	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	770	80	0	1396	648	0	0	46	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	811	84	0	1469	682	0	0	48	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked				0.97			0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	1469			895			1545	2280	405	1923	2364	735
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1469			832			1502	2259	328	1891	2345	735
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	93	100	100	100
cM capacity (veh/h)	465			786			83	40	654	39	36	367

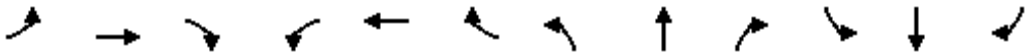
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	405	405	84	735	735	682	48
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	84	0	0	682	48
cSH	1700	1700	1700	1700	1700	1700	654
Volume to Capacity	0.24	0.24	0.05	0.43	0.43	0.40	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.9
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.9
Approach LOS							B

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	43.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	551	248	130	1874	202	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.43	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	819	3610	3502	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	586	264	138	1994	215	107
RTOR Reduction (vph)	0	53	0	0	0	95
Lane Group Flow (vph)	586	211	138	1994	215	12
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	80.1	80.1	80.1	80.1	11.4	11.4
Effective Green, g (s)	80.1	80.1	80.1	80.1	11.4	11.4
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.11	0.11
Clearance Time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	2891	1293	656	2891	399	184
v/s Ratio Prot	0.16			c0.55	c0.06	
v/s Ratio Perm		0.13	0.17			0.01
v/c Ratio	0.20	0.16	0.21	0.69	0.54	0.07
Uniform Delay, d1	2.4	2.3	2.4	4.4	41.8	39.5
Progression Factor	1.00	1.00	0.70	0.94	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.5	1.0	1.4	0.2
Delay (s)	2.5	2.6	2.2	5.1	43.2	39.7
Level of Service	A	A	A	A	D	D
Approach Delay (s)	2.5			5.0	42.1	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	186	10	124	271	11	3	2	110	3	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85			0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3582		1805	3589		1805	1620			1683	
Flt Permitted	0.56	1.00		0.62	1.00		0.75	1.00			0.92	
Satd. Flow (perm)	1073	3582		1175	3589		1423	1620			1573	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	202	11	135	295	12	3	2	120	3	0	10
RTOR Reduction (vph)	0	2	0	0	2	0	0	109	0	0	12	0
Lane Group Flow (vph)	15	211	0	135	305	0	3	13	0	0	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Effective Green, g (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	838	2799		918	2805		132	151			146	
v/s Ratio Prot		0.06			0.08			c0.01				
v/s Ratio Perm	0.01			c0.11			0.00				0.00	
v/c Ratio	0.02	0.08		0.15	0.11		0.02	0.09			0.01	
Uniform Delay, d1	1.5	1.5		1.6	1.6		24.7	24.9			24.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.3	0.1		0.1	0.3			0.0	
Delay (s)	1.5	1.6		2.0	1.6		24.8	25.1			24.7	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.6			1.7			25.1			24.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



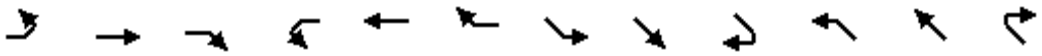
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	337	601	1015	1425	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	1.00	1.00
Adj. Flow (vph)	359	639	1080	1516	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	359	639	1080	1516	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.51	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	0.10		c0.60	c0.42		
v/s Ratio Perm		0.40				
v/c Ratio	0.33	0.40	1.16	0.46		
Uniform Delay, d1	16.3	0.0	14.6	0.4		
Progression Factor	1.00	1.00	0.79	1.00		
Incremental Delay, d2	0.2	0.7	84.0	0.1		
Delay (s)	16.6	0.7	95.4	0.6		
Level of Service	B	A	F	A		
Approach Delay (s)	6.4			40.0	0.0	
Approach LOS	A			D	A	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	838	0	0	625	0	337	0	0	1814	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	891	0	0	665	0	359	0	0	1930	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.74	0.74	0.93	0.74	0.74	0.70	0.70			0.93		
vC, conflicting volume	1988	2288	179	3001	2288	965	1930			359		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1201	1607	0	2570	1607	109	1479			157		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	12	100	100	0	100			100		
cM capacity (veh/h)	0	78	1014	1	78	655	325			1333		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	891	665	179	179	965	965
Volume Left	0	0	0	0	0	0
Volume Right	891	665	0	0	0	0
cSH	1014	655	1700	1700	1700	1700
Volume to Capacity	0.88	1.01	0.11	0.11	0.57	0.57
Queue Length 95th (ft)	304	410	0	0	0	0
Control Delay (s)	27.7	64.1	0.0	0.0	0.0	0.0
Lane LOS	D	F				
Approach Delay (s)	27.7	64.1	0.0		0.0	
Approach LOS	D	F				

Intersection Summary			
Average Delay	17.5		
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

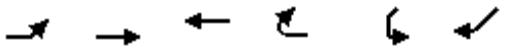


Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	838	0	0	625	0	337	0	0	1814	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	891	0	0	665	0	359	0	0	1930	0
RTOR Reduction (vph)	0	0	356	0	0	10	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	535	0	0	655	0	359	0	0	1930	0
Turn Type			Perm			Perm		NA			NA	
Protected Phases								6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			26.0			26.0		26.0			26.0	
Effective Green, g (s)			26.0			26.0		26.0			26.0	
Actuated g/C Ratio			0.43			0.43		0.43			0.43	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1231			712		1564			2247	
v/s Ratio Prot								0.10			c0.37	
v/s Ratio Perm			0.19			c0.40						
v/c Ratio			0.43			0.92		0.23			0.86	
Uniform Delay, d1			11.9			16.0		10.7			15.3	
Progression Factor			1.00			1.00		0.65			1.40	
Incremental Delay, d2			0.2			16.9		0.3			3.6	
Delay (s)			12.1			32.9		7.3			25.1	
Level of Service			B			C		A			C	
Approach Delay (s)		12.1			32.9			7.3			25.1	
Approach LOS		B			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1084	89	27	1698	117	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3610	1615	1805	3610	1763	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	3610	1615	1805	3610	1763	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1141	94	28	1787	123	51
RTOR Reduction (vph)	0	16	0	0	34	0
Lane Group Flow (vph)	1141	78	28	1787	140	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	38.6	38.6	2.0	43.6	8.9	
Effective Green, g (s)	38.6	38.6	2.0	43.6	8.9	
Actuated g/C Ratio	0.64	0.64	0.03	0.73	0.15	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2322	1038	60	2623	261	
v/s Ratio Prot	0.32		0.02	c0.50	c0.08	
v/s Ratio Perm		0.05				
v/c Ratio	0.49	0.08	0.47	0.68	0.54	
Uniform Delay, d1	5.6	4.0	28.5	4.4	23.6	
Progression Factor	0.81	0.58	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.1	2.1	1.5	2.1	
Delay (s)	5.3	2.5	30.6	5.9	25.8	
Level of Service	A	A	C	A	C	
Approach Delay (s)	5.1			6.3	25.8	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	78	1053	1621	34	10	104
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	81	1097	1689	35	10	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.57				0.65	0.57
vC, conflicting volume	1724				2399	844
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	766				975	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				92	83
cM capacity (veh/h)	489				137	623

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	81	548	548	844	844	35	119
Volume Left	81	0	0	0	0	0	10
Volume Right	0	0	0	0	0	35	108
cSH	489	1700	1700	1700	1700	1700	475
Volume to Capacity	0.17	0.32	0.32	0.50	0.50	0.02	0.25
Queue Length 95th (ft)	15	0	0	0	0	0	24
Control Delay (s)	13.8	0.0	0.0	0.0	0.0	0.0	15.1
Lane LOS	B						C
Approach Delay (s)	1.0			0.0			15.1
Approach LOS							C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

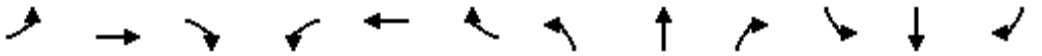


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	206	784	73	235	1435	49	28	47	167	54	72	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3187		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3187		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	229	871	81	261	1594	54	31	52	186	60	80	212
RTOR Reduction (vph)	0	0	37	0	0	29	0	169	0	0	0	158
Lane Group Flow (vph)	229	871	44	261	1594	25	31	69	0	60	80	54
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	25.6	53.8	53.8	17.2	45.4	45.4	2.9	9.0		4.0	10.1	25.6
Effective Green, g (s)	25.6	53.8	53.8	17.2	45.4	45.4	2.9	9.0		4.0	10.1	25.6
Actuated g/C Ratio	0.26	0.54	0.54	0.17	0.45	0.45	0.03	0.09		0.04	0.10	0.26
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	462	1942	868	310	1638	733	52	286		72	364	413
v/s Ratio Prot	c0.13	0.24		c0.14	c0.44		0.02	0.02		c0.03	c0.02	
v/s Ratio Perm			0.03			0.02						0.03
v/c Ratio	0.50	0.45	0.05	0.84	0.97	0.03	0.60	0.24		0.83	0.22	0.13
Uniform Delay, d1	31.7	14.1	11.0	40.1	26.7	15.1	48.0	42.3		47.7	41.3	28.6
Progression Factor	1.00	1.00	1.00	1.33	0.61	0.57	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.8	0.1	13.7	13.8	0.1	11.6	0.8		51.5	0.5	0.1
Delay (s)	32.0	14.8	11.1	66.8	30.2	8.7	59.6	43.1		99.1	41.9	28.7
Level of Service	C	B	B	E	C	A	E	D		F	D	C
Approach Delay (s)		17.9			34.6			45.0			43.7	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

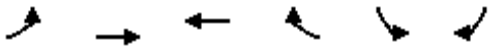
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	743	47	35	1655	21	28	87	28	8	24	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1832		1805	1900	1615
Flt Permitted	0.08	1.00	1.00	0.33	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (perm)	150	3610	1615	621	3610	1615		1832		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	14	799	51	38	1780	23	30	94	30	9	26	91
RTOR Reduction (vph)	0	0	10	0	0	7	0	10	0	0	0	85
Lane Group Flow (vph)	14	799	41	38	1780	16	0	144	0	9	26	6
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	70.3	70.3	70.3	70.3	70.3	70.3		13.1		6.1	6.1	6.1
Effective Green, g (s)	70.3	70.3	70.3	70.3	70.3	70.3		13.1		6.1	6.1	6.1
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70		0.13		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	105	2537	1135	436	2537	1135		239		110	115	98
v/s Ratio Prot		0.22			c0.49			c0.08		0.00	c0.01	
v/s Ratio Perm	0.09		0.03	0.06		0.01						0.00
v/c Ratio	0.13	0.31	0.04	0.09	0.70	0.01		0.60		0.08	0.23	0.06
Uniform Delay, d1	4.9	5.7	4.5	4.7	8.7	4.5		41.0		44.3	44.7	44.2
Progression Factor	1.53	1.29	1.78	1.06	0.67	1.61		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.4	0.3	0.1	0.3	1.2	0.0		4.2		0.3	1.0	0.2
Delay (s)	9.9	7.6	8.1	5.3	7.0	7.2		45.2		44.6	45.7	44.5
Level of Service	A	A	A	A	A	A		D		D	D	D
Approach Delay (s)		7.7			7.0			45.2			44.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	688	66	137	1529	43	226	10	185	12	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	3502	1630		1805	1661	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	3502	1630		1805	1661	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	748	72	149	1662	47	246	11	201	13	4	21
RTOR Reduction (vph)	0	0	33	0	0	17	0	177	0	0	20	0
Lane Group Flow (vph)	47	748	39	149	1662	30	246	35	0	13	5	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	7.2	54.8	54.8	15.8	63.4	63.4	9.0	12.1		0.8	3.9	
Effective Green, g (s)	7.2	54.8	54.8	15.8	63.4	63.4	9.0	12.1		0.8	3.9	
Actuated g/C Ratio	0.07	0.55	0.55	0.16	0.63	0.63	0.09	0.12		0.01	0.04	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	129	1978	885	285	2288	1023	315	197		14	64	
v/s Ratio Prot	0.03	c0.21		0.08	c0.46		c0.07	c0.02		0.01	0.00	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	0.36	0.38	0.04	0.52	0.73	0.03	0.78	0.18		0.93	0.08	
Uniform Delay, d1	44.2	12.9	10.5	38.6	12.4	6.8	44.5	39.5		49.6	46.3	
Progression Factor	1.07	1.02	1.00	0.81	0.51	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.5	0.1	1.5	1.7	0.0	11.9	0.4		201.0	0.5	
Delay (s)	48.8	13.7	10.6	32.8	8.1	6.9	56.4	39.9		250.5	46.8	
Level of Service	D	B	B	C	A	A	E	D		F	D	
Approach Delay (s)		15.4			10.0			48.8			116.5	
Approach LOS		B			B			D			F	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	84	754	1613	0	333	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.11	1.00	1.00		0.95	1.00
Satd. Flow (perm)	218	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	87	777	1663	0	343	100
RTOR Reduction (vph)	0	0	0	0	0	31
Lane Group Flow (vph)	87	777	1663	0	343	69
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	77.4	77.4	77.4		15.1	15.1
Effective Green, g (s)	77.4	77.4	77.4		15.1	15.1
Actuated g/C Ratio	0.77	0.77	0.77		0.15	0.15
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	168	2794	2794		528	243
v/s Ratio Prot		0.22	c0.46		c0.10	
v/s Ratio Perm	0.40					0.04
v/c Ratio	0.52	0.28	0.60		0.65	0.28
Uniform Delay, d1	4.3	3.3	4.7		40.0	37.6
Progression Factor	1.59	1.12	0.66		0.92	0.94
Incremental Delay, d2	10.4	0.2	0.5		2.7	0.6
Delay (s)	17.2	3.9	3.7		39.6	35.9
Level of Service	B	A	A		D	D
Approach Delay (s)		5.2	3.7		38.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	972	174	82	2656	631	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.23	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	429	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1045	187	88	2856	678	84
RTOR Reduction (vph)	0	37	0	0	0	26
Lane Group Flow (vph)	1045	150	88	2856	678	58
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	278	3371	945	436
v/s Ratio Prot	0.29			c0.55	c0.19	
v/s Ratio Perm		0.09	0.20			0.04
v/c Ratio	0.45	0.14	0.32	0.85	0.72	0.13
Uniform Delay, d1	8.6	6.8	7.7	13.6	33.0	27.6
Progression Factor	0.34	0.30	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.3	3.0	2.8	4.7	0.6
Delay (s)	3.5	2.3	10.7	16.5	37.7	28.3
Level of Service	A	A	B	B	D	C
Approach Delay (s)	3.4			16.3	36.7	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	417	170	10	1748	255	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	439	179	11	1840	268	13
RTOR Reduction (vph)	0	58	0	0	0	10
Lane Group Flow (vph)	439	121	11	1840	268	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4
Actuated Green, G (s)	67.8	67.8	0.8	72.6	19.4	19.4
Effective Green, g (s)	67.8	67.8	0.8	72.6	19.4	19.4
Actuated g/C Ratio	0.68	0.68	0.01	0.73	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2447	1094	14	2620	350	313
v/s Ratio Prot	0.12		0.01	c0.51	c0.15	
v/s Ratio Perm		0.08				0.00
v/c Ratio	0.18	0.11	0.79	0.70	0.77	0.01
Uniform Delay, d1	5.9	5.6	49.5	7.7	38.1	32.5
Progression Factor	0.88	0.39	0.99	1.21	1.00	1.00
Incremental Delay, d2	0.2	0.2	89.7	0.9	9.6	0.0
Delay (s)	5.3	2.4	138.8	10.1	47.8	32.5
Level of Service	A	A	F	B	D	C
Approach Delay (s)	4.5			10.9	47.1	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

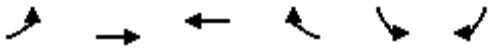
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	585	66	4	1999	5	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	616	69	4	2104	5	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	350			324		
pX, platoon unblocked			0.97		0.70	0.97
vC, conflicting volume			685		1676	308
vC1, stage 1 conf vol					616	
vC2, stage 2 conf vol					1061	
vCu, unblocked vol			617		930	228
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			945		421	758

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NE 1
Volume Total	308	308	69	706	1403	7
Volume Left	0	0	0	4	0	5
Volume Right	0	0	69	0	0	2
cSH	1700	1700	1700	945	1700	483
Volume to Capacity	0.18	0.18	0.04	0.00	0.83	0.02
Queue Length 95th (ft)	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.1	0.0	12.6
Lane LOS				A		B
Approach Delay (s)	0.0			0.0		12.6
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

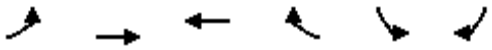
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	655	0	201	539	839	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	682	0	209	561	874	115
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	682	0	209	561	874	115
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	45.7		10.7	60.4	31.6	100.0
Effective Green, g (s)	45.7		10.7	60.4	31.6	100.0
Actuated g/C Ratio	0.46		0.11	0.60	0.32	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1649		374	2180	1106	1615
v/s Ratio Prot	c0.19		c0.06	0.16	c0.25	
v/s Ratio Perm						0.07
v/c Ratio	0.41		0.56	0.26	0.79	0.07
Uniform Delay, d1	18.2		42.4	9.3	31.2	0.0
Progression Factor	1.00		1.31	0.62	1.00	1.00
Incremental Delay, d2	0.8		1.1	0.3	3.9	0.1
Delay (s)	18.9		56.9	6.0	35.1	0.1
Level of Service	B		E	A	D	A
Approach Delay (s)	18.9			19.8	31.0	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



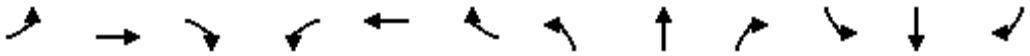
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	215	575	474	176	369	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	259	693	571	212	445	278
RTOR Reduction (vph)	0	0	0	106	0	227
Lane Group Flow (vph)	259	693	571	106	445	51
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	71.2	50.2	50.2	18.3	18.3
Effective Green, g (s)	18.0	71.2	50.2	50.2	18.3	18.3
Actuated g/C Ratio	0.18	0.71	0.50	0.50	0.18	0.18
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2570	1812	810	640	295
v/s Ratio Prot	c0.14	0.19	c0.16		c0.13	
v/s Ratio Perm				0.07		0.03
v/c Ratio	0.80	0.27	0.32	0.13	0.70	0.17
Uniform Delay, d1	39.3	5.1	14.7	13.3	38.2	34.5
Progression Factor	0.79	1.62	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.8	0.3	0.5	0.3	3.3	0.3
Delay (s)	43.0	8.5	15.2	13.6	41.5	34.7
Level of Service	D	A	B	B	D	C
Approach Delay (s)		17.9	14.8		38.9	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	933	409	0	475	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	1060	465	0	540	277
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1060	465	0	540	277
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		30.9	30.9		19.5	60.0
Effective Green, g (s)		30.9	30.9		19.5	60.0
Actuated g/C Ratio		0.51	0.51		0.32	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2671	1859		586	1615
v/s Ratio Prot		c0.20	0.13		c0.30	
v/s Ratio Perm						0.17
v/c Ratio		0.40	0.25		0.92	0.17
Uniform Delay, d1		8.9	8.1		19.5	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.4	0.3		20.1	0.2
Delay (s)		9.3	8.4		39.6	0.2
Level of Service		A	A		D	A
Approach Delay (s)		9.3	8.4		26.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1240	35	0	409	503	0	0	26	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	1305	37	0	431	529	0	0	27	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked				0.86			0.86	0.86	0.86	0.86	0.86	
vC, conflicting volume	431			1342			1521	1736	653	1111	1773	215
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	431			1070			1277	1528	267	800	1571	215
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	96	100	100	100
cM capacity (veh/h)	1140			566			108	102	633	230	96	796

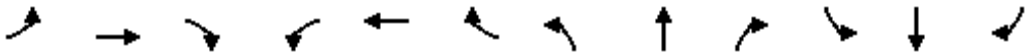
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	653	653	37	215	215	529	27
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	37	0	0	529	27
cSH	1700	1700	1700	1700	1700	1700	633
Volume to Capacity	0.38	0.38	0.02	0.13	0.13	0.31	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.9
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.9
Approach LOS							B

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	44.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1107	177	108	701	192	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.22	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	409	3610	3502	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1216	195	119	770	211	149
RTOR Reduction (vph)	0	39	0	0	0	106
Lane Group Flow (vph)	1216	156	119	770	211	43
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	80.2	80.2	80.2	80.2	11.3	11.3
Effective Green, g (s)	80.2	80.2	80.2	80.2	11.3	11.3
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.11	0.11
Clearance Time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	2895	1295	328	2895	395	182
v/s Ratio Prot	c0.34			0.21	c0.06	
v/s Ratio Perm		0.10	0.29			0.03
v/c Ratio	0.42	0.12	0.36	0.27	0.53	0.24
Uniform Delay, d1	3.0	2.2	2.8	2.5	41.9	40.4
Progression Factor	1.00	1.00	1.53	1.31	1.00	1.00
Incremental Delay, d2	0.4	0.2	3.0	0.2	1.4	0.7
Delay (s)	3.4	2.4	7.3	3.5	43.3	41.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	3.3			4.0	42.4	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	226	17	94	163	3	7	0	88	7	11	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3572		1805	3599		1805	1615			1730	
Flt Permitted	0.62	1.00		0.57	1.00		0.89	1.00			0.94	
Satd. Flow (perm)	1184	3572		1081	3599		1687	1615			1641	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	9	279	21	116	201	4	9	0	109	9	14	36
RTOR Reduction (vph)	0	4	0	0	1	0	0	99	0	0	33	0
Lane Group Flow (vph)	9	296	0	116	204	0	9	10	0	0	26	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Effective Green, g (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	925	2792		844	2813		157	150			153	
v/s Ratio Prot		0.08			0.06			0.01				
v/s Ratio Perm	0.01			c0.11			0.01				c0.02	
v/c Ratio	0.01	0.11		0.14	0.07		0.06	0.07			0.17	
Uniform Delay, d1	1.4	1.6		1.6	1.5		24.8	24.8			25.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.3	0.1		0.2	0.2			0.5	
Delay (s)	1.5	1.6		1.9	1.6		24.9	25.0			25.6	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.6			1.7			25.0			25.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



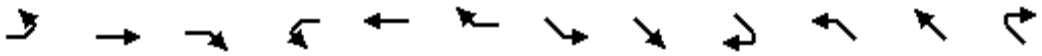
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	997	1003	817	968	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	1.00	1.00
Adj. Flow (vph)	1049	1056	860	1019	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1049	1056	860	1019	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.51	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	c0.29		c0.48	0.28		
v/s Ratio Perm		0.65				
v/c Ratio	0.97	0.65	0.93	0.31		
Uniform Delay, d1	20.7	0.0	13.5	0.4		
Progression Factor	1.00	1.00	0.96	1.00		
Incremental Delay, d2	20.0	2.1	16.1	0.1		
Delay (s)	40.7	2.1	29.0	0.4		
Level of Service	D	A	C	A		
Approach Delay (s)	21.3			13.5	0.0	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	916	0	0	594	0	997	0	0	1190	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	944	0	0	612	0	1028	0	0	1227	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.76	0.76	0.72	0.76	0.76	0.92	0.92			0.72		
vC, conflicting volume	2254	2255	514	2685	2255	613	1227			1028		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1520	1522	0	2089	1522	396	1065			249		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	0	0	100	0	100			100		
cM capacity (veh/h)	0	91	782	0	91	558	607			953		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	944	612	514	514	613	613
Volume Left	0	0	0	0	0	0
Volume Right	944	612	0	0	0	0
cSH	782	558	1700	1700	1700	1700
Volume to Capacity	1.21	1.10	0.30	0.30	0.36	0.36
Queue Length 95th (ft)	788	473	0	0	0	0
Control Delay (s)	124.8	93.7	0.0	0.0	0.0	0.0
Lane LOS	F	F				
Approach Delay (s)	124.8	93.7	0.0		0.0	
Approach LOS	F	F				

Intersection Summary				
Average Delay	46.0			
Intersection Capacity Utilization	90.9%	ICU Level of Service	E	
Analysis Period (min)	15			

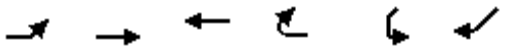


Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	916	0	0	594	0	997	0	0	1190	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	944	0	0	612	0	1028	0	0	1227	0
RTOR Reduction (vph)	0	0	29	0	0	10	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	915	0	0	602	0	1028	0	0	1227	0
Turn Type			Perm			Perm		NA			NA	
Protected Phases								6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			25.8			25.8		26.2			26.2	
Effective Green, g (s)			25.8			25.8		26.2			26.2	
Actuated g/C Ratio			0.43			0.43		0.44			0.44	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1222			706		1576			2264	
v/s Ratio Prot								c0.28			0.24	
v/s Ratio Perm			0.32			c0.37						
v/c Ratio			0.75			0.85		0.65			0.54	
Uniform Delay, d1			14.4			15.4		13.3			12.5	
Progression Factor			1.00			1.00		2.27			1.18	
Incremental Delay, d2			2.6			9.8		0.6			0.9	
Delay (s)			16.9			25.1		30.8			15.6	
Level of Service			B			C		C			B	
Approach Delay (s)		16.9			25.1			30.8			15.6	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1893	20	0	1183	7	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	3.0	
Lane Util. Factor	0.95	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	0.90	
Flt Protected	1.00	1.00		1.00	0.99	
Satd. Flow (prot)	3610	1615		3610	1694	
Flt Permitted	1.00	1.00		1.00	0.99	
Satd. Flow (perm)	3610	1615		3610	1694	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1993	21	0	1245	7	17
RTOR Reduction (vph)	0	1	0	0	17	0
Lane Group Flow (vph)	1993	20	0	1245	7	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	51.0	51.0		51.0	1.5	
Effective Green, g (s)	51.0	51.0		51.0	1.5	
Actuated g/C Ratio	0.85	0.85		0.85	0.02	
Clearance Time (s)	4.5	4.5		4.5	3.0	
Vehicle Extension (s)	3.5	3.5		4.5	3.0	
Lane Grp Cap (vph)	3068	1372		3068	42	
v/s Ratio Prot	c0.55			0.34	c0.00	
v/s Ratio Perm		0.01				
v/c Ratio	0.65	0.01		0.41	0.18	
Uniform Delay, d1	1.5	0.7		1.0	28.6	
Progression Factor	1.64	0.44		1.00	1.00	
Incremental Delay, d2	1.0	0.0		0.4	2.0	
Delay (s)	3.4	0.3		1.4	30.7	
Level of Service	A	A		A	C	
Approach Delay (s)	3.4			1.4	30.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	31	1878	1129	10	16	55
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	2041	1227	11	17	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.80				0.78	0.80
vC, conflicting volume	1238				2315	614
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	786				935	2
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				91	93
cM capacity (veh/h)	670				197	866

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	34	1021	1021	614	614	11	77
Volume Left	34	0	0	0	0	0	17
Volume Right	0	0	0	0	0	11	60
cSH	670	1700	1700	1700	1700	1700	491
Volume to Capacity	0.05	0.60	0.60	0.36	0.36	0.01	0.16
Queue Length 95th (ft)	4	0	0	0	0	0	14
Control Delay (s)	10.7	0.0	0.0	0.0	0.0	0.0	13.7
Lane LOS	B						B
Approach Delay (s)	0.2			0.0			13.7
Approach LOS							B

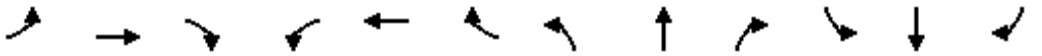
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	193	1685	18	76	851	60	94	71	397	43	21	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3151		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3151		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	214	1872	20	84	946	67	104	79	441	48	23	216
RTOR Reduction (vph)	0	0	8	0	0	38	0	338	0	0	0	169
Lane Group Flow (vph)	214	1872	12	84	946	29	104	182	0	48	23	47
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	21.9	57.9	57.9	6.7	42.7	42.7	12.3	15.6		3.8	7.1	21.9
Effective Green, g (s)	21.9	57.9	57.9	6.7	42.7	42.7	12.3	15.6		3.8	7.1	21.9
Actuated g/C Ratio	0.22	0.58	0.58	0.07	0.43	0.43	0.12	0.16		0.04	0.07	0.22
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	395	2090	935	120	1541	689	222	491		68	256	353
v/s Ratio Prot	0.12	c0.52		c0.05	0.26		c0.06	c0.06		c0.03	0.01	
v/s Ratio Perm			0.01			0.02						0.03
v/c Ratio	0.54	0.90	0.01	0.70	0.61	0.04	0.47	0.37		0.71	0.09	0.13
Uniform Delay, d1	34.6	18.4	8.9	45.7	22.2	16.7	40.8	37.8		47.5	43.4	31.4
Progression Factor	1.00	1.00	1.00	1.25	0.66	0.63	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	6.5	0.0	13.0	1.8	0.1	0.6	0.8		23.7	0.3	0.1
Delay (s)	35.4	24.9	9.0	70.2	16.4	10.6	41.4	38.6		71.3	43.7	31.5
Level of Service	D	C	A	E	B	B	D	D		E	D	C
Approach Delay (s)		25.8			20.2			39.1			39.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

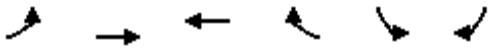
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	2137	204	46	843	18	61	34	23	38	79	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1803		1805	1900	1615
Flt Permitted	0.28	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	540	3610	1615	110	3610	1615		1803		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	53	2298	219	49	906	19	66	37	25	41	85	19
RTOR Reduction (vph)	0	0	10	0	0	6	0	11	0	0	0	17
Lane Group Flow (vph)	53	2298	209	49	906	13	0	117	0	41	85	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	69.1	69.1	69.1	69.1	69.1	69.1		11.8		8.6	8.6	8.6
Effective Green, g (s)	69.1	69.1	69.1	69.1	69.1	69.1		11.8		8.6	8.6	8.6
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.69		0.12		0.09	0.09	0.09
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	373	2494	1115	76	2494	1115		212		155	163	138
v/s Ratio Prot		c0.64			0.25			c0.07		0.02	c0.04	
v/s Ratio Perm	0.10		0.13	0.45		0.01						0.00
v/c Ratio	0.14	0.92	0.19	0.64	0.36	0.01		0.55		0.26	0.52	0.01
Uniform Delay, d1	5.3	13.1	5.5	8.6	6.4	4.8		41.6		42.7	43.7	41.8
Progression Factor	1.57	1.14	1.58	0.82	0.62	0.39		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	5.2	0.3	33.9	0.4	0.0		3.1		0.9	3.0	0.0
Delay (s)	8.9	20.2	8.9	41.0	4.3	1.9		44.7		43.7	46.7	41.8
Level of Service	A	C	A	D	A	A		D		D	D	D
Approach Delay (s)		19.0			6.1			44.7			45.2	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1801	391	245	779	23	90	5	132	23	7	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	3502	1625		1805	1664	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	3502	1625		1805	1664	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	1958	425	266	847	25	98	5	143	25	8	39
RTOR Reduction (vph)	0	0	45	0	0	8	0	130	0	0	37	0
Lane Group Flow (vph)	25	1958	380	266	847	17	98	18	0	25	10	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	3.3	56.5	56.5	16.4	69.6	69.6	4.6	9.0		1.6	6.0	
Effective Green, g (s)	3.3	56.5	56.5	16.4	69.6	69.6	4.6	9.0		1.6	6.0	
Actuated g/C Ratio	0.03	0.56	0.56	0.16	0.70	0.70	0.05	0.09		0.02	0.06	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	59	2039	912	296	2512	1124	161	146		28	99	
v/s Ratio Prot	0.01	c0.54		c0.15	0.23		c0.03	c0.01		0.01	0.01	
v/s Ratio Perm			0.24			0.01						
v/c Ratio	0.42	0.96	0.42	0.90	0.34	0.02	0.61	0.12		0.89	0.10	
Uniform Delay, d1	47.4	20.7	12.4	41.0	6.0	4.7	46.8	41.9		49.1	44.5	
Progression Factor	0.94	1.11	1.48	0.83	0.62	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	7.0	0.6	26.3	0.3	0.0	6.4	0.4		123.8	0.5	
Delay (s)	46.9	29.9	18.9	60.4	4.1	4.7	53.2	42.2		172.9	44.9	
Level of Service	D	C	B	E	A	A	D	D		F	D	
Approach Delay (s)		28.1			17.3			46.6			89.4	
Approach LOS		C			B			D			F	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	59	1918	915	0	866	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.25	1.00	1.00		0.95	1.00
Satd. Flow (perm)	471	3610	3610		3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	2085	995	0	941	145
RTOR Reduction (vph)	0	0	0	0	0	86
Lane Group Flow (vph)	64	2085	995	0	941	59
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	66.5	66.5	66.5		26.0	26.0
Effective Green, g (s)	66.5	66.5	66.5		26.0	26.0
Actuated g/C Ratio	0.66	0.66	0.66		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	313	2400	2400		910	419
v/s Ratio Prot		c0.58	0.28		c0.27	
v/s Ratio Perm	0.14					0.04
v/c Ratio	0.20	0.87	0.41		1.03	0.14
Uniform Delay, d1	6.5	13.3	7.7		37.0	28.4
Progression Factor	0.66	1.44	1.22		0.82	1.02
Incremental Delay, d2	0.8	2.5	0.5		37.9	0.1
Delay (s)	5.0	21.6	9.9		68.4	29.1
Level of Service	A	C	A		E	C
Approach Delay (s)		21.1	9.9		63.2	
Approach LOS		C	A		E	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2358	402	72	1174	267	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	117	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	2535	432	77	1262	287	105
RTOR Reduction (vph)	0	35	0	0	0	4
Lane Group Flow (vph)	2535	397	77	1262	287	101
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	76	3371	945	436
v/s Ratio Prot	c0.70			0.24	c0.08	
v/s Ratio Perm		0.25	0.66			0.06
v/c Ratio	1.08	0.38	1.01	0.37	0.30	0.23
Uniform Delay, d1	17.5	8.1	17.5	8.1	29.0	28.4
Progression Factor	0.93	1.09	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.1	0.4	106.9	0.3	0.8	1.2
Delay (s)	56.3	9.3	124.4	8.4	29.9	29.7
Level of Service	E	A	F	A	C	C
Approach Delay (s)	49.5			15.1	29.8	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	987	219	15	572	235	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1039	231	16	602	247	14
RTOR Reduction (vph)	0	79	0	0	0	11
Lane Group Flow (vph)	1039	152	16	602	247	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4
Actuated Green, G (s)	66.0	66.0	3.0	73.0	19.0	19.0
Effective Green, g (s)	66.0	66.0	3.0	73.0	19.0	19.0
Actuated g/C Ratio	0.66	0.66	0.03	0.73	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2382	1065	54	2635	342	306
v/s Ratio Prot	c0.29		0.01	c0.17	c0.14	
v/s Ratio Perm		0.09				0.00
v/c Ratio	0.44	0.14	0.30	0.23	0.72	0.01
Uniform Delay, d1	8.1	6.4	47.5	4.4	38.0	32.9
Progression Factor	0.85	0.48	0.99	0.98	1.00	1.00
Incremental Delay, d2	0.5	0.3	2.9	0.2	7.3	0.0
Delay (s)	7.5	3.3	49.8	4.5	45.4	32.9
Level of Service	A	A	D	A	D	C
Approach Delay (s)	6.7			5.6	44.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

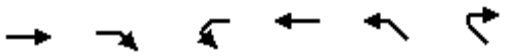
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	1204	40	4	803	6	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1267	42	4	845	6	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	350			324		
pX, platoon unblocked			0.90		0.93	0.90
vC, conflicting volume			1309		1698	634
vC1, stage 1 conf vol					1267	
vC2, stage 2 conf vol					431	
vCu, unblocked vol			1120		1339	368
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	100
cM capacity (veh/h)			568		253	571

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NE 1
Volume Total	634	634	42	286	564	8
Volume Left	0	0	0	4	0	6
Volume Right	0	0	42	0	0	2
cSH	1700	1700	1700	568	1700	294
Volume to Capacity	0.37	0.37	0.02	0.01	0.33	0.03
Queue Length 95th (ft)	0	0	0	1	0	2
Control Delay (s)	0.0	0.0	0.0	0.3	0.0	17.6
Lane LOS				A		C
Approach Delay (s)	0.0			0.1		17.6
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

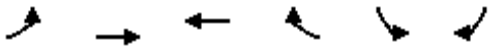
APPENDIX M

Long Range (2035) Without Project Conditions
Intersection Analysis Worksheets



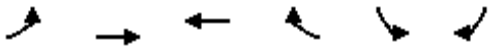
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	448	0	131	1358	1136	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	472	0	138	1429	1196	242
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	472	0	138	1429	1196	242
Turn Type	NA		Prot	NA	NA	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	41.1		7.2	52.3	39.7	100.0
Effective Green, g (s)	41.1		7.2	52.3	39.7	100.0
Actuated g/C Ratio	0.41		0.07	0.52	0.40	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1483		252	1888	1390	1615
v/s Ratio Prot	0.13		0.04	c0.40	c0.34	
v/s Ratio Perm						0.15
v/c Ratio	0.32		0.55	0.76	0.86	0.15
Uniform Delay, d1	20.0		44.8	18.8	27.6	0.0
Progression Factor	1.00		1.44	0.45	1.00	1.00
Incremental Delay, d2	0.6		1.1	2.1	5.7	0.2
Delay (s)	20.5		65.8	10.5	33.3	0.2
Level of Service	C		E	B	C	A
Approach Delay (s)	20.5			15.4	27.7	
Approach LOS	C			B	C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	258	428	1336	589	108	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	300	498	1553	685	126	217
RTOR Reduction (vph)	0	0	0	236	0	197
Lane Group Flow (vph)	300	498	1553	449	126	20
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	80.1	59.1	59.1	9.4	9.4
Effective Green, g (s)	18.0	80.1	59.1	59.1	9.4	9.4
Actuated g/C Ratio	0.18	0.80	0.59	0.59	0.09	0.09
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2891	2133	954	329	151
v/s Ratio Prot	c0.17	0.14	c0.43		c0.04	
v/s Ratio Perm				0.28		0.01
v/c Ratio	0.93	0.17	0.73	0.47	0.38	0.14
Uniform Delay, d1	40.3	2.3	14.7	11.6	42.6	41.6
Progression Factor	0.73	1.67	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.5	0.1	2.2	1.7	0.7	0.4
Delay (s)	60.0	4.0	16.9	13.3	43.3	42.0
Level of Service	E	A	B	B	D	D
Approach Delay (s)		25.0	15.8		42.5	
Approach LOS		C	B		D	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	514	1445	0	471	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	591	1661	0	541	549
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	591	1661	0	541	549
Turn Type		NA	NA		NA	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		30.9	30.9		19.5	60.0
Effective Green, g (s)		30.9	30.9		19.5	60.0
Actuated g/C Ratio		0.51	0.51		0.32	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2671	1859		586	1615
v/s Ratio Prot		0.11	c0.46		c0.30	
v/s Ratio Perm						0.34
v/c Ratio		0.22	0.89		0.92	0.34
Uniform Delay, d1		8.0	13.1		19.5	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	7.1		20.3	0.6
Delay (s)		8.2	20.1		39.8	0.6
Level of Service		A	C		D	A
Approach Delay (s)		8.2	20.1		20.1	
Approach LOS		A	C		C	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	626	84	0	1445	518	0	0	48	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	659	88	0	1521	545	0	0	51	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked												
vC, conflicting volume	1521			747			1419	2180	329	1901	2268	761
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1521			747			1419	2180	329	1901	2268	761
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	92	100	100	100
cM capacity (veh/h)	444			870			99	47	672	40	41	353

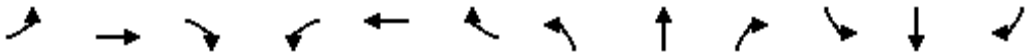
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	329	329	88	761	761	545	51
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	88	0	0	545	51
cSH	1700	1700	1700	1700	1700	1700	672
Volume to Capacity	0.19	0.19	0.05	0.45	0.45	0.32	0.08
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.8
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.8
Approach LOS							B

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	43.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	398	257	21	1789	207	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.51	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	960	3610	3502	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	423	273	22	1903	220	1
RTOR Reduction (vph)	0	55	0	0	0	1
Lane Group Flow (vph)	423	218	22	1903	220	0
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	79.9	79.9	79.9	79.9	11.6	11.6
Effective Green, g (s)	79.9	79.9	79.9	79.9	11.6	11.6
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.12	0.12
Clearance Time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	2884	1290	767	2884	406	187
v/s Ratio Prot	0.12			c0.53	c0.06	
v/s Ratio Perm		0.14	0.02			0.00
v/c Ratio	0.15	0.17	0.03	0.66	0.54	0.00
Uniform Delay, d1	2.3	2.3	2.1	4.3	41.7	39.1
Progression Factor	1.00	1.00	1.30	1.03	1.00	1.00
Incremental Delay, d2	0.1	0.3	0.0	0.6	1.5	0.0
Delay (s)	2.4	2.6	2.7	5.0	43.2	39.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	2.5			5.0	43.2	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	92	10	127	169	10	3	2	109	2	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85			0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3556		1805	3579		1805	1620			1672	
Flt Permitted	0.63	1.00		0.68	1.00		0.75	1.00			0.95	
Satd. Flow (perm)	1195	3556		1295	3579		1424	1620			1595	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	100	11	138	184	11	3	2	118	2	0	10
RTOR Reduction (vph)	0	2	0	0	2	0	0	107	0	0	11	0
Lane Group Flow (vph)	16	109	0	138	193	0	3	13	0	0	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Effective Green, g (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	934	2779		1012	2797		132	151			148	
v/s Ratio Prot		0.03			0.05			c0.01				
v/s Ratio Perm	0.01			c0.11			0.00				0.00	
v/c Ratio	0.02	0.04		0.14	0.07		0.02	0.09			0.01	
Uniform Delay, d1	1.4	1.5		1.6	1.5		24.7	24.9			24.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.0		0.3	0.0		0.1	0.2			0.0	
Delay (s)	1.5	1.5		1.9	1.6		24.8	25.1			24.7	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.5			1.7			25.1			24.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



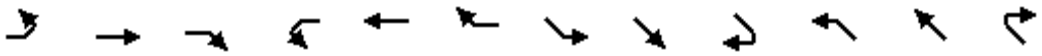
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	344	627	938	1483	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	1.00	1.00
Adj. Flow (vph)	366	667	998	1578	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	366	667	998	1578	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.51	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	0.10		c0.55	c0.44		
v/s Ratio Perm		0.41				
v/c Ratio	0.34	0.41	1.07	0.48		
Uniform Delay, d1	16.4	0.0	14.6	0.4		
Progression Factor	1.00	1.00	0.77	1.00		
Incremental Delay, d2	0.3	0.8	50.2	0.1		
Delay (s)	16.6	0.8	61.4	0.6		
Level of Service	B	A	E	A		
Approach Delay (s)	6.4			24.1	0.0	
Approach LOS	A			C	A	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	745	0	0	653	0	344	0	0	1768	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	793	0	0	695	0	366	0	0	1881	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.73	0.73	0.93	0.73	0.73	0.70	0.70			0.93		
vC, conflicting volume	2001	2247	183	2856	2247	940	1881			366		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1213	1548	0	2380	1548	51	1398			170		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	22	100	100	2	100			100		
cM capacity (veh/h)	2	84	1015	3	84	707	346			1321		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	793	695	183	183	940	940
Volume Left	0	0	0	0	0	0
Volume Right	793	695	0	0	0	0
cSH	1015	707	1700	1700	1700	1700
Volume to Capacity	0.78	0.98	0.11	0.11	0.55	0.55
Queue Length 95th (ft)	206	385	0	0	0	0
Control Delay (s)	19.9	53.8	0.0	0.0	0.0	0.0
Lane LOS	C	F				
Approach Delay (s)	19.9	53.8	0.0		0.0	
Approach LOS	C	F				

Intersection Summary				
Average Delay	14.2			
Intersection Capacity Utilization	96.0%	ICU Level of Service		F
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	745	0	0	653	0	344	0	0	1768	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	793	0	0	695	0	366	0	0	1881	0
RTOR Reduction (vph)	0	0	345	0	0	10	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	448	0	0	685	0	366	0	0	1881	0
Turn Type			custom			custom		NA			NA	
Protected Phases								6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			26.4			26.4		25.6			25.6	
Effective Green, g (s)			26.4			26.4		25.6			25.6	
Actuated g/C Ratio			0.44			0.44		0.43			0.43	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1250			723		1540			2213	
v/s Ratio Prot								0.10			c0.36	
v/s Ratio Perm			0.16			c0.42						
v/c Ratio			0.36			0.95		0.24			0.85	
Uniform Delay, d1			11.2			16.1		11.0			15.5	
Progression Factor			1.00			1.00		0.66			1.40	
Incremental Delay, d2			0.2			21.3		0.3			3.3	
Delay (s)			11.3			37.4		7.6			25.0	
Level of Service			B			D		A			C	
Approach Delay (s)		11.3			37.4			7.6			25.0	
Approach LOS		B			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	994	93	28	1647	122	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3610	1615	1805	3610	1763	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	3610	1615	1805	3610	1763	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1046	98	29	1734	128	53
RTOR Reduction (vph)	0	19	0	0	33	0
Lane Group Flow (vph)	1046	79	29	1734	148	0
Turn Type	NA	Perm	Prot	NA	NA	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	37.3	37.3	2.0	42.3	10.2	
Effective Green, g (s)	37.3	37.3	2.0	42.3	10.2	
Actuated g/C Ratio	0.62	0.62	0.03	0.70	0.17	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2244	1003	60	2545	299	
v/s Ratio Prot	0.29		0.02	c0.48	c0.08	
v/s Ratio Perm		0.05				
v/c Ratio	0.47	0.08	0.48	0.68	0.49	
Uniform Delay, d1	6.0	4.5	28.5	5.0	22.6	
Progression Factor	0.77	0.53	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.2	2.2	1.5	1.3	
Delay (s)	5.4	2.5	30.7	6.5	23.9	
Level of Service	A	A	C	A	C	
Approach Delay (s)	5.1			6.9	23.9	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	82	963	1567	36	10	108
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	85	1003	1632	38	10	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.61				0.68	0.61
vC, conflicting volume	1670				2305	816
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	804				1016	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				92	83
cM capacity (veh/h)	502				134	661

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	85	502	502	816	816	38	123
Volume Left	85	0	0	0	0	0	10
Volume Right	0	0	0	0	0	38	112
cSH	502	1700	1700	1700	1700	1700	495
Volume to Capacity	0.17	0.30	0.30	0.48	0.48	0.02	0.25
Queue Length 95th (ft)	15	0	0	0	0	0	24
Control Delay (s)	13.6	0.0	0.0	0.0	0.0	0.0	14.6
Lane LOS	B						B
Approach Delay (s)	1.1			0.0			14.6
Approach LOS							B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	114	782	76	243	1484	49	29	47	169	54	72	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3186		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3186		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	127	869	84	270	1649	54	32	52	188	60	80	98
RTOR Reduction (vph)	0	0	39	0	0	24	0	171	0	0	0	82
Lane Group Flow (vph)	127	869	45	270	1649	30	32	69	0	60	80	16
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	16.2	53.1	53.1	17.8	54.7	54.7	2.9	9.1		4.0	10.2	16.2
Effective Green, g (s)	16.2	53.1	53.1	17.8	54.7	54.7	2.9	9.1		4.0	10.2	16.2
Actuated g/C Ratio	0.16	0.53	0.53	0.18	0.55	0.55	0.03	0.09		0.04	0.10	0.16
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	292	1916	857	321	1974	883	52	289		72	368	261
v/s Ratio Prot	0.07	0.24		c0.15	c0.46		0.02	0.02		c0.03	c0.02	
v/s Ratio Perm			0.03			0.02						0.01
v/c Ratio	0.43	0.45	0.05	0.84	0.84	0.03	0.62	0.24		0.83	0.22	0.06
Uniform Delay, d1	37.8	14.5	11.3	39.7	18.9	10.5	48.0	42.2		47.7	41.2	35.5
Progression Factor	1.00	1.00	1.00	1.33	0.53	0.38	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8	0.1	12.9	3.2	0.1	14.2	0.7		51.5	0.5	0.0
Delay (s)	38.2	15.3	11.4	65.8	13.3	4.0	62.2	43.0		99.1	41.8	35.5
Level of Service	D	B	B	E	B	A	E	D		F	D	D
Approach Delay (s)		17.7			20.2			45.2			53.6	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

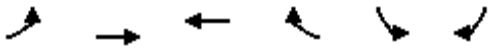
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	733	49	34	1710	19	29	88	24	9	23	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1837		1805	1900	1615
Flt Permitted	0.07	1.00	1.00	0.33	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (perm)	133	3610	1615	630	3610	1615		1837		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	14	788	53	37	1839	20	31	95	26	10	25	95
RTOR Reduction (vph)	0	0	10	0	0	6	0	9	0	0	0	89
Lane Group Flow (vph)	14	788	43	37	1839	14	0	143	0	10	25	6
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	70.3	70.3	70.3	70.3	70.3	70.3		13.1		6.1	6.1	6.1
Effective Green, g (s)	70.3	70.3	70.3	70.3	70.3	70.3		13.1		6.1	6.1	6.1
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70		0.13		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	93	2537	1135	442	2537	1135		240		110	115	98
v/s Ratio Prot		0.22			c0.51			c0.08		0.01	c0.01	
v/s Ratio Perm	0.10		0.03	0.06		0.01						0.00
v/c Ratio	0.15	0.31	0.04	0.08	0.72	0.01		0.60		0.09	0.22	0.06
Uniform Delay, d1	4.9	5.6	4.5	4.7	9.0	4.4		41.0		44.3	44.7	44.2
Progression Factor	1.61	1.34	1.87	0.88	0.64	1.06		1.00		1.00	1.00	1.00
Incremental Delay, d2	3.1	0.3	0.1	0.3	1.5	0.0		4.0		0.4	1.0	0.3
Delay (s)	11.1	7.9	8.5	4.4	7.3	4.7		44.9		44.7	45.6	44.5
Level of Service	B	A	A	A	A	A		D		D	D	D
Approach Delay (s)		8.0			7.2			44.9			44.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	715	69	140	1593	236	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	777	75	152	1732	257	207
RTOR Reduction (vph)	0	19	0	0	0	182
Lane Group Flow (vph)	777	56	152	1732	257	25
Turn Type	NA	Perm	Prot	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	56.3	56.3	19.0	79.3	12.2	12.2
Effective Green, g (s)	56.3	56.3	19.0	79.3	12.2	12.2
Actuated g/C Ratio	0.56	0.56	0.19	0.79	0.12	0.12
Clearance Time (s)	4.5	4.5	4.0	4.5	4.0	4.0
Vehicle Extension (s)	4.5	4.5	3.0	4.5	3.0	3.0
Lane Grp Cap (vph)	2032	909	342	2862	427	197
v/s Ratio Prot	0.22		0.08	c0.48	c0.07	
v/s Ratio Perm		0.03				0.02
v/c Ratio	0.38	0.06	0.44	0.61	0.60	0.13
Uniform Delay, d1	12.2	9.9	35.8	4.1	41.6	39.2
Progression Factor	1.05	1.17	0.84	0.54	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.8	0.8	2.4	0.3
Delay (s)	13.3	11.7	31.0	3.0	44.0	39.5
Level of Service	B	B	C	A	D	D
Approach Delay (s)	13.1			5.3	42.0	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	77	778	1666	0	332	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.11	1.00	1.00		0.95	1.00
Satd. Flow (perm)	202	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	79	802	1718	0	342	69
RTOR Reduction (vph)	0	0	0	0	0	28
Lane Group Flow (vph)	79	802	1718	0	342	41
Turn Type	Perm	NA	NA		NA	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	77.5	77.5	77.5		15.0	15.0
Effective Green, g (s)	77.5	77.5	77.5		15.0	15.0
Actuated g/C Ratio	0.78	0.78	0.78		0.15	0.15
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	156	2797	2797		525	242
v/s Ratio Prot		0.22	c0.48		c0.10	
v/s Ratio Perm	0.39					0.03
v/c Ratio	0.51	0.29	0.61		0.65	0.17
Uniform Delay, d1	4.2	3.3	4.8		40.0	37.1
Progression Factor	1.56	0.87	0.65		0.95	0.97
Incremental Delay, d2	10.5	0.2	0.5		2.9	0.3
Delay (s)	17.0	3.1	3.7		41.1	36.1
Level of Service	B	A	A		D	D
Approach Delay (s)		4.3	3.7		40.2	
Approach LOS		A	A		D	

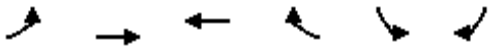
Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	995	176	85	2748	650	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.22	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	415	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1070	189	91	2955	699	88
RTOR Reduction (vph)	0	36	0	0	0	26
Lane Group Flow (vph)	1070	153	91	2955	699	62
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	269	3371	945	436
v/s Ratio Prot	0.30			c0.57	c0.20	
v/s Ratio Perm		0.09	0.22			0.04
v/c Ratio	0.46	0.15	0.34	0.88	0.74	0.14
Uniform Delay, d1	8.7	6.8	7.9	14.2	33.3	27.7
Progression Factor	0.35	0.34	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.3	3.4	3.6	5.2	0.7
Delay (s)	3.7	2.6	11.2	17.8	38.5	28.4
Level of Service	A	A	B	B	D	C
Approach Delay (s)	3.5			17.6	37.3	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

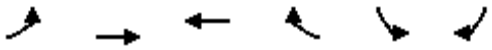
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	667	0	210	548	871	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	695	0	219	571	907	120
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	695	0	219	571	907	120
Turn Type	NA		Prot	NA	NA	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	44.5		10.9	59.4	32.6	100.0
Effective Green, g (s)	44.5		10.9	59.4	32.6	100.0
Actuated g/C Ratio	0.44		0.11	0.59	0.33	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1606		381	2144	1141	1615
v/s Ratio Prot	c0.19		c0.06	0.16	c0.26	
v/s Ratio Perm						0.07
v/c Ratio	0.43		0.57	0.27	0.79	0.07
Uniform Delay, d1	19.1		42.3	9.8	30.7	0.0
Progression Factor	1.00		1.31	0.62	1.00	1.00
Incremental Delay, d2	0.9		1.4	0.3	3.9	0.1
Delay (s)	19.9		57.0	6.3	34.6	0.1
Level of Service	B		E	A	C	A
Approach Delay (s)	19.9			20.4	30.5	
Approach LOS	B			C	C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	225	583	480	182	384	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	271	702	578	219	463	290
RTOR Reduction (vph)	0	0	0	111	0	235
Lane Group Flow (vph)	271	702	578	108	463	55
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	70.4	49.4	49.4	19.1	19.1
Effective Green, g (s)	18.0	70.4	49.4	49.4	19.1	19.1
Actuated g/C Ratio	0.18	0.70	0.49	0.49	0.19	0.19
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2541	1783	797	668	308
v/s Ratio Prot	c0.15	0.19	c0.16		c0.13	
v/s Ratio Perm				0.07		0.03
v/c Ratio	0.84	0.28	0.32	0.14	0.69	0.18
Uniform Delay, d1	39.6	5.4	15.2	13.7	37.7	33.9
Progression Factor	0.82	1.67	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.7	0.3	0.5	0.4	3.1	0.3
Delay (s)	48.0	9.3	15.7	14.1	40.8	34.2
Level of Service	D	A	B	B	D	C
Approach Delay (s)		20.1	15.3		38.3	
Approach LOS		C	B		D	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	956	412	0	346	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	1086	468	0	393	289
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1086	468	0	393	289
Turn Type		NA	NA		NA	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		33.4	33.4		17.0	60.0
Effective Green, g (s)		33.4	33.4		17.0	60.0
Actuated g/C Ratio		0.56	0.56		0.28	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2887	2009		511	1615
v/s Ratio Prot		c0.21	0.13		c0.22	
v/s Ratio Perm						0.18
v/c Ratio		0.38	0.23		0.77	0.18
Uniform Delay, d1		7.5	6.8		19.7	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.4	0.3		6.9	0.2
Delay (s)		7.8	7.0		26.6	0.2
Level of Service		A	A		C	A
Approach Delay (s)		7.8	7.0		15.4	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

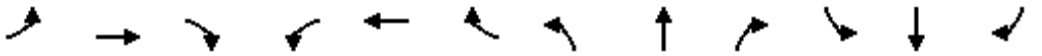
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1127	36	0	412	375	0	0	28	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	1186	38	0	434	395	0	0	29	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	434			1224			1403	1620	593	1056	1658	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	434			957			1163	1412	231	764	1456	217
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	96	100	100	100
cM capacity (veh/h)	1137			632			132	121	676	247	114	794

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	593	593	38	217	217	395	29
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	38	0	0	395	29
cSH	1700	1700	1700	1700	1700	1700	676
Volume to Capacity	0.35	0.35	0.02	0.13	0.13	0.23	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.6
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.6
Approach LOS							B

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	41.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	989	183	0	575	193	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	3.0	3.0
Lane Util. Factor	0.95	1.00		0.95	0.97	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3610	1615		3610	3502	1615
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	3610	1615		3610	3502	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1087	201	0	632	212	16
RTOR Reduction (vph)	0	40	0	0	0	14
Lane Group Flow (vph)	1087	161	0	632	212	2
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	80.1	80.1		80.1	11.4	11.4
Effective Green, g (s)	80.1	80.1		80.1	11.4	11.4
Actuated g/C Ratio	0.80	0.80		0.80	0.11	0.11
Clearance Time (s)	5.5	5.5		5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0		2.0	3.0	3.0
Lane Grp Cap (vph)	2891	1293		2891	399	184
v/s Ratio Prot	c0.30			0.18	c0.06	
v/s Ratio Perm		0.10				0.00
v/c Ratio	0.38	0.12		0.22	0.53	0.01
Uniform Delay, d1	2.8	2.2		2.4	41.8	39.3
Progression Factor	1.00	1.00		0.86	1.00	1.00
Incremental Delay, d2	0.4	0.2		0.2	1.4	0.0
Delay (s)	3.2	2.4		2.2	43.1	39.3
Level of Service	A	A		A	D	D
Approach Delay (s)	3.1			2.2	42.9	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	112	18	96	59	2	8	0	83	7	11	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3536		1805	3596		1805	1615			1729	
Flt Permitted	0.71	1.00		0.65	1.00		0.88	1.00			0.94	
Satd. Flow (perm)	1341	3536		1236	3596		1674	1615			1643	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	9	138	22	119	73	2	10	0	102	9	14	37
RTOR Reduction (vph)	0	5	0	0	0	0	0	92	0	0	34	0
Lane Group Flow (vph)	9	155	0	119	75	0	10	10	0	0	26	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Effective Green, g (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	1048	2763		966	2810		156	150			153	
v/s Ratio Prot		0.04			0.02			0.01				
v/s Ratio Perm	0.01			c0.10			0.01				c0.02	
v/c Ratio	0.01	0.06		0.12	0.03		0.06	0.06			0.17	
Uniform Delay, d1	1.4	1.5		1.6	1.5		24.8	24.8			25.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.0		0.3	0.0		0.2	0.2			0.5	
Delay (s)	1.5	1.5		1.8	1.5		25.0	25.0			25.6	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.5			1.7			25.0			25.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



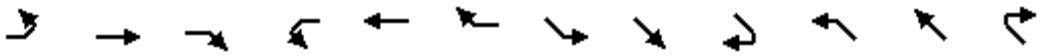
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1036	1046	725	1005	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	1.00	1.00
Adj. Flow (vph)	1091	1101	763	1058	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1091	1101	763	1058	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.51	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	c0.30		c0.42	0.29		
v/s Ratio Perm		0.68				
v/c Ratio	1.01	0.68	0.82	0.32		
Uniform Delay, d1	21.0	0.0	12.2	0.4		
Progression Factor	1.00	1.00	0.93	1.00		
Incremental Delay, d2	29.2	2.3	8.0	0.1		
Delay (s)	50.2	2.3	19.4	0.4		
Level of Service	D	A	B	A		
Approach Delay (s)	26.1			8.4	0.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	819	0	0	619	0	1036	0	0	1110	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	844	0	0	638	0	1068	0	0	1144	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.75	0.75	0.71	0.75	0.75	0.92	0.92			0.71		
vC, conflicting volume	2278	2212	534	2523	2212	572	1144			1068		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1534	1446	0	1859	1446	348	973			276		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	0	0	100	0	100			100		
cM capacity (veh/h)	0	100	774	0	100	599	656			921		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	844	638	534	534	572	572
Volume Left	0	0	0	0	0	0
Volume Right	844	638	0	0	0	0
cSH	774	599	1700	1700	1700	1700
Volume to Capacity	1.09	1.07	0.31	0.31	0.34	0.34
Queue Length 95th (ft)	569	453	0	0	0	0
Control Delay (s)	82.2	81.6	0.0	0.0	0.0	0.0
Lane LOS	F	F				
Approach Delay (s)	82.2	81.6	0.0		0.0	
Approach LOS	F	F				

Intersection Summary				
Average Delay	32.9			
Intersection Capacity Utilization	86.0%	ICU Level of Service		E
Analysis Period (min)	15			



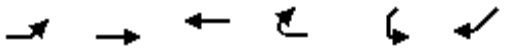
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	819	0	0	619	0	1036	0	0	1110	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	844	0	0	638	0	1068	0	0	1144	0
RTOR Reduction (vph)	0	0	25	0	0	11	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	819	0	0	627	0	1068	0	0	1144	0
Turn Type			custom			custom		NA			NA	
Protected Phases								6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			26.4			26.4		25.6			25.6	
Effective Green, g (s)			26.4			26.4		25.6			25.6	
Actuated g/C Ratio			0.44			0.44		0.43			0.43	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1250			723		1540			2213	
v/s Ratio Prot								c0.30			0.22	
v/s Ratio Perm			0.29			c0.38						
v/c Ratio			0.66			0.87		0.69			0.52	
Uniform Delay, d1			13.2			15.2		14.0			12.7	
Progression Factor			1.00			1.00		1.11			0.90	
Incremental Delay, d2			1.3			10.7		0.2			0.8	
Delay (s)			14.5			26.0		15.8			12.2	
Level of Service			B			C		B			B	
Approach Delay (s)		14.5			26.0			15.8			12.2	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1834	21	0	1102	8	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	3.0	
Lane Util. Factor	0.95	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	0.91	
Flt Protected	1.00	1.00		1.00	0.98	
Satd. Flow (prot)	3610	1615		3610	1696	
Flt Permitted	1.00	1.00		1.00	0.98	
Satd. Flow (perm)	3610	1615		3610	1696	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1931	22	0	1160	8	18
RTOR Reduction (vph)	0	1	0	0	17	0
Lane Group Flow (vph)	1931	21	0	1160	9	0
Turn Type	NA	Perm	Prot	NA	NA	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	49.7	49.7		49.7	2.8	
Effective Green, g (s)	49.7	49.7		49.7	2.8	
Actuated g/C Ratio	0.83	0.83		0.83	0.05	
Clearance Time (s)	4.5	4.5		4.5	3.0	
Vehicle Extension (s)	3.5	3.5		4.5	3.0	
Lane Grp Cap (vph)	2990	1337		2990	79	
v/s Ratio Prot	c0.53			0.32	c0.01	
v/s Ratio Perm		0.01				
v/c Ratio	0.65	0.02		0.39	0.11	
Uniform Delay, d1	1.9	0.9		1.3	27.4	
Progression Factor	1.14	0.39		1.00	1.00	
Incremental Delay, d2	0.9	0.0		0.4	0.6	
Delay (s)	3.1	0.4		1.7	28.0	
Level of Service	A	A		A	C	
Approach Delay (s)	3.1			1.7	28.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	32	1819	1046	10	17	57
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	1977	1137	11	18	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.83				0.79	0.83
vC, conflicting volume	1148				2195	568
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	768				1017	70
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				90	92
cM capacity (veh/h)	709				179	817

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	35	989	989	568	568	11	80
Volume Left	35	0	0	0	0	0	18
Volume Right	0	0	0	0	0	11	62
cSH	709	1700	1700	1700	1700	1700	449
Volume to Capacity	0.05	0.58	0.58	0.33	0.33	0.01	0.18
Queue Length 95th (ft)	4	0	0	0	0	0	16
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	0.0	14.8
Lane LOS	B						B
Approach Delay (s)	0.2			0.0			14.8
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	80	1737	19	76	863	60	98	72	411	43	19	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3149		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3149		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	89	1930	21	84	959	67	109	80	457	48	21	106
RTOR Reduction (vph)	0	0	9	0	0	31	0	336	0	0	0	94
Lane Group Flow (vph)	89	1930	12	84	959	36	109	201	0	48	21	12
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	11.0	57.4	57.4	6.7	53.1	53.1	12.5	16.1		3.8	7.4	11.0
Effective Green, g (s)	11.0	57.4	57.4	6.7	53.1	53.1	12.5	16.1		3.8	7.4	11.0
Actuated g/C Ratio	0.11	0.57	0.57	0.07	0.53	0.53	0.12	0.16		0.04	0.07	0.11
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	198	2072	927	120	1916	857	225	506		68	267	177
v/s Ratio Prot	c0.05	c0.53		c0.05	0.27		c0.06	c0.06		c0.03	0.01	
v/s Ratio Perm			0.01			0.02						0.01
v/c Ratio	0.45	0.93	0.01	0.70	0.50	0.04	0.48	0.40		0.71	0.08	0.07
Uniform Delay, d1	41.7	19.5	9.1	45.7	15.0	11.2	40.7	37.6		47.5	43.1	39.9
Progression Factor	1.00	1.00	1.00	1.27	0.66	0.44	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	9.1	0.0	13.0	0.9	0.1	0.6	0.9		23.7	0.2	0.1
Delay (s)	42.3	28.6	9.2	70.9	10.8	5.0	41.3	38.5		71.3	43.3	40.0
Level of Service	D	C	A	E	B	A	D	D		E	D	D
Approach Delay (s)		29.0			15.0			39.0			48.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

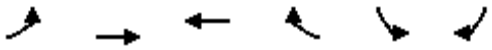
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	2206	213	45	850	12	63	33	21	40	81	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1804		1805	1900	1615
Flt Permitted	0.28	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	535	3610	1615	110	3610	1615		1804		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	55	2372	229	48	914	13	68	35	23	43	87	20
RTOR Reduction (vph)	0	0	10	0	0	4	0	10	0	0	0	18
Lane Group Flow (vph)	55	2372	219	48	914	9	0	116	0	43	87	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	69.1	69.1	69.1	69.1	69.1	69.1		11.7		8.7	8.7	8.7
Effective Green, g (s)	69.1	69.1	69.1	69.1	69.1	69.1		11.7		8.7	8.7	8.7
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.69		0.12		0.09	0.09	0.09
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	369	2494	1115	76	2494	1115		211		157	165	140
v/s Ratio Prot		c0.66			0.25			c0.06		0.02	c0.05	
v/s Ratio Perm	0.10		0.14	0.44		0.01						0.00
v/c Ratio	0.15	0.95	0.20	0.63	0.37	0.01		0.55		0.27	0.53	0.01
Uniform Delay, d1	5.3	13.9	5.5	8.5	6.4	4.8		41.7		42.7	43.7	41.7
Progression Factor	1.59	1.17	1.62	0.99	0.64	0.32		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	7.2	0.3	33.0	0.4	0.0		3.1		0.9	3.0	0.0
Delay (s)	9.0	23.4	9.2	41.4	4.5	1.5		44.8		43.6	46.7	41.8
Level of Service	A	C	A	D	A	A		D		D	D	D
Approach Delay (s)		21.9			6.3			44.8			45.2	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1876	407	253	810	93	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2039	442	275	880	101	146
RTOR Reduction (vph)	0	39	0	0	0	134
Lane Group Flow (vph)	2039	403	275	880	101	12
Turn Type	NA	Perm	Prot	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	60.0	60.0	19.0	83.0	8.5	8.5
Effective Green, g (s)	60.0	60.0	19.0	83.0	8.5	8.5
Actuated g/C Ratio	0.60	0.60	0.19	0.83	0.08	0.08
Clearance Time (s)	4.5	4.5	4.0	4.5	4.0	4.0
Vehicle Extension (s)	4.5	4.5	3.0	4.5	3.0	3.0
Lane Grp Cap (vph)	2166	969	342	2996	297	137
v/s Ratio Prot	c0.56		c0.15	0.24	c0.03	
v/s Ratio Perm		0.25				0.01
v/c Ratio	0.94	0.42	0.80	0.29	0.34	0.09
Uniform Delay, d1	18.4	10.7	38.7	1.9	43.1	42.2
Progression Factor	1.08	1.50	0.87	1.04	1.00	1.00
Incremental Delay, d2	4.6	0.5	12.0	0.2	0.7	0.3
Delay (s)	24.5	16.5	45.9	2.2	43.8	42.5
Level of Service	C	B	D	A	D	D
Approach Delay (s)	23.0			12.6	43.0	
Approach LOS	C			B	D	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	1988	943	0	885	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.24	1.00	1.00		0.95	1.00
Satd. Flow (perm)	453	3610	3610		3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2161	1025	0	962	129
RTOR Reduction (vph)	0	0	0	0	0	75
Lane Group Flow (vph)	49	2161	1025	0	962	54
Turn Type	Perm	NA	NA		NA	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	66.5	66.5	66.5		26.0	26.0
Effective Green, g (s)	66.5	66.5	66.5		26.0	26.0
Actuated g/C Ratio	0.66	0.66	0.66		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	301	2400	2400		910	419
v/s Ratio Prot		c0.60	0.28		c0.27	
v/s Ratio Perm	0.11					0.03
v/c Ratio	0.16	0.90	0.43		1.06	0.13
Uniform Delay, d1	6.3	14.0	7.8		37.0	28.3
Progression Factor	0.66	1.42	1.22		0.92	0.91
Incremental Delay, d2	0.5	2.7	0.5		45.4	0.1
Delay (s)	4.7	22.5	10.1		79.6	25.9
Level of Service	A	C	B		E	C
Approach Delay (s)		22.1	10.1		73.2	
Approach LOS		C	B		E	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

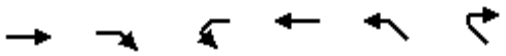


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2436	412	75	1200	272	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	117	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	2619	443	81	1290	292	110
RTOR Reduction (vph)	0	35	0	0	0	3
Lane Group Flow (vph)	2619	408	81	1290	292	107
Turn Type	NA	Perm	Perm	NA	NA	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	76	3371	945	436
v/s Ratio Prot	c0.73			0.25	c0.08	
v/s Ratio Perm		0.25	0.69			0.07
v/c Ratio	1.12	0.39	1.07	0.38	0.31	0.25
Uniform Delay, d1	17.5	8.2	17.5	8.2	29.1	28.5
Progression Factor	0.95	1.09	1.00	1.00	1.00	1.00
Incremental Delay, d2	54.9	0.4	122.4	0.3	0.8	1.3
Delay (s)	71.5	9.4	139.9	8.5	29.9	29.9
Level of Service	E	A	F	A	C	C
Approach Delay (s)	62.5			16.2	29.9	
Approach LOS	E			B	C	

Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

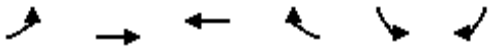
APPENDIX N

Long Range (2035) With Project Conditions
Intersection Analysis Worksheets



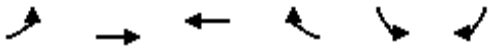
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	456	0	131	1368	1138	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	480	0	138	1440	1198	242
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	480	0	138	1440	1198	242
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	41.1		7.2	52.3	39.7	100.0
Effective Green, g (s)	41.1		7.2	52.3	39.7	100.0
Actuated g/C Ratio	0.41		0.07	0.52	0.40	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1483		252	1888	1390	1615
v/s Ratio Prot	0.13		0.04	c0.40	c0.34	
v/s Ratio Perm						0.15
v/c Ratio	0.32		0.55	0.76	0.86	0.15
Uniform Delay, d1	20.0		44.8	18.9	27.6	0.0
Progression Factor	1.00		1.44	0.45	1.00	1.00
Incremental Delay, d2	0.6		1.1	2.1	5.7	0.2
Delay (s)	20.6		65.8	10.6	33.4	0.2
Level of Service	C		E	B	C	A
Approach Delay (s)	20.6			15.5	27.8	
Approach LOS	C			B	C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



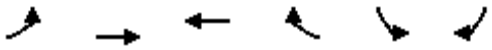
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	258	436	1346	590	109	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	300	507	1565	686	127	217
RTOR Reduction (vph)	0	0	0	234	0	197
Lane Group Flow (vph)	300	507	1565	452	127	20
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	80.1	59.1	59.1	9.4	9.4
Effective Green, g (s)	18.0	80.1	59.1	59.1	9.4	9.4
Actuated g/C Ratio	0.18	0.80	0.59	0.59	0.09	0.09
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2891	2133	954	329	151
v/s Ratio Prot	c0.17	0.14	c0.43		c0.04	
v/s Ratio Perm				0.28		0.01
v/c Ratio	0.93	0.18	0.73	0.47	0.39	0.14
Uniform Delay, d1	40.3	2.3	14.8	11.6	42.6	41.6
Progression Factor	0.73	1.71	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.5	0.1	2.3	1.7	0.8	0.4
Delay (s)	60.0	4.1	17.0	13.3	43.3	42.0
Level of Service	E	A	B	B	D	D
Approach Delay (s)		24.9	15.9		42.5	
Approach LOS		C	B		D	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



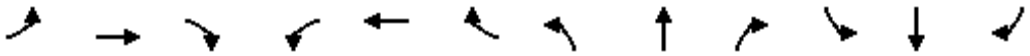
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	523	1455	0	628	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	601	1672	0	722	549
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	601	1672	0	722	549
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		30.5	30.5		19.9	60.0
Effective Green, g (s)		30.5	30.5		19.9	60.0
Actuated g/C Ratio		0.51	0.51		0.33	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2636	1835		598	1615
v/s Ratio Prot		0.12	c0.46		c0.40	
v/s Ratio Perm						0.34
v/c Ratio		0.23	0.91		1.21	0.34
Uniform Delay, d1		8.2	13.5		20.1	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	8.3		108.4	0.6
Delay (s)		8.4	21.8		128.4	0.6
Level of Service		A	C		F	A
Approach Delay (s)		8.4	21.8		73.2	
Approach LOS		A	C		E	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	523	1455	0	628	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		3502	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		3502	1615
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	523	1455	0	628	478
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	523	1455	0	628	478
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		34.4	34.4		16.0	60.0
Effective Green, g (s)		34.4	34.4		16.0	60.0
Actuated g/C Ratio		0.57	0.57		0.27	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2973	2069		933	1615
v/s Ratio Prot		0.10	c0.40		c0.18	
v/s Ratio Perm						0.30
v/c Ratio		0.18	0.70		0.67	0.30
Uniform Delay, d1		6.1	9.2		19.7	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	2.0		1.9	0.5
Delay (s)		6.2	11.2		21.6	0.5
Level of Service		A	B		C	A
Approach Delay (s)		6.2	11.2		12.5	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	793	84	0	1455	668	0	0	48	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	835	88	0	1532	703	0	0	51	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked				0.97			0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	1532			923			1601	2366	417	1999	2455	766
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1532			854			1554	2345	332	1966	2437	766
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	92	100	100	100
cM capacity (veh/h)	440			768			76	36	649	34	31	350

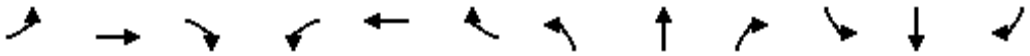
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	417	417	88	766	766	703	51
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	88	0	0	703	51
cSH	1700	1700	1700	1700	1700	1700	649
Volume to Capacity	0.25	0.25	0.05	0.45	0.45	0.41	0.08
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.0
Lane LOS							B
Approach Delay (s)	0.0			0.0			11.0
Approach LOS							B

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	44.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	565	257	131	1946	210	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.42	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	807	3610	3502	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	601	273	139	2070	223	107
RTOR Reduction (vph)	0	55	0	0	0	94
Lane Group Flow (vph)	601	218	139	2070	223	13
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	79.8	79.8	79.8	79.8	11.7	11.7
Effective Green, g (s)	79.8	79.8	79.8	79.8	11.7	11.7
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.12	0.12
Clearance Time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	2880	1288	643	2880	409	188
v/s Ratio Prot	0.17			c0.57	c0.06	
v/s Ratio Perm		0.13	0.17			0.01
v/c Ratio	0.21	0.17	0.22	0.72	0.55	0.07
Uniform Delay, d1	2.4	2.4	2.5	4.8	41.6	39.3
Progression Factor	1.00	1.00	0.67	0.84	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.5	1.1	1.5	0.2
Delay (s)	2.6	2.6	2.2	5.1	43.1	39.4
Level of Service	A	A	A	A	D	D
Approach Delay (s)	2.6			4.9	41.9	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	189	10	129	277	11	3	2	114	3	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85			0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3582		1805	3589		1805	1620			1683	
Flt Permitted	0.56	1.00		0.62	1.00		0.75	1.00			0.92	
Satd. Flow (perm)	1067	3582		1172	3589		1423	1620			1574	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	205	11	140	301	12	3	2	124	3	0	10
RTOR Reduction (vph)	0	2	0	0	2	0	0	112	0	0	12	0
Lane Group Flow (vph)	16	214	0	140	311	0	3	14	0	0	1	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	46.8	46.8		46.8	46.8		5.7	5.7			5.7	
Effective Green, g (s)	46.8	46.8		46.8	46.8		5.7	5.7			5.7	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.10	0.10			0.10	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	832	2793		914	2799		135	153			149	
v/s Ratio Prot		0.06			0.09			c0.01				
v/s Ratio Perm	0.01			c0.12			0.00				0.00	
v/c Ratio	0.02	0.08		0.15	0.11		0.02	0.09			0.01	
Uniform Delay, d1	1.5	1.5		1.6	1.6		24.6	24.8			24.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.4	0.1		0.1	0.3			0.0	
Delay (s)	1.5	1.6		2.0	1.7		24.7	25.0			24.6	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.6			1.8			25.0			24.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



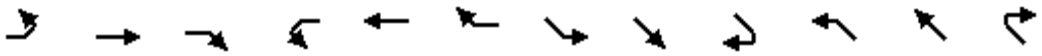
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	349	627	1052	1485	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	1.00	1.00
Adj. Flow (vph)	371	667	1119	1580	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	371	667	1119	1580	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.51	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	0.10		c0.62	c0.44		
v/s Ratio Perm		0.41				
v/c Ratio	0.34	0.41	1.20	0.48		
Uniform Delay, d1	16.4	0.0	14.6	0.4		
Progression Factor	1.00	1.00	0.75	1.00		
Incremental Delay, d2	0.3	0.8	101.1	0.1		
Delay (s)	16.6	0.8	112.0	0.6		
Level of Service	B	A	F	A		
Approach Delay (s)	6.5			46.8	0.0	
Approach LOS	A			D	A	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	867	0	0	653	0	349	0	0	1884	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	922	0	0	695	0	371	0	0	2004	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.69	0.69	0.93	0.69	0.69	0.65	0.65			0.93		
vC, conflicting volume	2068	2376	186	3112	2376	1002	2004			371		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1165	1611	0	2680	1611	0	1473			161		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	9	100	100	2	100			100		
cM capacity (veh/h)	2	73	1010	1	73	711	302			1324		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	922	695	186	186	1002	1002
Volume Left	0	0	0	0	0	0
Volume Right	922	695	0	0	0	0
cSH	1010	711	1700	1700	1700	1700
Volume to Capacity	0.91	0.98	0.11	0.11	0.59	0.59
Queue Length 95th (ft)	347	378	0	0	0	0
Control Delay (s)	32.0	52.2	0.0	0.0	0.0	0.0
Lane LOS	D	F				
Approach Delay (s)	32.0	52.2	0.0		0.0	
Approach LOS	D	F				

Intersection Summary				
Average Delay	16.5			
Intersection Capacity Utilization	99.2%	ICU Level of Service		F
Analysis Period (min)	15			

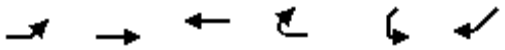


Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	867	0	0	653	0	349	0	0	1884	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	922	0	0	695	0	371	0	0	2004	0
RTOR Reduction (vph)	0	0	360	0	0	10	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	562	0	0	685	0	371	0	0	2004	0
Turn Type			Perm			Perm		NA			NA	
Protected Phases								6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			25.9			25.9		26.1			26.1	
Effective Green, g (s)			25.9			25.9		26.1			26.1	
Actuated g/C Ratio			0.43			0.43		0.44			0.44	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1226			709		1570			2256	
v/s Ratio Prot								0.10			c0.39	
v/s Ratio Perm			0.20			c0.42						
v/c Ratio			0.46			0.97		0.24			0.89	
Uniform Delay, d1			12.1			16.6		10.7			15.6	
Progression Factor			1.00			1.00		0.55			1.37	
Incremental Delay, d2			0.3			25.4		0.3			4.2	
Delay (s)			12.4			42.0		6.2			25.6	
Level of Service			B			D		A			C	
Approach Delay (s)		12.4			42.0			6.2			25.6	
Approach LOS		B			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1121	93	28	1763	122	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3610	1615	1805	3610	1763	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	3610	1615	1805	3610	1763	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1180	98	29	1856	128	53
RTOR Reduction (vph)	0	17	0	0	33	0
Lane Group Flow (vph)	1180	81	29	1856	148	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	37.3	37.3	2.0	42.3	10.2	
Effective Green, g (s)	37.3	37.3	2.0	42.3	10.2	
Actuated g/C Ratio	0.62	0.62	0.03	0.70	0.17	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2244	1003	60	2545	299	
v/s Ratio Prot	0.33		0.02	c0.51	c0.08	
v/s Ratio Perm		0.05				
v/c Ratio	0.53	0.08	0.48	0.73	0.49	
Uniform Delay, d1	6.4	4.5	28.5	5.4	22.6	
Progression Factor	0.82	0.59	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.2	2.2	1.9	1.3	
Delay (s)	6.1	2.8	30.7	7.2	23.9	
Level of Service	A	A	C	A	C	
Approach Delay (s)	5.8			7.6	23.9	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	82	1090	1683	36	10	108
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	85	1135	1753	38	10	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.56				0.65	0.56
vC, conflicting volume	1791				2492	877
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	838				967	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	81				92	82
cM capacity (veh/h)	450				134	610

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	85	568	568	877	877	38	123
Volume Left	85	0	0	0	0	0	10
Volume Right	0	0	0	0	0	38	112
cSH	450	1700	1700	1700	1700	1700	469
Volume to Capacity	0.19	0.33	0.33	0.52	0.52	0.02	0.26
Queue Length 95th (ft)	17	0	0	0	0	0	26
Control Delay (s)	14.9	0.0	0.0	0.0	0.0	0.0	15.4
Lane LOS	B						C
Approach Delay (s)	1.0			0.0			15.4
Approach LOS							C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	207	815	76	245	1496	49	29	49	174	54	74	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3187		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3187		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	230	906	84	272	1662	54	32	54	193	60	82	213
RTOR Reduction (vph)	0	0	39	0	0	29	0	175	0	0	0	159
Lane Group Flow (vph)	230	906	45	272	1662	25	32	72	0	60	82	54
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	25.5	53.0	53.0	17.9	45.4	45.4	2.9	9.1		4.0	10.2	25.5
Effective Green, g (s)	25.5	53.0	53.0	17.9	45.4	45.4	2.9	9.1		4.0	10.2	25.5
Actuated g/C Ratio	0.26	0.53	0.53	0.18	0.45	0.45	0.03	0.09		0.04	0.10	0.26
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	460	1913	855	323	1638	733	52	290		72	368	411
v/s Ratio Prot	c0.13	0.25		c0.15	c0.46		0.02	0.02		c0.03	c0.02	
v/s Ratio Perm			0.03			0.02						0.03
v/c Ratio	0.50	0.47	0.05	0.84	1.01	0.03	0.62	0.25		0.83	0.22	0.13
Uniform Delay, d1	31.8	14.7	11.4	39.7	27.3	15.1	48.0	42.3		47.7	41.3	28.7
Progression Factor	1.00	1.00	1.00	1.32	0.63	0.56	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.8	0.1	12.7	22.4	0.1	14.2	0.8		51.5	0.5	0.1
Delay (s)	32.1	15.6	11.5	65.2	39.6	8.5	62.2	43.0		99.1	41.8	28.8
Level of Service	C	B	B	E	D	A	E	D		F	D	C
Approach Delay (s)		18.4			42.2			45.2			43.7	
Approach LOS		B			D			D			D	

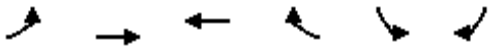
Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	771	49	36	1724	22	29	90	29	9	25	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1832		1805	1900	1615
Flt Permitted	0.07	1.00	1.00	0.31	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (perm)	127	3610	1615	598	3610	1615		1832		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	14	829	53	39	1854	24	31	97	31	10	27	95
RTOR Reduction (vph)	0	0	10	0	0	7	0	10	0	0	0	89
Lane Group Flow (vph)	14	829	43	39	1854	17	0	149	0	10	27	6
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	69.9	69.9	69.9	69.9	69.9	69.9		13.4		6.2	6.2	6.2
Effective Green, g (s)	69.9	69.9	69.9	69.9	69.9	69.9		13.4		6.2	6.2	6.2
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70		0.13		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	88	2523	1128	418	2523	1128		245		111	117	100
v/s Ratio Prot		0.23			c0.51			c0.08		0.01	c0.01	
v/s Ratio Perm	0.11		0.03	0.07		0.01						0.00
v/c Ratio	0.16	0.33	0.04	0.09	0.73	0.01		0.61		0.09	0.23	0.06
Uniform Delay, d1	5.1	5.9	4.7	4.8	9.3	4.6		40.8		44.2	44.6	44.2
Progression Factor	1.68	1.40	1.98	1.12	0.71	1.71		1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	0.3	0.1	0.3	1.3	0.0		4.2		0.4	1.0	0.2
Delay (s)	12.1	8.5	9.3	5.8	7.9	7.9		45.0		44.6	45.6	44.4
Level of Service	B	A	A	A	A	A		D		D	D	D
Approach Delay (s)		8.6			7.9			45.0			44.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	715	69	143	1593	43	236	10	193	12	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	3502	1629		1805	1661	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	3502	1629		1805	1661	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	777	75	155	1732	47	257	11	210	13	4	21
RTOR Reduction (vph)	0	0	35	0	0	17	0	185	0	0	20	0
Lane Group Flow (vph)	47	777	40	155	1732	30	257	36	0	13	5	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	7.2	53.8	53.8	16.8	63.4	63.4	9.0	12.1		0.8	3.9	
Effective Green, g (s)	7.2	53.8	53.8	16.8	63.4	63.4	9.0	12.1		0.8	3.9	
Actuated g/C Ratio	0.07	0.54	0.54	0.17	0.63	0.63	0.09	0.12		0.01	0.04	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	129	1942	868	303	2288	1023	315	197		14	64	
v/s Ratio Prot	0.03	c0.22		0.09	c0.48		c0.07	c0.02		0.01	0.00	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	0.36	0.40	0.05	0.51	0.76	0.03	0.82	0.18		0.93	0.08	
Uniform Delay, d1	44.2	13.6	10.9	37.9	12.9	6.8	44.7	39.5		49.6	46.3	
Progression Factor	1.10	0.97	1.00	0.79	0.48	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.6	0.1	1.2	2.0	0.0	14.9	0.5		201.0	0.5	
Delay (s)	50.3	13.7	11.0	31.2	8.1	6.9	59.6	40.0		250.5	46.8	
Level of Service	D	B	B	C	A	A	E	D		F	D	
Approach Delay (s)		15.4			10.0			50.5			116.5	
Approach LOS		B			A			D			F	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	87	783	1680	0	344	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.10	1.00	1.00		0.95	1.00
Satd. Flow (perm)	196	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	90	807	1732	0	355	102
RTOR Reduction (vph)	0	0	0	0	0	27
Lane Group Flow (vph)	90	807	1732	0	355	75
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	77.1	77.1	77.1		15.4	15.4
Effective Green, g (s)	77.1	77.1	77.1		15.4	15.4
Actuated g/C Ratio	0.77	0.77	0.77		0.15	0.15
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	151	2783	2783		539	248
v/s Ratio Prot		0.22	c0.48		c0.10	
v/s Ratio Perm	0.46					0.05
v/c Ratio	0.60	0.29	0.62		0.66	0.30
Uniform Delay, d1	4.9	3.4	5.0		39.8	37.5
Progression Factor	1.64	1.06	0.68		0.92	0.94
Incremental Delay, d2	15.3	0.2	0.5		2.9	0.7
Delay (s)	23.2	3.8	3.9		39.4	35.8
Level of Service	C	A	A		D	D
Approach Delay (s)		5.8	3.9		38.6	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1009	180	85	2767	657	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.21	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	406	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1085	194	91	2975	706	88
RTOR Reduction (vph)	0	37	0	0	0	26
Lane Group Flow (vph)	1085	157	91	2975	706	62
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	263	3371	945	436
v/s Ratio Prot	0.30			c0.57	c0.20	
v/s Ratio Perm		0.10	0.22			0.04
v/c Ratio	0.46	0.15	0.35	0.88	0.75	0.14
Uniform Delay, d1	8.8	6.8	7.9	14.4	33.4	27.7
Progression Factor	0.36	0.37	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.3	3.6	3.7	5.4	0.7
Delay (s)	3.8	2.8	11.5	18.1	38.8	28.4
Level of Service	A	A	B	B	D	C
Approach Delay (s)	3.6			17.9	37.6	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	431	170	10	1821	255	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	454	179	11	1917	268	13
RTOR Reduction (vph)	0	58	0	0	0	10
Lane Group Flow (vph)	454	121	11	1917	268	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4
Actuated Green, G (s)	67.8	67.8	0.8	72.6	19.4	19.4
Effective Green, g (s)	67.8	67.8	0.8	72.6	19.4	19.4
Actuated g/C Ratio	0.68	0.68	0.01	0.73	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2447	1094	14	2620	350	313
v/s Ratio Prot	0.13		0.01	c0.53	c0.15	
v/s Ratio Perm		0.08				0.00
v/c Ratio	0.19	0.11	0.79	0.73	0.77	0.01
Uniform Delay, d1	5.9	5.6	49.5	8.0	38.1	32.5
Progression Factor	0.85	0.32	1.00	1.14	1.00	1.00
Incremental Delay, d2	0.2	0.2	83.7	0.9	9.6	0.0
Delay (s)	5.2	2.0	133.0	10.1	47.8	32.5
Level of Service	A	A	F	B	D	C
Approach Delay (s)	4.3			10.8	47.1	
Approach LOS	A			B	D	

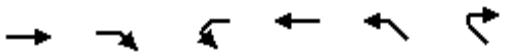
Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	599	66	4	2072	5	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	631	69	4	2181	5	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	350			324		
pX, platoon unblocked			0.97		0.67	0.97
vC, conflicting volume			700		1729	315
vC1, stage 1 conf vol					631	
vC2, stage 2 conf vol					1099	
vCu, unblocked vol			626		887	229
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			935		428	755

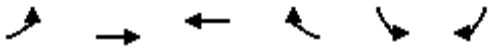
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NE 1
Volume Total	315	315	69	731	1454	7
Volume Left	0	0	0	4	0	5
Volume Right	0	0	69	0	0	2
cSH	1700	1700	1700	935	1700	488
Volume to Capacity	0.19	0.19	0.04	0.00	0.86	0.02
Queue Length 95th (ft)	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.1	0.0	12.5
Lane LOS				A		B
Approach Delay (s)	0.0			0.0		12.5
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		



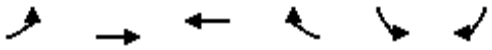
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	680	0	210	559	874	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	708	0	219	582	910	120
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	708	0	219	582	910	120
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases						Free
Actuated Green, G (s)	44.4		10.9	59.3	32.7	100.0
Effective Green, g (s)	44.4		10.9	59.3	32.7	100.0
Actuated g/C Ratio	0.44		0.11	0.59	0.33	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1602		381	2140	1145	1615
v/s Ratio Prot	c0.20		c0.06	0.16	c0.26	
v/s Ratio Perm						0.07
v/c Ratio	0.44		0.57	0.27	0.79	0.07
Uniform Delay, d1	19.2		42.3	9.9	30.6	0.0
Progression Factor	1.00		1.32	0.61	1.00	1.00
Incremental Delay, d2	0.9		1.4	0.3	3.9	0.1
Delay (s)	20.1		57.2	6.3	34.5	0.1
Level of Service	C		E	A	C	A
Approach Delay (s)	20.1			20.2	30.5	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



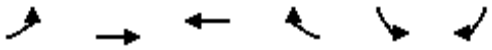
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	225	596	491	183	385	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	271	718	592	220	464	290
RTOR Reduction (vph)	0	0	0	111	0	235
Lane Group Flow (vph)	271	718	592	109	464	55
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	18.0	70.4	49.4	49.4	19.1	19.1
Effective Green, g (s)	18.0	70.4	49.4	49.4	19.1	19.1
Actuated g/C Ratio	0.18	0.70	0.49	0.49	0.19	0.19
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	324	2541	1783	797	668	308
v/s Ratio Prot	c0.15	0.20	c0.16		c0.13	
v/s Ratio Perm				0.07		0.03
v/c Ratio	0.84	0.28	0.33	0.14	0.69	0.18
Uniform Delay, d1	39.6	5.5	15.3	13.7	37.7	33.9
Progression Factor	0.82	1.69	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.6	0.3	0.5	0.4	3.1	0.3
Delay (s)	48.3	9.5	15.8	14.1	40.9	34.2
Level of Service	D	A	B	B	D	C
Approach Delay (s)		20.2	15.3		38.3	
Approach LOS		C	B		D	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	970	424	0	488	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	1102	482	0	555	289
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1102	482	0	555	289
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		30.7	30.7		19.7	60.0
Effective Green, g (s)		30.7	30.7		19.7	60.0
Actuated g/C Ratio		0.51	0.51		0.33	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2654	1847		592	1615
v/s Ratio Prot		c0.21	0.13		c0.31	
v/s Ratio Perm						0.18
v/c Ratio		0.42	0.26		0.94	0.18
Uniform Delay, d1		9.1	8.3		19.6	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.5	0.3		22.5	0.2
Delay (s)		9.6	8.6		42.1	0.2
Level of Service		A	A		D	A
Approach Delay (s)		9.6	8.6		27.7	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	970	424	0	488	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		3502	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		3502	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	1102	482	0	555	289
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1102	482	0	555	289
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		35.6	35.6		14.8	60.0
Effective Green, g (s)		35.6	35.6		14.8	60.0
Actuated g/C Ratio		0.59	0.59		0.25	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		3077	2141		863	1615
v/s Ratio Prot		c0.21	0.13		c0.16	
v/s Ratio Perm						0.18
v/c Ratio		0.36	0.23		0.64	0.18
Uniform Delay, d1		6.3	5.7		20.2	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.2		1.7	0.2
Delay (s)		6.6	6.0		21.9	0.2
Level of Service		A	A		C	A
Approach Delay (s)		6.6	6.0		14.5	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1282	36	0	424	516	0	0	28	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Hourly flow rate (vph)	0	1349	38	0	446	543	0	0	29	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		587										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	446			1387			1573	1796	675	1151	1834	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	446			1104			1322	1584	266	825	1629	223
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	95	100	100	100
cM capacity (veh/h)	1125			544			99	93	628	217	88	786

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	675	675	38	223	223	543	29
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	38	0	0	543	29
cSH	1700	1700	1700	1700	1700	1700	628
Volume to Capacity	0.40	0.40	0.02	0.13	0.13	0.32	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.0
Lane LOS							B
Approach Delay (s)	0.0			0.0			11.0
Approach LOS							B

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	45.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1144	183	108	721	199	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.20	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	389	3610	3502	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1257	201	119	792	219	149
RTOR Reduction (vph)	0	40	0	0	0	97
Lane Group Flow (vph)	1257	161	119	792	219	52
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	79.9	79.9	79.9	79.9	11.6	11.6
Effective Green, g (s)	79.9	79.9	79.9	79.9	11.6	11.6
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.12	0.12
Clearance Time (s)	5.5	5.5	5.5	5.5	3.0	3.0
Vehicle Extension (s)	4.0	4.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	2884	1290	310	2884	406	187
v/s Ratio Prot	c0.35			0.22	c0.06	
v/s Ratio Perm		0.10	0.31			0.03
v/c Ratio	0.44	0.12	0.38	0.27	0.54	0.28
Uniform Delay, d1	3.1	2.2	2.9	2.6	41.7	40.4
Progression Factor	1.00	1.00	1.50	1.28	1.00	1.00
Incremental Delay, d2	0.5	0.2	3.5	0.2	1.4	0.8
Delay (s)	3.6	2.4	7.8	3.5	43.1	41.2
Level of Service	A	A	A	A	D	D
Approach Delay (s)	3.4			4.1	42.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	230	18	98	164	3	8	0	92	8	11	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3571		1805	3599		1805	1615			1730	
Flt Permitted	0.62	1.00		0.57	1.00		0.87	1.00			0.94	
Satd. Flow (perm)	1183	3571		1074	3599		1659	1615			1632	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	9	284	22	121	202	4	10	0	114	10	14	37
RTOR Reduction (vph)	0	4	0	0	1	0	0	103	0	0	34	0
Lane Group Flow (vph)	9	302	0	121	205	0	10	11	0	0	27	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			4	
Permitted Phases	6			2	2		4			4		
Actuated Green, G (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Effective Green, g (s)	46.9	46.9		46.9	46.9		5.6	5.6			5.6	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.09	0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5		3.0	3.0			3.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	924	2791		839	2813		154	150			152	
v/s Ratio Prot		0.08			0.06			0.01				
v/s Ratio Perm	0.01			c0.11			0.01				c0.02	
v/c Ratio	0.01	0.11		0.14	0.07		0.06	0.07			0.18	
Uniform Delay, d1	1.4	1.6		1.6	1.5		24.8	24.8			25.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.4	0.1		0.2	0.2			0.6	
Delay (s)	1.5	1.6		2.0	1.6		25.0	25.0			25.7	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		1.6			1.7			25.0			25.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



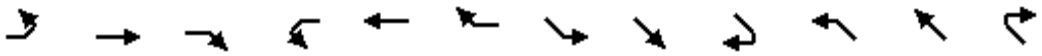
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1039	1046	845	1008	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	1.00	1.00
Adj. Flow (vph)	1094	1101	889	1061	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1094	1101	889	1061	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	4		2	6 4		
Permitted Phases		Free				
Actuated Green, G (s)	18.0	60.0	30.9	60.0		
Effective Green, g (s)	18.0	60.0	30.9	54.5		
Actuated g/C Ratio	0.30	1.00	0.51	0.91		
Clearance Time (s)	5.5		5.6			
Vehicle Extension (s)	4.0		5.0			
Lane Grp Cap (vph)	1083	1615	929	3279		
v/s Ratio Prot	c0.30		c0.49	0.29		
v/s Ratio Perm		0.68				
v/c Ratio	1.01	0.68	0.96	0.32		
Uniform Delay, d1	21.0	0.0	13.9	0.4		
Progression Factor	1.00	1.00	0.93	1.00		
Incremental Delay, d2	29.9	2.3	20.5	0.1		
Delay (s)	50.9	2.3	33.5	0.4		
Level of Service	D	A	C	A		
Approach Delay (s)	26.5			15.5	0.0	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	0	948	0	0	619	0	1039	0	0	1233	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	977	0	0	638	0	1071	0	0	1271	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								347			214	
pX, platoon unblocked	0.76	0.76	0.71	0.76	0.76	0.90	0.90			0.71		
vC, conflicting volume	2345	2342	536	2784	2342	636	1271			1071		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1535	1532	0	2114	1532	369	1077			273		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	0	0	100	0	100			100		
cM capacity (veh/h)	0	89	772	0	89	569	589			921		

Direction, Lane #	EB 1	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	977	638	536	536	636	636
Volume Left	0	0	0	0	0	0
Volume Right	977	638	0	0	0	0
cSH	772	569	1700	1700	1700	1700
Volume to Capacity	1.27	1.12	0.32	0.32	0.37	0.37
Queue Length 95th (ft)	898	509	0	0	0	0
Control Delay (s)	148.7	101.2	0.0	0.0	0.0	0.0
Lane LOS	F	F				
Approach Delay (s)	148.7	101.2	0.0		0.0	
Approach LOS	F	F				

Intersection Summary				
Average Delay	53.0			
Intersection Capacity Utilization	94.1%	ICU Level of Service		F
Analysis Period (min)	15			



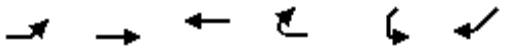
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	948	0	0	619	0	1039	0	0	1233	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0			4.0		4.0			4.0	
Lane Util. Factor			0.88			1.00		0.95			0.91	
Frt			0.85			0.86		1.00			1.00	
Flt Protected			1.00			1.00		1.00			1.00	
Satd. Flow (prot)			2842			1644		3610			5187	
Flt Permitted			1.00			1.00		1.00			1.00	
Satd. Flow (perm)			2842			1644		3610			5187	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	977	0	0	638	0	1071	0	0	1271	0
RTOR Reduction (vph)	0	0	24	0	0	10	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	953	0	0	628	0	1071	0	0	1271	0
Turn Type			Prot			Prot		NA			NA	
Protected Phases			4			8		6			2	
Permitted Phases			4			8						
Actuated Green, G (s)			26.4			26.4		25.6			25.6	
Effective Green, g (s)			26.4			26.4		25.6			25.6	
Actuated g/C Ratio			0.44			0.44		0.43			0.43	
Clearance Time (s)			4.0			4.0		4.0			4.0	
Vehicle Extension (s)			3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)			1250			723		1540			2213	
v/s Ratio Prot			0.34			c0.38		c0.30			0.25	
v/s Ratio Perm												
v/c Ratio			0.76			0.87		0.70			0.57	
Uniform Delay, d1			14.2			15.2		14.0			13.1	
Progression Factor			1.00			1.00		1.85			1.16	
Incremental Delay, d2			2.8			10.8		0.2			1.0	
Delay (s)			17.0			26.0		26.1			16.2	
Level of Service			B			C		C			B	
Approach Delay (s)		17.0			26.0			26.1			16.2	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1965	21	0	1225	8	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	3.0	
Lane Util. Factor	0.95	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	0.91	
Flt Protected	1.00	1.00		1.00	0.98	
Satd. Flow (prot)	3610	1615		3610	1696	
Flt Permitted	1.00	1.00		1.00	0.98	
Satd. Flow (perm)	3610	1615		3610	1696	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2068	22	0	1289	8	18
RTOR Reduction (vph)	0	1	0	0	17	0
Lane Group Flow (vph)	2068	21	0	1289	9	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Actuated Green, G (s)	49.7	49.7		49.7	2.8	
Effective Green, g (s)	49.7	49.7		49.7	2.8	
Actuated g/C Ratio	0.83	0.83		0.83	0.05	
Clearance Time (s)	4.5	4.5		4.5	3.0	
Vehicle Extension (s)	3.5	3.5		4.5	3.0	
Lane Grp Cap (vph)	2990	1337		2990	79	
v/s Ratio Prot	c0.57			0.36	c0.01	
v/s Ratio Perm		0.01				
v/c Ratio	0.69	0.02		0.43	0.11	
Uniform Delay, d1	2.1	0.9		1.4	27.4	
Progression Factor	1.17	0.42		1.00	1.00	
Incremental Delay, d2	1.2	0.0		0.5	0.6	
Delay (s)	3.6	0.4		1.8	28.0	
Level of Service	A	A		A	C	
Approach Delay (s)	3.6			1.8	28.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	3.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



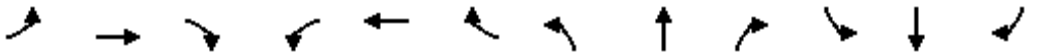
Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	32	1950	1169	10	17	57
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	2120	1271	11	18	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.78				0.32	0.78
vC, conflicting volume	1282				2400	635
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	808				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				94	93
cM capacity (veh/h)	648				312	855

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	35	1060	1060	635	635	11	80
Volume Left	35	0	0	0	0	0	18
Volume Right	0	0	0	0	0	11	62
cSH	648	1700	1700	1700	1700	1700	611
Volume to Capacity	0.05	0.62	0.62	0.37	0.37	0.01	0.13
Queue Length 95th (ft)	4	0	0	0	0	0	11
Control Delay (s)	10.9	0.0	0.0	0.0	0.0	0.0	11.8
Lane LOS	B						B
Approach Delay (s)	0.2			0.0			11.8
Approach LOS							B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

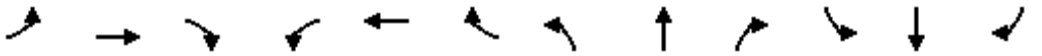
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	193	1755	19	79	886	60	98	74	414	43	21	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3150		1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	3150		1805	3610	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	214	1950	21	88	984	67	109	82	460	48	23	217
RTOR Reduction (vph)	0	0	9	0	0	38	0	334	0	0	0	171
Lane Group Flow (vph)	214	1950	12	88	984	29	109	208	0	48	23	46
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						1
Actuated Green, G (s)	21.1	56.9	56.9	6.9	42.7	42.7	12.8	16.4		3.8	7.4	21.1
Effective Green, g (s)	21.1	56.9	56.9	6.9	42.7	42.7	12.8	16.4		3.8	7.4	21.1
Actuated g/C Ratio	0.21	0.57	0.57	0.07	0.43	0.43	0.13	0.16		0.04	0.07	0.21
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5		3.0	5.5	3.0
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5		0.2	4.5	2.0
Lane Grp Cap (vph)	380	2054	918	124	1541	689	231	516		68	267	340
v/s Ratio Prot	0.12	c0.54		c0.05	0.27		c0.06	c0.07		c0.03	0.01	
v/s Ratio Perm			0.01			0.02						0.03
v/c Ratio	0.56	0.95	0.01	0.71	0.64	0.04	0.47	0.40		0.71	0.09	0.13
Uniform Delay, d1	35.3	20.2	9.4	45.6	22.6	16.7	40.5	37.4		47.5	43.1	32.0
Progression Factor	1.00	1.00	1.00	1.27	0.67	0.67	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	11.1	0.0	13.6	2.0	0.1	0.6	0.9		23.7	0.2	0.1
Delay (s)	36.5	31.3	9.4	71.6	17.2	11.3	41.0	38.3		71.3	43.4	32.1
Level of Service	D	C	A	E	B	B	D	D		E	D	C
Approach Delay (s)		31.6			21.0			38.8			39.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



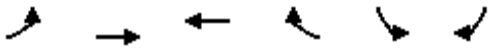
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	2226	213	48	876	18	63	35	24	40	83	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1803		1805	1900	1615
Flt Permitted	0.27	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	515	3610	1615	111	3610	1615		1803		1805	1900	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	55	2394	229	52	942	19	68	38	26	43	89	20
RTOR Reduction (vph)	0	0	10	0	0	6	0	11	0	0	0	18
Lane Group Flow (vph)	55	2394	219	52	942	13	0	121	0	43	89	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2		2	6		6						3
Actuated Green, G (s)	68.7	68.7	68.7	68.7	68.7	68.7		12.0		8.8	8.8	8.8
Effective Green, g (s)	68.7	68.7	68.7	68.7	68.7	68.7		12.0		8.8	8.8	8.8
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.69		0.12		0.09	0.09	0.09
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	353	2480	1109	76	2480	1109		216		158	167	142
v/s Ratio Prot		c0.66			0.26			c0.07		0.02	c0.05	
v/s Ratio Perm	0.11		0.14	0.47		0.01						0.00
v/c Ratio	0.16	0.97	0.20	0.68	0.38	0.01		0.56		0.27	0.53	0.01
Uniform Delay, d1	5.5	14.5	5.7	9.2	6.6	4.9		41.5		42.6	43.6	41.6
Progression Factor	1.60	1.18	1.64	0.80	0.61	0.37		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	8.6	0.3	38.5	0.4	0.0		3.3		0.9	3.2	0.0
Delay (s)	9.4	25.8	9.6	45.9	4.4	1.8		44.8		43.5	46.9	41.7
Level of Service	A	C	A	D	A	A		D		D	D	D
Approach Delay (s)		24.1			6.5			44.8			45.2	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1876	407	256	810	23	93	5	137	23	7	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	3502	1624		1805	1664	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	3502	1624		1805	1664	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	2039	442	278	880	25	101	5	149	25	8	39
RTOR Reduction (vph)	0	0	44	0	0	8	0	135	0	0	37	0
Lane Group Flow (vph)	25	2039	398	278	880	17	101	19	0	25	10	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	3.3	57.4	57.4	15.4	69.5	69.5	4.6	9.1		1.6	6.1	
Effective Green, g (s)	3.3	57.4	57.4	15.4	69.5	69.5	4.6	9.1		1.6	6.1	
Actuated g/C Ratio	0.03	0.57	0.57	0.15	0.70	0.70	0.05	0.09		0.02	0.06	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	59	2072	927	277	2508	1122	161	147		28	101	
v/s Ratio Prot	0.01	c0.56		c0.15	0.24		c0.03	c0.01		0.01	0.01	
v/s Ratio Perm			0.25			0.01						
v/c Ratio	0.42	0.98	0.43	1.00	0.35	0.02	0.63	0.13		0.89	0.10	
Uniform Delay, d1	47.4	20.9	12.0	42.3	6.2	4.7	46.9	41.8		49.1	44.4	
Progression Factor	0.91	1.12	1.51	0.83	0.62	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	9.1	0.6	53.0	0.4	0.0	7.4	0.4		123.8	0.4	
Delay (s)	45.2	32.4	18.8	87.9	4.2	4.7	54.3	42.2		172.9	44.8	
Level of Service	D	C	B	F	A	A	D	D		F	D	
Approach Delay (s)		30.1			23.9			47.0			89.3	
Approach LOS		C			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	61	1998	951	0	899	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.24	1.00	1.00		0.95	1.00
Satd. Flow (perm)	447	3610	3610		3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	66	2172	1034	0	977	150
RTOR Reduction (vph)	0	0	0	0	0	86
Lane Group Flow (vph)	66	2172	1034	0	977	64
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	66.5	66.5	66.5		26.0	26.0
Effective Green, g (s)	66.5	66.5	66.5		26.0	26.0
Actuated g/C Ratio	0.66	0.66	0.66		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	297	2400	2400		910	419
v/s Ratio Prot		c0.60	0.29		c0.28	
v/s Ratio Perm	0.15					0.04
v/c Ratio	0.22	0.91	0.43		1.07	0.15
Uniform Delay, d1	6.6	14.1	7.9		37.0	28.5
Progression Factor	0.70	1.45	1.21		0.83	1.05
Incremental Delay, d2	0.8	3.2	0.5		50.6	0.2
Delay (s)	5.4	23.6	10.1		81.3	30.2
Level of Service	A	C	B		F	C
Approach Delay (s)		23.1	10.1		74.5	
Approach LOS		C	B		E	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2454	418	75	1219	277	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	117	5187	3502	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	2639	449	81	1311	298	110
RTOR Reduction (vph)	0	35	0	0	0	3
Lane Group Flow (vph)	2639	414	81	1311	298	107
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	65.0	65.0	65.0	65.0	27.0	27.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	27.0	27.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2346	1049	76	3371	945	436
v/s Ratio Prot	c0.73			0.25	c0.09	
v/s Ratio Perm		0.26	0.69			0.07
v/c Ratio	1.12	0.39	1.07	0.39	0.32	0.25
Uniform Delay, d1	17.5	8.2	17.5	8.2	29.1	28.5
Progression Factor	0.94	1.08	1.00	1.00	1.00	1.00
Incremental Delay, d2	58.5	0.4	122.4	0.3	0.9	1.3
Delay (s)	75.0	9.3	139.9	8.5	30.0	29.9
Level of Service	E	A	F	A	C	C
Approach Delay (s)	65.5			16.2	30.0	
Approach LOS	E			B	C	

Intersection Summary			
HCM 2000 Control Delay	48.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1025	219	15	592	235	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1079	231	16	623	247	14
RTOR Reduction (vph)	0	79	0	0	0	11
Lane Group Flow (vph)	1079	152	16	623	247	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4
Actuated Green, G (s)	66.0	66.0	3.0	73.0	19.0	19.0
Effective Green, g (s)	66.0	66.0	3.0	73.0	19.0	19.0
Actuated g/C Ratio	0.66	0.66	0.03	0.73	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2382	1065	54	2635	342	306
v/s Ratio Prot	c0.30		0.01	c0.17	c0.14	
v/s Ratio Perm		0.09				0.00
v/c Ratio	0.45	0.14	0.30	0.24	0.72	0.01
Uniform Delay, d1	8.2	6.4	47.5	4.4	38.0	32.9
Progression Factor	0.85	0.46	0.98	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.3	2.9	0.2	7.3	0.0
Delay (s)	7.5	3.2	49.5	4.6	45.4	32.9
Level of Service	A	A	D	A	D	C
Approach Delay (s)	6.8			5.7	44.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	1242	40	4	823	6	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1307	42	4	866	6	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	350			324		
pX, platoon unblocked			0.89		0.92	0.89
vC, conflicting volume			1349		1749	654
vC1, stage 1 conf vol					1307	
vC2, stage 2 conf vol					442	
vCu, unblocked vol			1149		1370	368
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	100
cM capacity (veh/h)			549		242	566

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NE 1
Volume Total	654	654	42	293	578	8
Volume Left	0	0	0	4	0	6
Volume Right	0	0	42	0	0	2
cSH	1700	1700	1700	549	1700	283
Volume to Capacity	0.38	0.38	0.02	0.01	0.34	0.03
Queue Length 95th (ft)	0	0	0	1	0	2
Control Delay (s)	0.0	0.0	0.0	0.3	0.0	18.1
Lane LOS				A		C
Approach Delay (s)	0.0			0.1		18.1
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX O

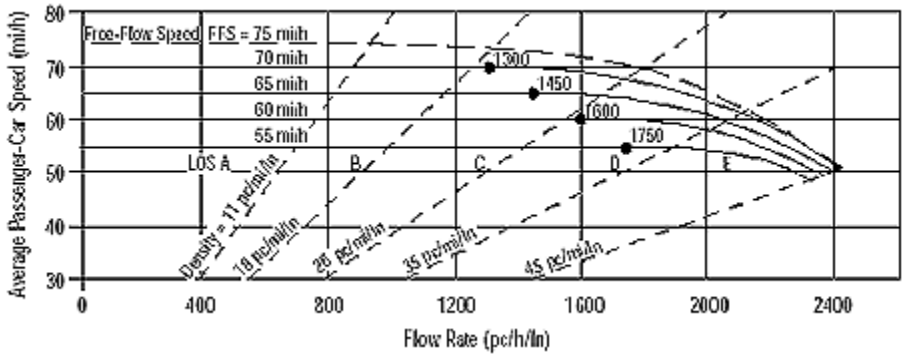
Existing Plus Project Conditions
HCS+ Freeway Segment, HCS+ Ramp Junction,
and Queuing Analysis Worksheets

HCS+ Freeway Segment Analysis Worksheets

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I-605 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*South of Live Oak Ave*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6254*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1759*	pc/h/ln
S	*68.3*	mi/h
D = v_p / S	*25.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

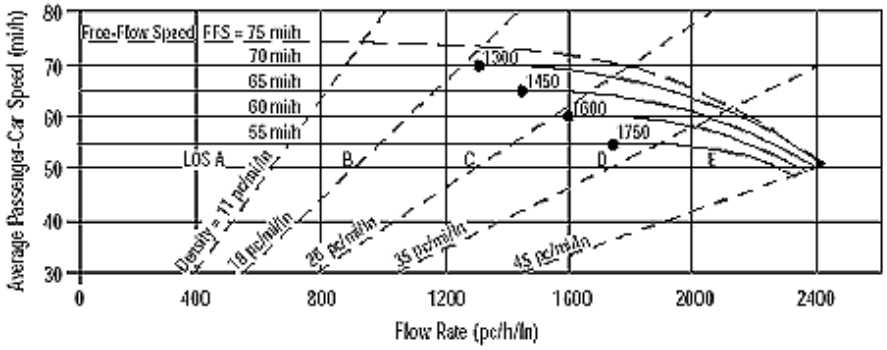
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4919*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1383*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*19.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

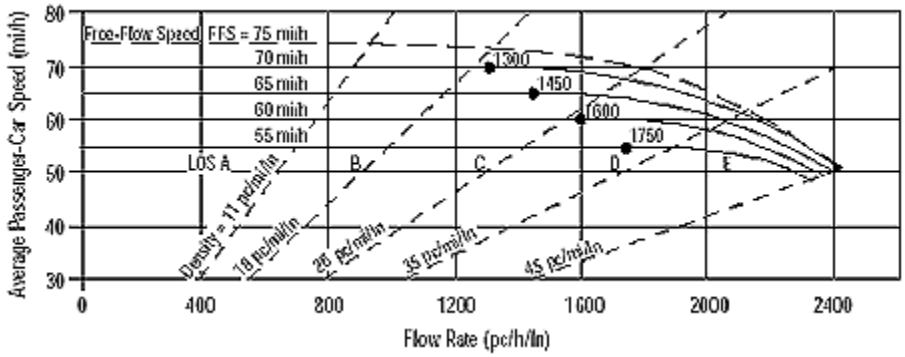
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5167*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1453*	pc/h/ln
S	*69.9*	mi/h
D = v_p / S	*20.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

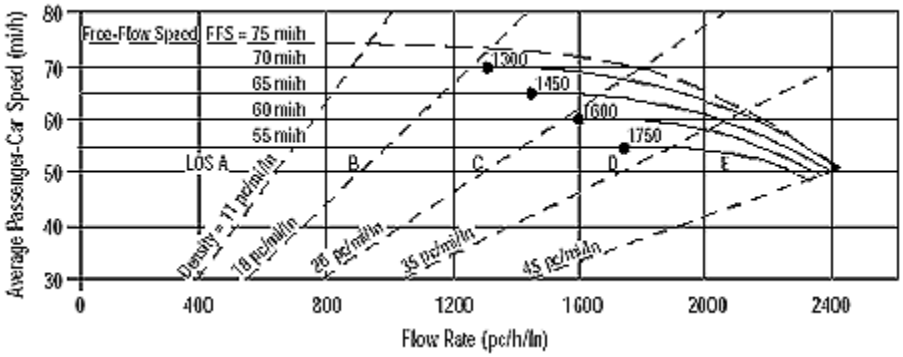
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DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5753*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1618*	pc/h/ln
S	*69.3*	mi/h
D = v_p / S	*23.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

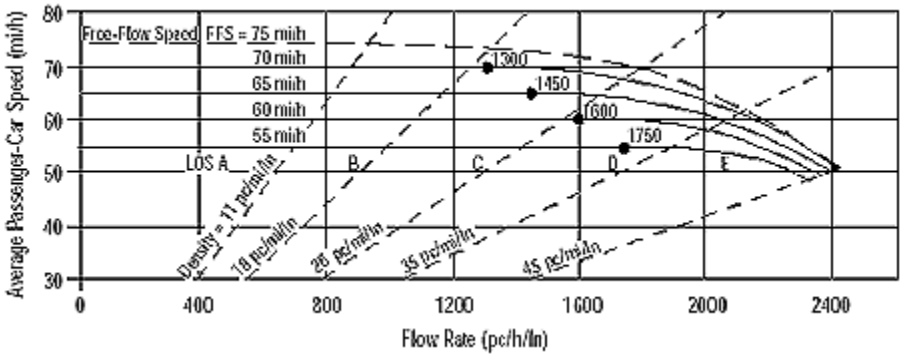
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Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4628*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1302*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*18.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

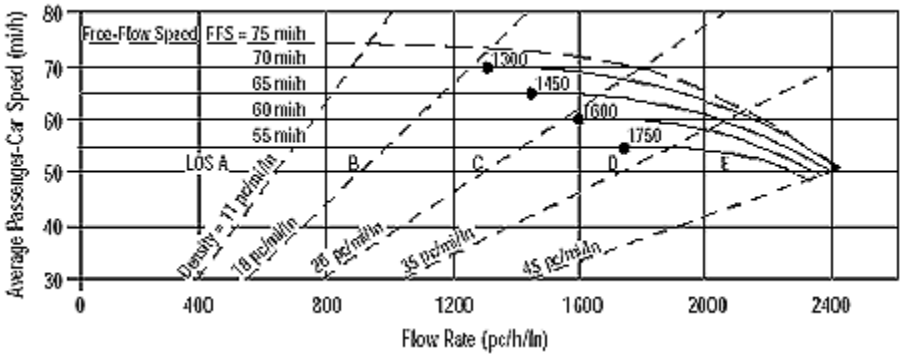
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3655*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1028*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*14.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

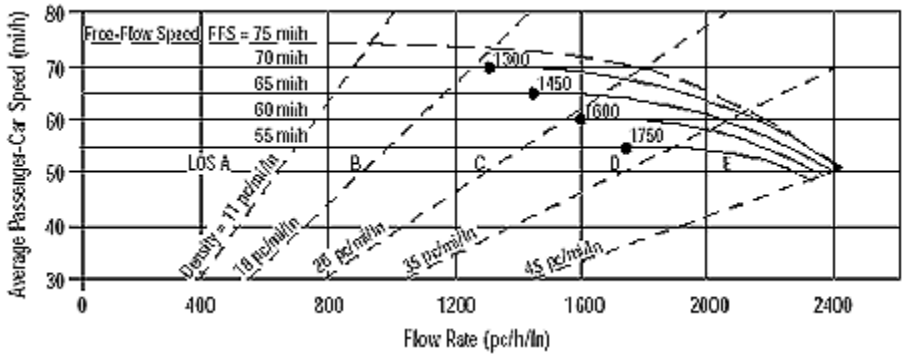
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2013)*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5025*	veh/h	Peak-Hour Factor, PHF	
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1413*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*20.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

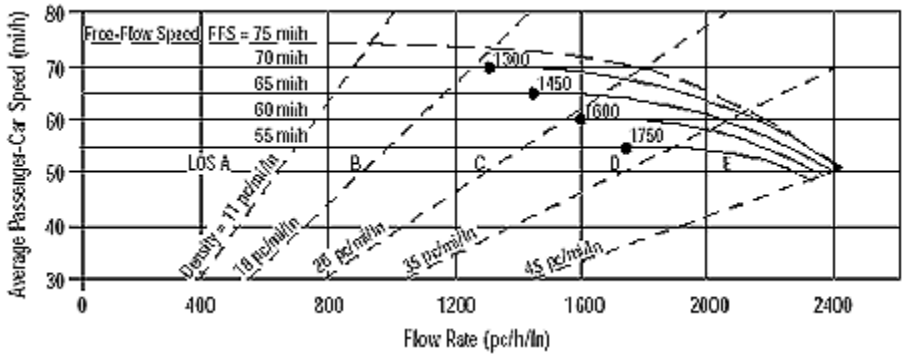
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V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5139*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1445*	pc/h/ln
S	*69.9*	mi/h
D = v_p / S	*20.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

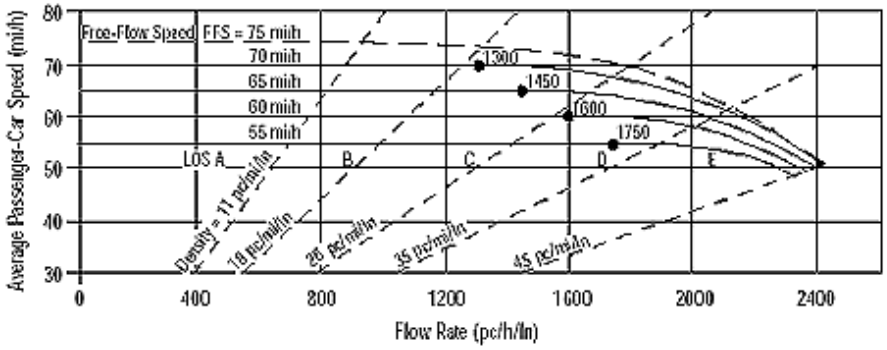
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DDHV - Directional design hour volume	

Factor Location

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f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6131*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1724*	pc/h/ln
S	*68.6*	mi/h
D = v_p / S	*25.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

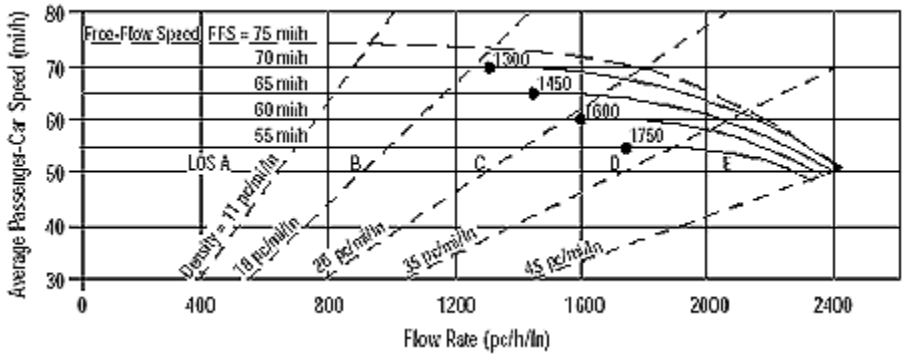
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4751*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1336*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*19.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

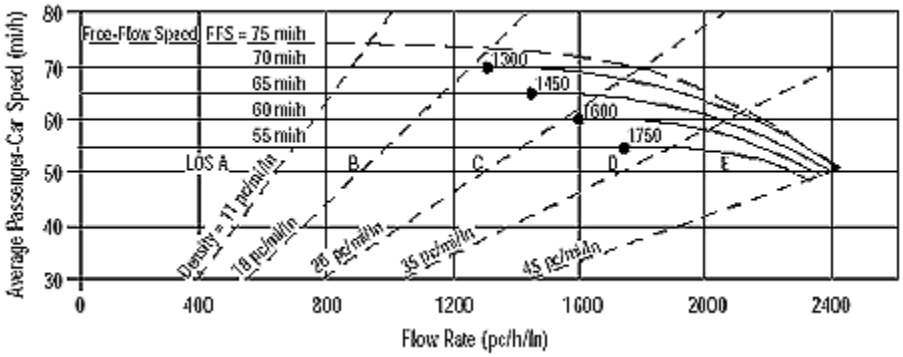
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4874*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1371*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*19.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

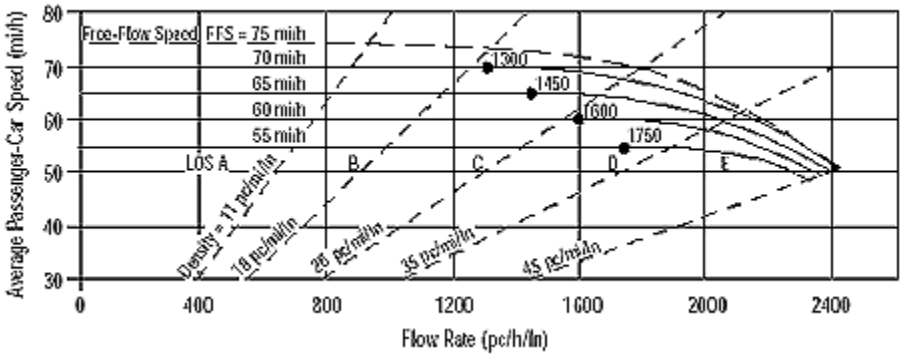
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4809*	veh/h	Peak-Hour Factor, PHF	*0.92*	
AADT		veh/day	%Trucks and Buses, P_T	*7*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1353*	pc/h/ln	Design LOS		
S	*70.0*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*19.3*	pc/mi/ln	S		mi/h
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

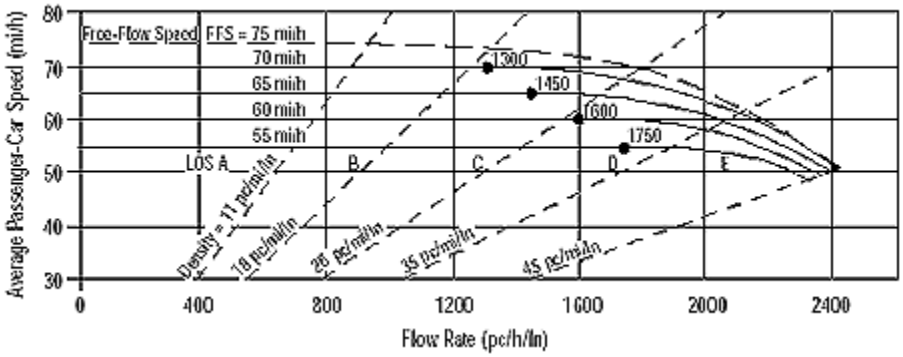
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4166*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1172*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*16.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

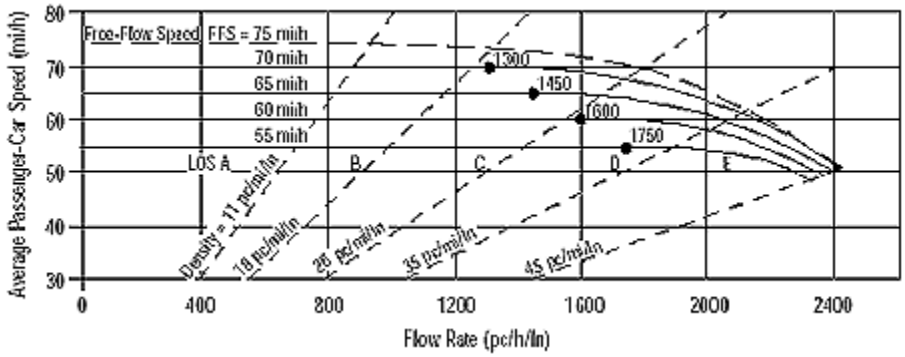
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5839*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1642*	pc/h/ln
S	*69.2*	mi/h
D = v_p / S	*23.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

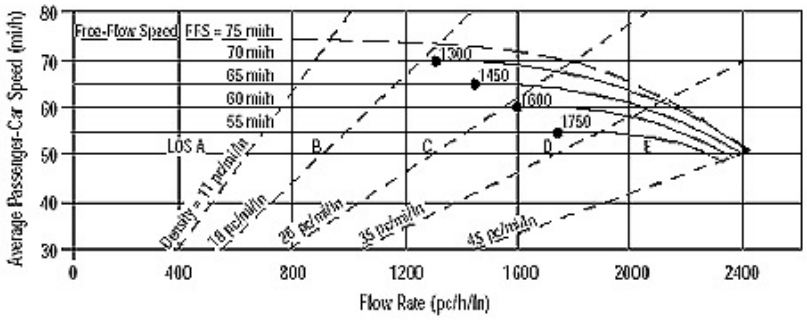
Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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I-210 Freeway

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7039*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

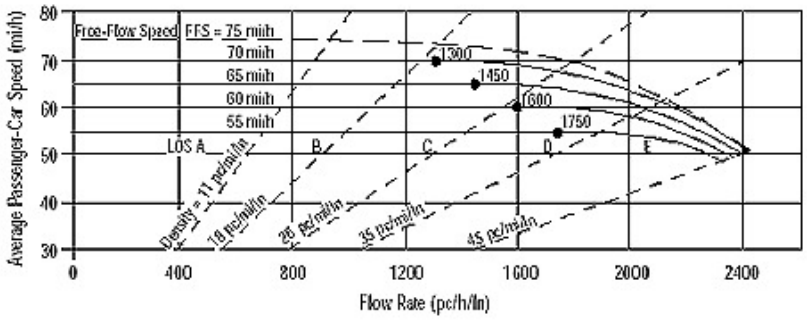
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1980*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*65.2*	mi/h	S	mi/h
D = v_p / S	*30.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*6435*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

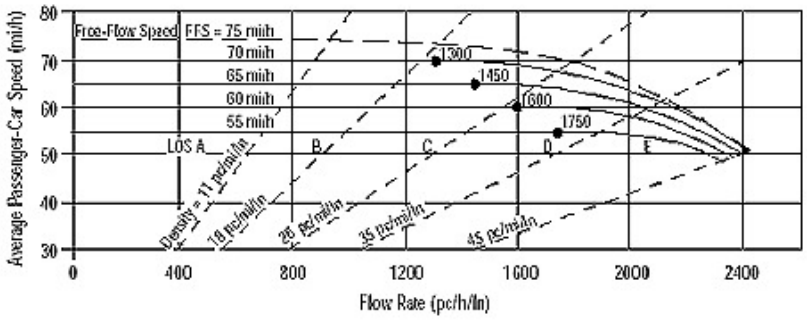
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1810*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*67.7*	mi/h	S		mi/h
D = v_p / S	*26.7*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7436*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

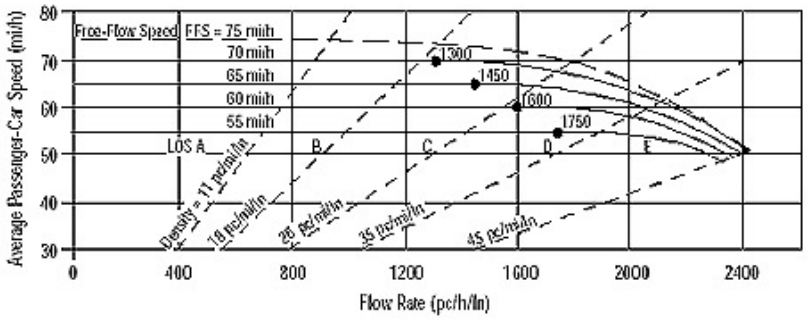
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2091*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*62.9*	mi/h	S		mi/h
D = v_p / S	*33.2*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7573*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

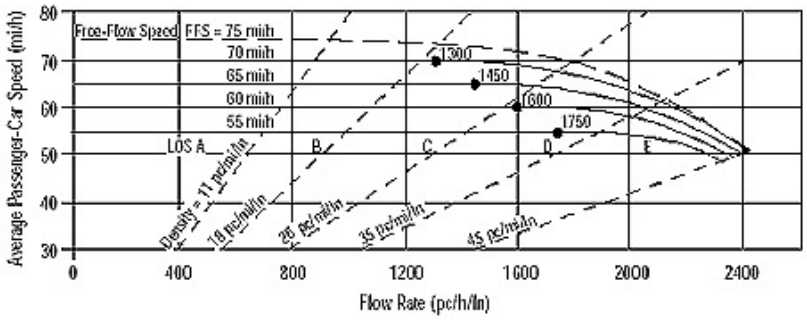
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2130*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*62.0*	mi/h	S	mi/h
D = v_p / S	*34.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6034*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

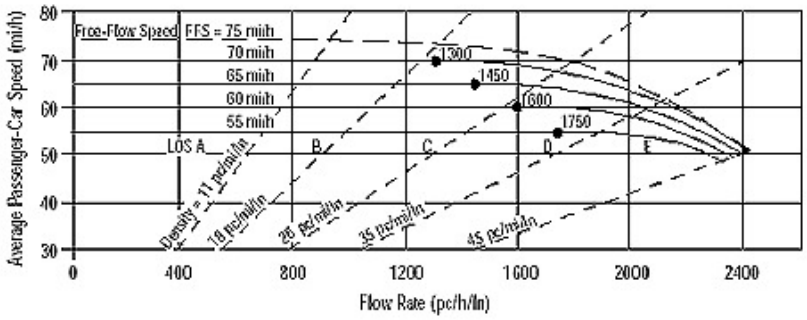
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1697*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*68.8*	mi/h	S		mi/h
D = v_p / S	*24.7*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*C*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*6523*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

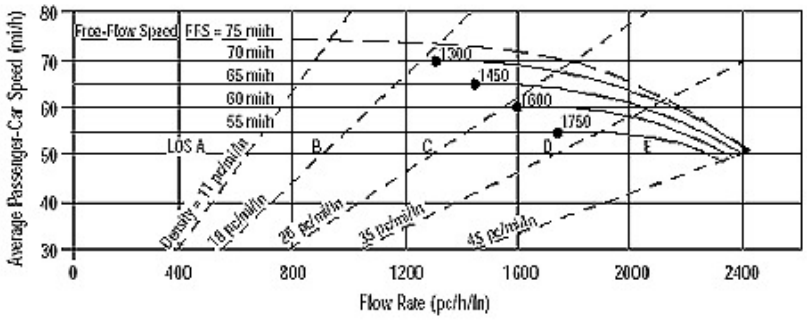
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1835*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*67.4*	mi/h	S	mi/h
D = v_p / S	*27.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7110*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

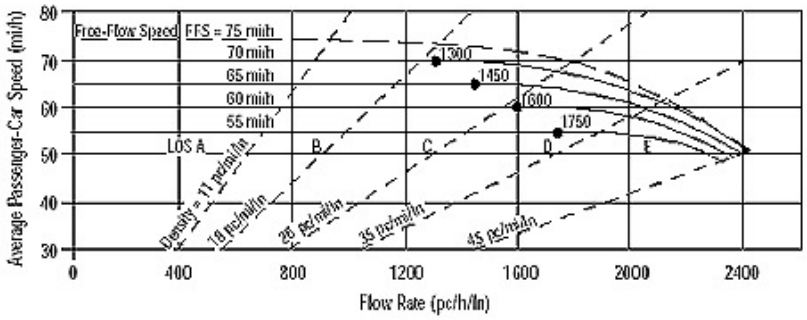
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2000*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*64.9*	mi/h	S		mi/h
D = v_p / S	*30.8*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*BW Irwindale Off & Loop OnRamp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6582*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1851*	pc/h/ln
S	*67.2*	mi/h
D = v_p / S	*27.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

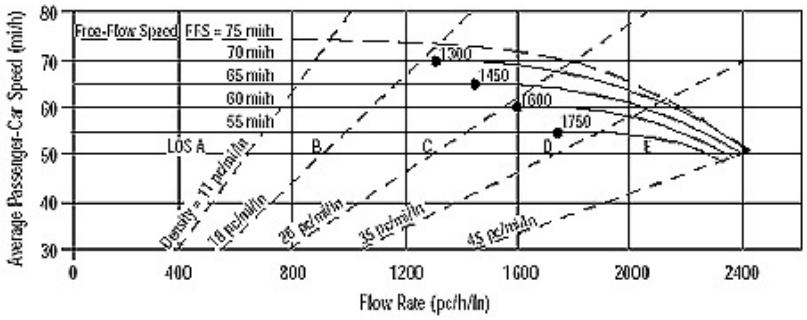
Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7313*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

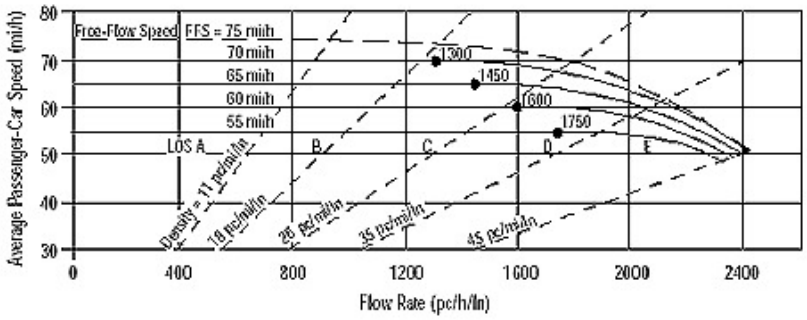
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2057*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*63.7*	mi/h	S	mi/h
D = v_p / S	*32.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7221*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

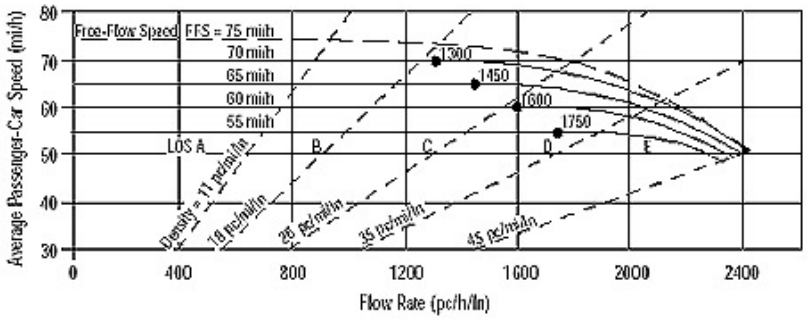
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2031*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.2*	mi/h	S	mi/h
D = v_p / S	*31.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*6399*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

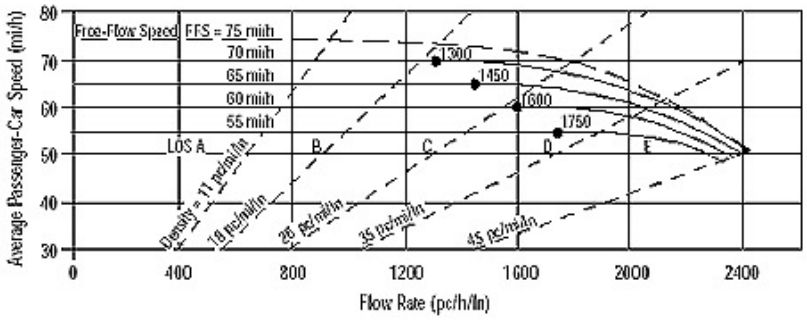
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1800*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*67.9*	mi/h	S		mi/h
D = v_p / S	*26.5*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7303*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2054*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*63.8*	mi/h	S		mi/h
D = v_p / S	*32.2*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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HCS+ Ramp Junction Analysis Worksheets

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I-605 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 248 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6254	0.92	Level	7	0	0.966	1.00	7036
Ramp	1335	0.92	Level	0	0	1.000	1.00	1451
UpStream								
DownStream	248	0.92	Level	0	0	1.000	1.00	270

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3886 pc/h
V_3 or V_{av34} 1575 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7036	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5585	Exhibit 25-14	9600	No
V_R	1451	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3886	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 35.3 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.559 (Exhibit 25-19)
S_R= 54.4 mph (Exhibit 25-19)
S_0= 74.5 mph (Exhibit 25-19)
S = 61.9 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 586 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4919	0.92	Level	7	0	0.966	1.00	5534
Ramp	248	0.92	Level	0	0	1.000	1.00	270
UpStream								
DownStream	586	0.92	Level	0	0	1.000	1.00	637

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.407 using Equation (Exhibit 25-5)

V_{12} = 2253 pc/h

V_3 or V_{av34} 1640 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5804	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2523	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 20.6 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.321 (Exibit 25-19)

S_R= 61.0 mph (Exhibit 25-19)

S_0= 65.9 mph (Exhibit 25-19)

S = 63.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1000 ft

V_u = 248 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5167	0.92	Level	7	0	0.966	1.00	5813
Ramp	586	0.92	Level	0	0	1.000	1.00	637
UpStream	248	0.92	Level	0	0	1.000	1.00	270
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.371 using Equation (Exhibit 25-5)

V_{12} = 2155 pc/h

V_3 or V_{av34} 1829 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2325 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6450	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2962	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 23.7 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.345 (Exibit 25-19)

S_R = 60.3 mph (Exhibit 25-19)

S_0 = 65.5 mph (Exhibit 25-19)

S = 63.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1484 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4628	0.92	Level	7	0	0.966	1.00	5206
Ramp	973	0.92	Level	0	0	1.000	1.00	1058
UpStream								
DownStream	1484	0.92	Level	0	0	1.000	1.00	1613

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 2867 pc/h
V_3 or V_{av34} 1169 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5206	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	4148	Exhibit 25-14	9600	No
V_R	1058	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2867	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 26.8 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.523 (Exhibit 25-19)
S_R = 55.3 mph (Exhibit 25-19)
S_0 = 76.1 mph (Exhibit 25-19)
S = 63.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 973 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3655	0.92	Level	7	0	0.966	1.00	4112
Ramp	1484	0.92	Level	0	0	1.000	1.00	1613
UpStream	973	0.92	Level	0	0	1.000	1.00	1058
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.239 using Equation (Exhibit 25-5)

V_{12} = 983 pc/h

V_3 or V_{av34} 1564 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1644 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5725	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3257	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 25.7 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.373 (Exibit 25-19)

S_R = 59.5 mph (Exhibit 25-19)

S_0 = 67.4 mph (Exhibit 25-19)

S = 62.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 123 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6131	0.92	Level	7	0	0.966	1.00	6897
Ramp	1380	0.92	Level	0	0	1.000	1.00	1500
UpStream								
DownStream	123	0.92	Level	0	0	1.000	1.00	134

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3853 pc/h
V_3 or V_{av34} 1522 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6897	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5397	Exhibit 25-14	9600	No
V_R	1500	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3853	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 35.0 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.563 (Exhibit 25-19)
S_R = 54.2 mph (Exhibit 25-19)
S_0 = 74.8 mph (Exhibit 25-19)
S = 61.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 438 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4751	0.92	Level	7	0	0.966	1.00	5345
Ramp	123	0.92	Level	0	0	1.000	1.00	134
UpStream								
DownStream	438	0.92	Level	0	0	1.000	1.00	476

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.424 using Equation (Exhibit 25-5)

V_{12} = 2267 pc/h

V_3 or V_{av34} 1539 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5479	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2401	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 19.8 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

M_S = 0.315 (Exibit 25-19)

S_R= 61.2 mph (Exhibit 25-19)

S_0= 66.3 mph (Exhibit 25-19)

S = 63.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1000 ft

V_u = 123 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4874	0.92	Level	7	0	0.966	1.00	5483
Ramp	438	0.92	Level	0	0	1.000	1.00	476
UpStream	123	0.92	Level	0	0	1.000	1.00	134
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.391 using Equation (Exhibit 25-5)

V_{12} = 2143 pc/h

V_3 or V_{av34} 1670 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2193 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5959	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2669	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 21.5 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.326 (Exibit 25-19)

S_R = 60.9 mph (Exhibit 25-19)

S_0 = 65.9 mph (Exhibit 25-19)

S = 63.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1673 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4809	0.92	Level	7	0	0.966	1.00	5410
Ramp	643	0.92	Level	0	0	1.000	1.00	699
UpStream								
DownStream	1673	0.92	Level	0	0	1.000	1.00	1818

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 2753 pc/h
V_3 or V_{av34} 1328 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5410	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	4711	Exhibit 25-14	9600	No
V_R	699	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2753	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 25.9 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.491 (Exhibit 25-19)
S_R= 56.3 mph (Exhibit 25-19)
S_0= 75.5 mph (Exhibit 25-19)
S = 64.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 643 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4166	0.92	Level	7	0	0.966	1.00	4687
Ramp	1673	0.92	Level	0	0	1.000	1.00	1818
UpStream	643	0.92	Level	0	0	1.000	1.00	699
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.214 using Equation (Exhibit 25-5)

V_{12} = 1001 pc/h

V_3 or V_{av34} 1843 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1874 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6505	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3692	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 29.0 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.428 (Exibit 25-19)

S_R = 58.0 mph (Exhibit 25-19)

S_0 = 66.7 mph (Exhibit 25-19)

S = 61.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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I-210 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7039	0.92	Level	7	0	0.966	1.00	7919
Ramp	604	0.92	Level	0	0	1.000	1.00	657
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 3823 pc/h

V_3 or V_{av34} 2048 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7919	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7262	Exhibit 25-14	9600	No
V_R	657	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3823	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 33.5 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.487 (Exhibit 25-19)

S_R = 56.4 mph (Exhibit 25-19)

S_0 = 72.7 mph (Exhibit 25-19)

S = 63.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6435	0.92	Level	7	0	0.966	1.00	7239
Ramp	540	0.92	Level	0	0	1.000	1.00	587
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.304 using Equation (Exhibit 25-5)

V_{12} = 2199 pc/h

V_3 or V_{av34} 2520 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2895 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7826	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3482	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.2 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.413 (Exibit 25-19)

S_R = 58.4 mph (Exhibit 25-19)

S_0 = 64.0 mph (Exhibit 25-19)

S = 61.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6975	0.92	Level	7	0	0.966	1.00	7847
Ramp	461	0.92	Level	0	0	1.000	1.00	501
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.378 using Equation (Exhibit 25-5)
V_{12} = 2968 pc/h
V_3 or V_{av34} 2439 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3138 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8348	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3639	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = 29.2 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.420 (Exibit 25-19)
S_R = 58.2 mph (Exhibit 25-19)
S_0 = 63.1 mph (Exhibit 25-19)
S = 60.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7573	0.92	Level	7	0	0.966	1.00	8520
Ramp	1539	0.92	Level	0	0	1.000	1.00	1673
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 3453 pc/h

V_3 or V_{av34} 2533 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8520	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6847	Exhibit 25-14	9600	No
V_R	1673	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3453	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 22.2 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.579 (Exhibit 25-19)

S_R = 53.8 mph (Exhibit 25-19)

S_0 = 70.8 mph (Exhibit 25-19)

S = 62.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6034	0.92	Level	7	0	0.966	1.00	6788
Ramp	489	0.92	Level	0	0	1.000	1.00	532
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.438 using Equation (Exhibit 25-5)

V_{12} = 2973 pc/h

V_3 or V_{av34} 1907 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7320	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3505	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.9 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.388 (Exibit 25-19)

S_R = 59.1 mph (Exhibit 25-19)

S_0 = 64.9 mph (Exhibit 25-19)

S = 62.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7110	0.92	Level	7	0	0.966	1.00	7999
Ramp	528	0.92	Level	0	0	1.000	1.00	574
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 3811 pc/h

V_3 or V_{av34} 2094 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7999	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7425	Exhibit 25-14	9600	No
V_R	574	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3811	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 33.4 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.480 (Exhibit 25-19)

S_R = 56.6 mph (Exhibit 25-19)

S_0 = 72.5 mph (Exhibit 25-19)

S = 63.9 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6582	0.92	Level	7	0	0.966	1.00	7405
Ramp	448	0.92	Level	0	0	1.000	1.00	487
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.316 using Equation (Exhibit 25-5)

V_{12} = 2342 pc/h

V_3 or V_{av34} 2531 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2962 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7892	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3449	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.0 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.409 (Exibit 25-19)

S_R = 58.6 mph (Exhibit 25-19)

S_0 = 63.8 mph (Exhibit 25-19)

S = 61.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7030	0.92	Level	7	0	0.966	1.00	7909
Ramp	283	0.92	Level	0	0	1.000	1.00	308
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.402 using Equation (Exhibit 25-5)
V_{12} = 3182 pc/h
V_3 or V_{av34} 2363 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8217	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3490	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.2 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.400 (Exibit 25-19)
S_R = 58.8 mph (Exhibit 25-19)
S_0 = 63.1 mph (Exhibit 25-19)
S = 61.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7221	0.92	Level	7	0	0.966	1.00	8124
Ramp	822	0.92	Level	0	0	1.000	1.00	893
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 2773 pc/h

V_3 or V_{av34} 2675 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3249 pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8124	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7231	Exhibit 25-14	9600	No
V_R	893	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2773	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 20.5 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.508 (Exhibit 25-19)

S_R = 55.8 mph (Exhibit 25-19)

S_0 = 71.2 mph (Exhibit 25-19)

S = 64.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6399	0.92	Level	7	0	0.966	1.00	7199
Ramp	904	0.92	Level	0	0	1.000	1.00	983
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.382 using Equation (Exhibit 25-5)
V_{12} = 2747 pc/h
V_3 or V_{av34} 2226 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes,V_{12a} = 2879 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8182	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3862	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.5 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.443 (Exibit 25-19)
S_R= 57.6 mph (Exhibit 25-19)
S_0= 64.0 mph (Exhibit 25-19)
S = 60.8 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

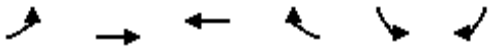
D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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Queuing Analysis Worksheets

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3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Volume (vph)	0	435	1279	0	541	432
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Satd. Flow (RTOR)						444
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	500	1470	0	622	497
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	500	1470	0	622	497
v/c Ratio		0.19	0.80		1.04	0.31
Control Delay		8.3	16.5		71.5	0.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.3	16.5		71.5	0.5
Queue Length 50th (ft)		32	213		~251	0
Queue Length 95th (ft)		46	277		#404	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2636	1835		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.19	0.80		1.04	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



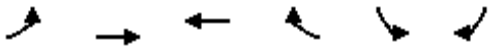
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	283	567	917	1311	0	0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Satd. Flow (RTOR)		457				
Peak Hour Factor	0.94	0.94	0.94	0.94	1.00	1.00
Adj. Flow (vph)	301	603	976	1395	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	301	603	976	1395	0	0
v/c Ratio	0.29	0.37	1.03	0.39		
Control Delay	17.1	0.7	54.0	0.3		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	17.1	0.7	54.0	0.3		
Queue Length 50th (ft)	43	0	~400	0		
Queue Length 95th (ft)	71	0	#611	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	943	3570		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.28	0.37	1.03	0.39		

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW	NW
Directions Served	R	R	T	T
Maximum Queue (ft)	459	374	129	98
Average Queue (ft)	459	373	26	23
95th Queue (ft)	459	377	111	86
Link Distance (ft)	444	359	98	98
Upstream Blk Time (%)	89	81	1	0
Queuing Penalty (veh)	0	0	4	1
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	814	332	0	413	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						261
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	925	377	0	469	261
v/c Ratio		0.34	0.20		0.85	0.16
Control Delay		8.7	8.1		35.3	0.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.7	8.1		35.3	0.2
Queue Length 50th (ft)		67	36		150	0
Queue Length 95th (ft)		89	55		#278	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2761	1922		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.34	0.20		0.78	0.16

Intersection Summary	
Area Type:	Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	907	946	727	878	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		499				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	955	996	765	924	0	0
v/c Ratio	0.88	0.62	0.82	0.26		
Control Delay	31.9	1.8	21.6	0.2		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	31.9	1.8	21.6	0.2		
Queue Length 50th (ft)	171	0	214	0		
Queue Length 95th (ft)	#275	0	#423	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.88	0.62	0.82	0.26		

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB
Directions Served	R	R
Maximum Queue (ft)	459	374
Average Queue (ft)	459	351
95th Queue (ft)	459	429
Link Distance (ft)	444	359
Upstream Blk Time (%)	95	76
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

APPENDIX P

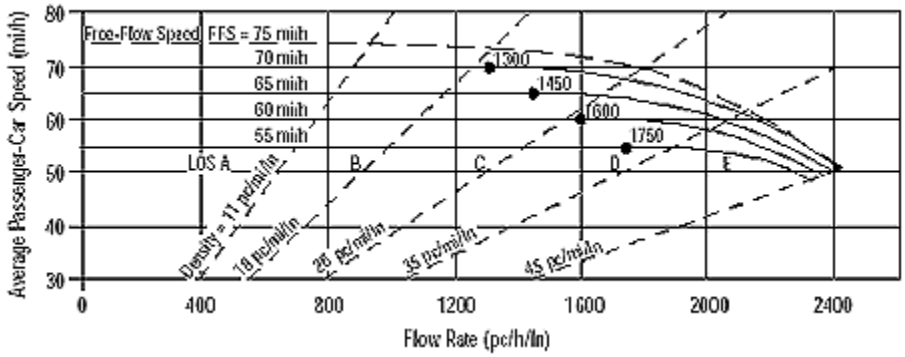
Interim Year (2016) Without Project
HCS+ Freeway Segment, HCS+ Ramp Junction,
and Queuing Analysis Worksheets

HCS+ Freeway Segment Analysis Worksheets

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I-605 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6749*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1898*	pc/h/ln
S	*66.6*	mi/h
D = v_p / S	*28.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

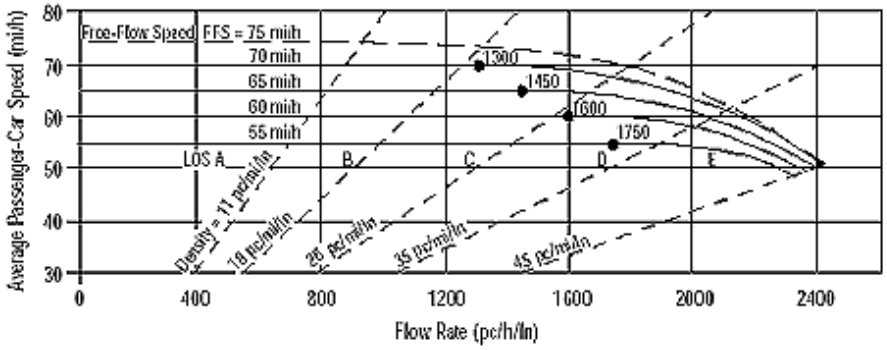
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5406*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1520*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*21.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

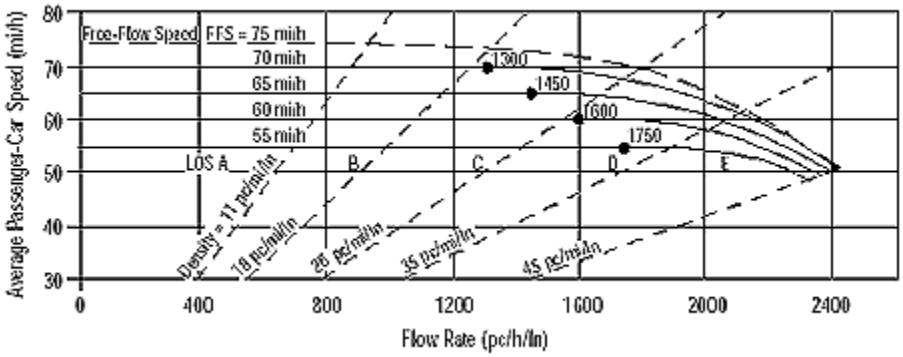
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW EB Arrw Lp On and WB On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5669*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

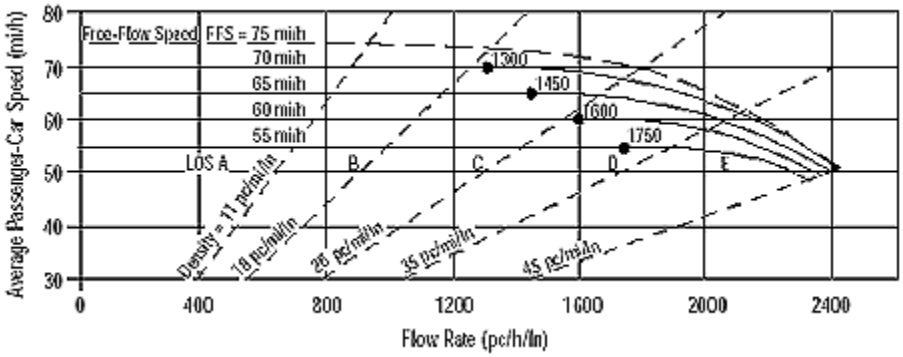
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1594*	pc/h/ln	Design LOS		
S	*69.5*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*22.9*	pc/mi/ln	S		mi/h
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6168*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1735*	pc/h/ln
S	*68.5*	mi/h
D = v_p / S	*25.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

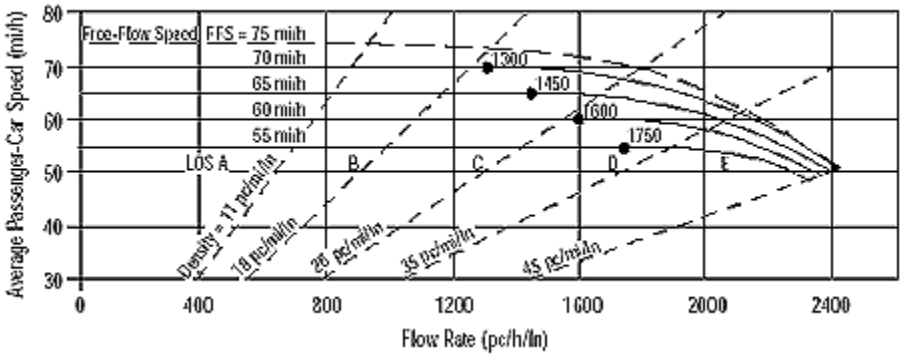
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5014*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1410*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*20.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

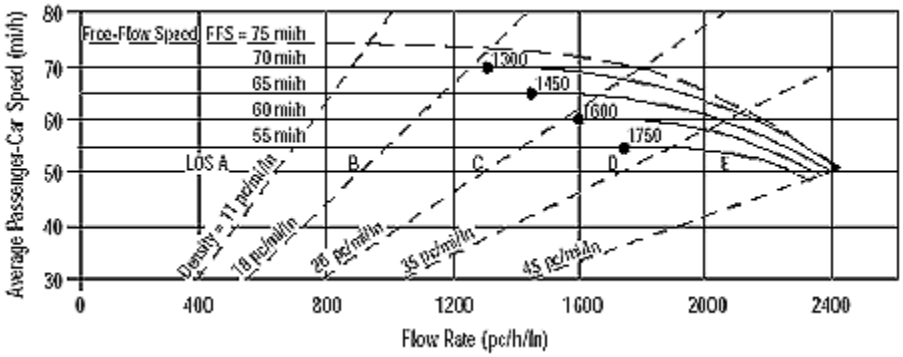
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4102*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1154*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*16.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

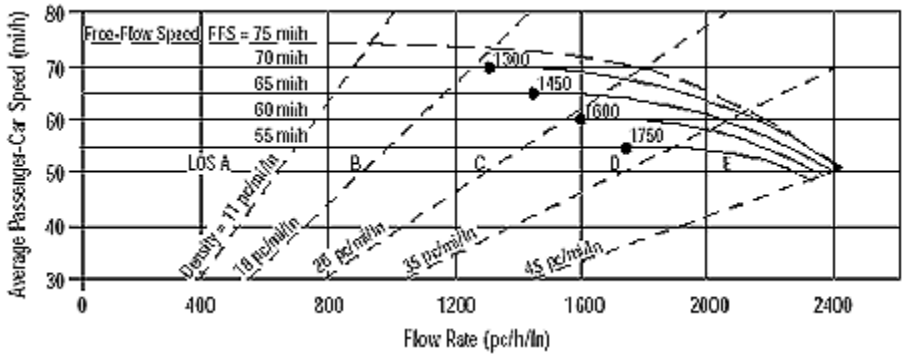
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5606*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1577*	pc/h/ln
S	*69.5*	mi/h
D = v_p / S	*22.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

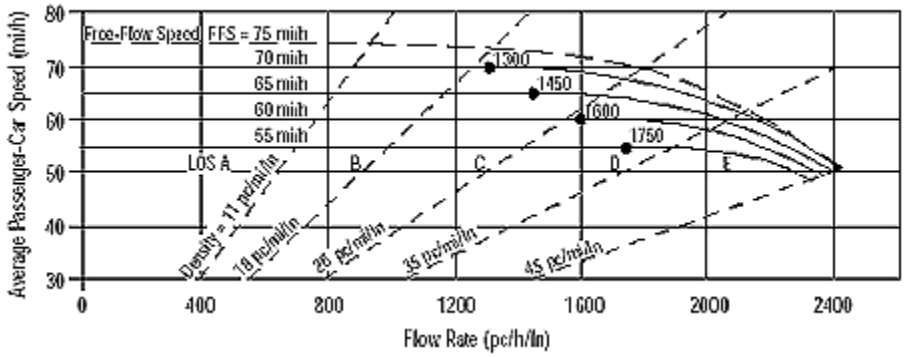
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V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/213*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6686*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1880*	pc/h/ln
S	*66.8*	mi/h
D = v_p / S	*28.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

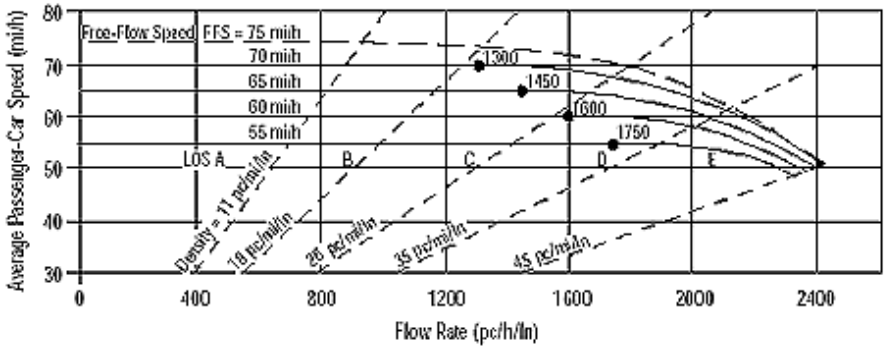
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V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5304*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1492*	pc/h/ln
S	*69.8*	mi/h
D = v_p / S	*21.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

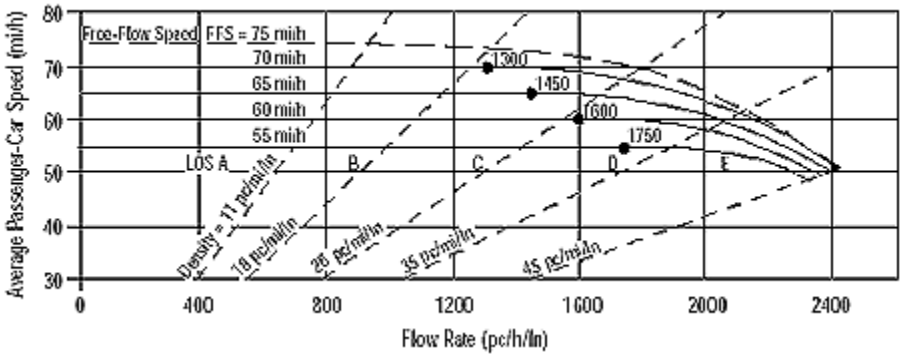
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5437*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1529*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*21.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

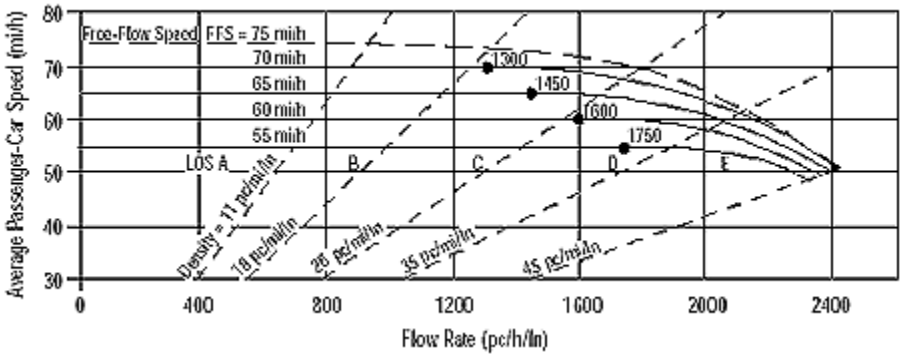
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5799*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1631*	pc/h/ln
S	*69.3*	mi/h
D = v_p / S	*23.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

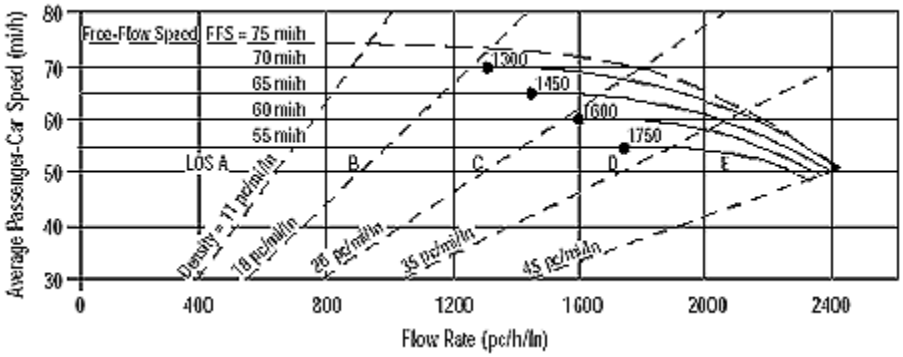
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v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5238*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1473*	pc/h/ln
S	*69.9*	mi/h
D = v_p / S	*21.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

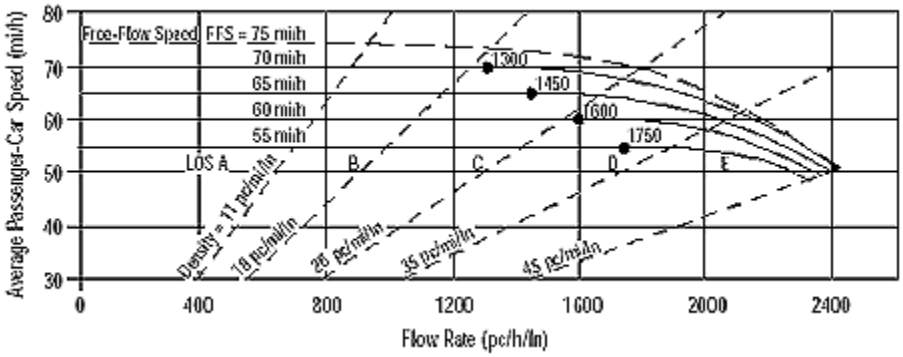
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DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4660*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1311*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*18.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

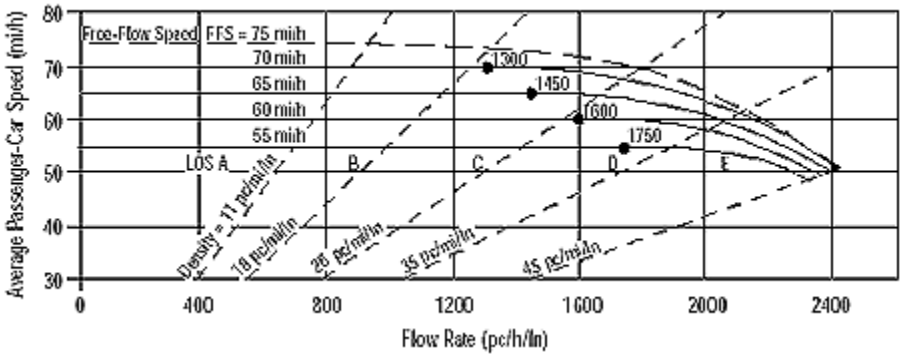
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2016 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6362*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1789*	pc/h/ln
S	*68.0*	mi/h
D = v_p / S	*26.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

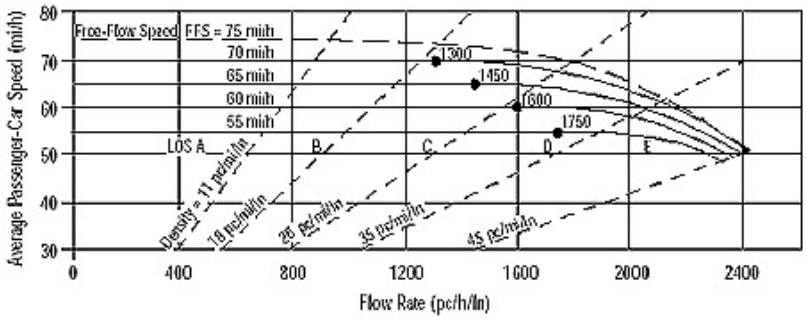
Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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I-210 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7507*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

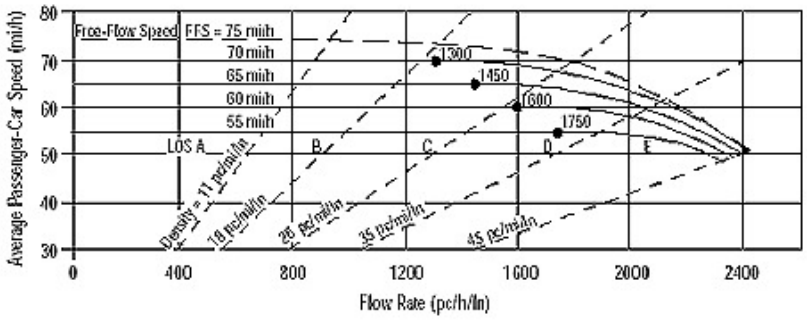
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2111*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*62.5*	mi/h	S	mi/h
D = v_p / S	*33.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*6842*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

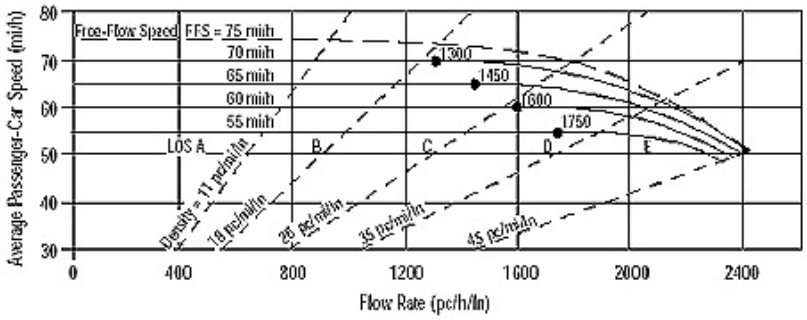
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1924*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*66.2*	mi/h	S		mi/h
D = v_p / S	*29.1*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7924*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

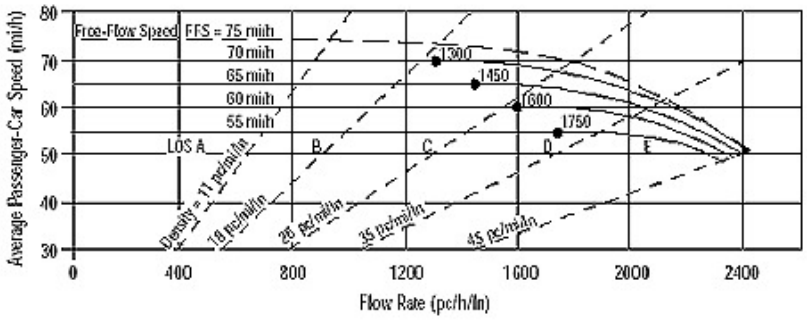
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2229*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*59.3*	mi/h	S	mi/h
D = v_p / S	*37.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8085*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

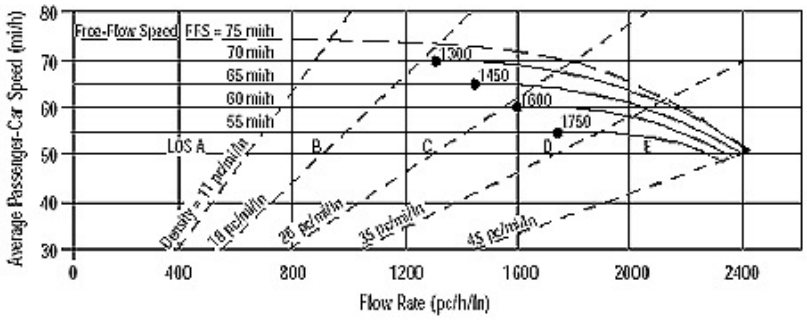
LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2274*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*57.9*	mi/h	S	mi/h
D = v_p / S	*39.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*6423*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

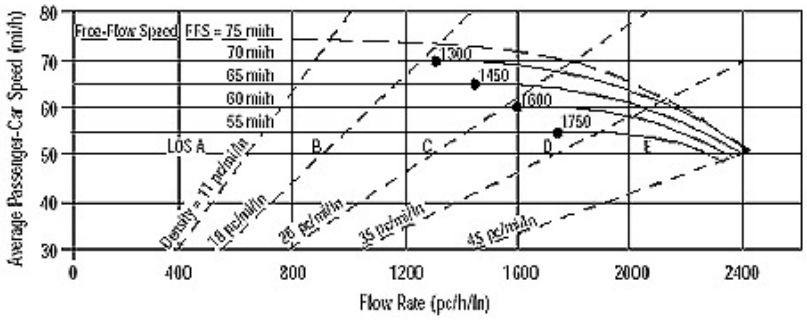
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1806*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*67.8*	mi/h	S	mi/h
D = v_p / S	*26.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6958*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

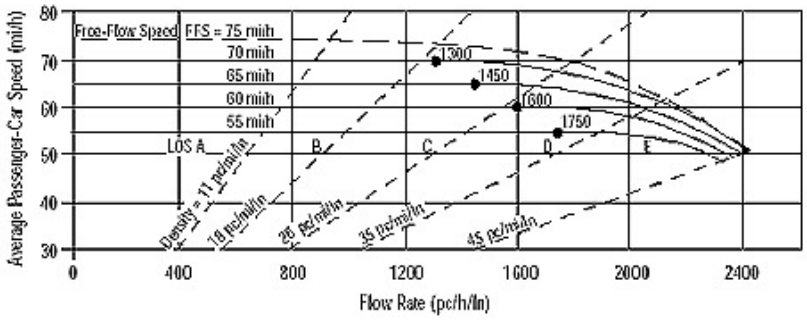
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1957*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*65.6*	mi/h	S	mi/h
D = v_p / S	*29.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7613*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

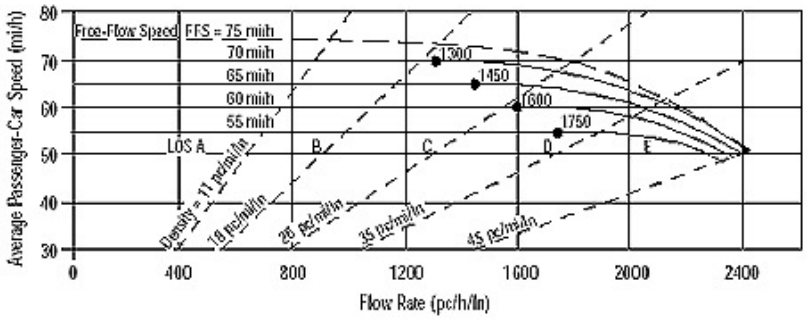
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2141*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*61.7*	mi/h	S		mi/h
D = v_p / S	*34.7*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7034*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

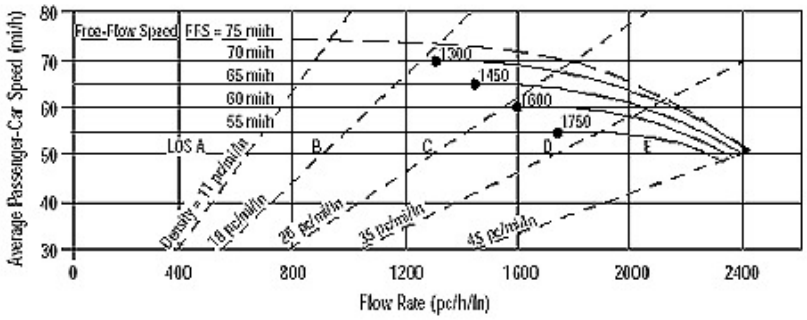
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1978*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*65.3*	mi/h	S		mi/h
D = v_p / S	*30.3*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7834*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

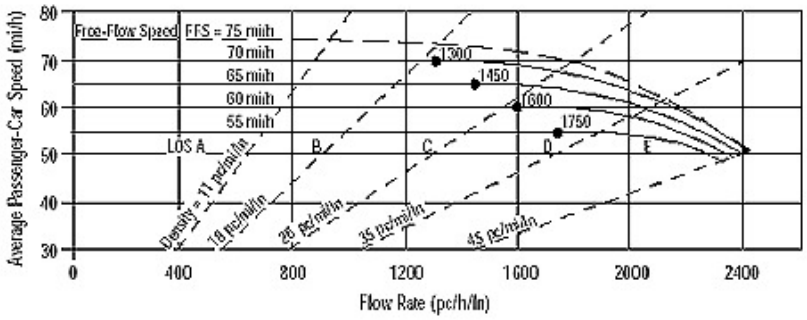
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2203*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*60.0*	mi/h	S	mi/h
D = v_p / S	*36.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7754*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

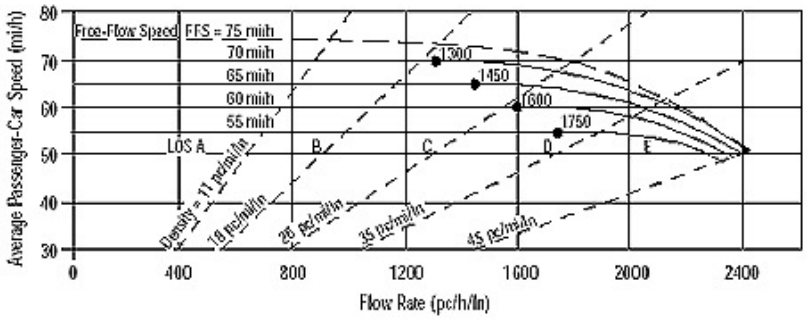
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2181*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*60.6*	mi/h	S	mi/h
D = v_p / S	*36.0*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*6858*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

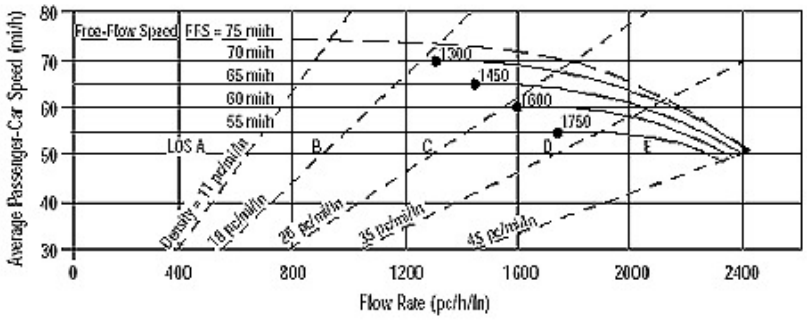
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1929*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*66.1*	mi/h	S	mi/h
D = v_p / S	*29.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7837*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2204*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*60.0*	mi/h	S	mi/h
D = v_p / S	*36.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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HCS+ Ramp Junction Analysis Worksheets

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I-605 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 263 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6749	0.92	Level	7	0	0.966	1.00	7593
Ramp	1343	0.92	Level	0	0	1.000	1.00	1460
UpStream								
DownStream	263	0.92	Level	0	0	1.000	1.00	286

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 4134 pc/h
V_3 or V_{av34} 1729 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7593	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6133	Exhibit 25-14	9600	No
V_R	1460	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4134	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 37.5 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.559 (Exhibit 25-19)
S_R= 54.3 mph (Exhibit 25-19)
S_0= 73.9 mph (Exhibit 25-19)
S = 61.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 499 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5406	0.92	Level	7	0	0.966	1.00	6082
Ramp	263	0.92	Level	0	0	1.000	1.00	286
UpStream								
DownStream	499	0.92	Level	0	0	1.000	1.00	542

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.405 using Equation (Exhibit 25-5)
V_{12} = 2464 pc/h
V_3 or V_{av34} 1809 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6368	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2750	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 22.4 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.333 (Exibit 25-19)
S_R= 60.7 mph (Exhibit 25-19)
S_0= 65.3 mph (Exhibit 25-19)
S = 63.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1000 ft

V_u = 263 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5669	0.92	Level	7	0	0.966	1.00	6378
Ramp	499	0.92	Level	0	0	1.000	1.00	542
UpStream	263	0.92	Level	0	0	1.000	1.00	286
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.383 using Equation (Exhibit 25-5)

V_{12} = 2440 pc/h

V_3 or V_{av34} 1969 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2551 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6920	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3093	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 24.8 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.356 (Exibit 25-19)

S_R = 60.0 mph (Exhibit 25-19)

S_0 = 64.9 mph (Exhibit 25-19)

S = 62.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1504 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5014	0.92	Level	7	0	0.966	1.00	5641
Ramp	912	0.92	Level	0	0	1.000	1.00	991
UpStream								
DownStream	1504	0.92	Level	0	0	1.000	1.00	1635

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3018 pc/h
V_3 or V_{av34} 1311 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5641	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	4650	Exhibit 25-14	9600	No
V_R	991	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3018	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 28.1 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.517 (Exhibit 25-19)
S_R= 55.5 mph (Exhibit 25-19)
S_0= 75.6 mph (Exhibit 25-19)
S = 63.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 912 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4102	0.92	Level	7	0	0.966	1.00	4615
Ramp	1504	0.92	Level	0	0	1.000	1.00	1635
UpStream	912	0.92	Level	0	0	1.000	1.00	991
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.236 using Equation (Exhibit 25-5)

V_{12} = 1091 pc/h

V_3 or V_{av34} 1762 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1846 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6250	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3481	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 27.5 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.399 (Exibit 25-19)

S_R = 58.8 mph (Exhibit 25-19)

S_0 = 66.8 mph (Exhibit 25-19)

S = 62.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 132 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6686	0.92	Level	7	0	0.966	1.00	7522
Ramp	1383	0.92	Level	0	0	1.000	1.00	1503
UpStream								
DownStream	132	0.92	Level	0	0	1.000	1.00	143

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 4127 pc/h
V_3 or V_{av34} 1697 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7522	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6019	Exhibit 25-14	9600	No
V_R	1503	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4127	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 37.4 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.563 (Exhibit 25-19)
S_R= 54.2 mph (Exhibit 25-19)
S_0= 74.1 mph (Exhibit 25-19)
S = 61.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 362 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5304	0.92	Level	7	0	0.966	1.00	5967
Ramp	132	0.92	Level	0	0	1.000	1.00	143
UpStream								
DownStream	362	0.92	Level	0	0	1.000	1.00	393

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.423 using Equation (Exhibit 25-5)

V_{12} = 2524 pc/h

V_3 or V_{av34} 1721 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6110	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2667	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 21.8 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.328 (Exibit 25-19)

S_R= 60.8 mph (Exhibit 25-19)

S_0= 65.6 mph (Exhibit 25-19)

S = 63.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1000 ft
V_u = 132 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5437	0.92	Level	7	0	0.966	1.00	6117
Ramp	362	0.92	Level	0	0	1.000	1.00	393
UpStream	132	0.92	Level	0	0	1.000	1.00	143
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.401 using Equation (Exhibit 25-5)
V_{12} = 2454 pc/h
V_3 or V_{av34} 1831 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6510	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2847	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 22.9 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.337 (Exibit 25-19)
S_R= 60.6 mph (Exhibit 25-19)
S_0= 65.2 mph (Exhibit 25-19)
S = 63.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1702 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5238	0.92	Level	7	0	0.966	1.00	5893
Ramp	578	0.92	Level	0	0	1.000	1.00	628
UpStream								
DownStream	1702	0.92	Level	0	0	1.000	1.00	1850

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 2924 pc/h
V_3 or V_{av34} 1484 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5893	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5265	Exhibit 25-14	9600	No
V_R	628	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2924	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

D_R = 27.3 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.485 (Exhibit 25-19)
S_R= 56.4 mph (Exhibit 25-19)
S_0= 74.9 mph (Exhibit 25-19)
S = 64.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 578 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4660	0.92	Level	7	0	0.966	1.00	5242
Ramp	1702	0.92	Level	0	0	1.000	1.00	1850
UpStream	578	0.92	Level	0	0	1.000	1.00	628
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.210 using Equation (Exhibit 25-5)

V_{12} = 1098 pc/h

V_3 or V_{av34} 2072 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2096 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7092	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3946	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 31.0 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.474 (Exibit 25-19)

S_R = 56.7 mph (Exhibit 25-19)

S_0 = 66.1 mph (Exhibit 25-19)

S = 60.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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I-210 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7507	0.92	Level	7	0	0.966	1.00	8445
Ramp	665	0.92	Level	0	0	1.000	1.00	723
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 4090 pc/h

V_3 or V_{av34} 2177 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8445	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7722	Exhibit 25-14	9600	No
V_R	723	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4090	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 35.8 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.493 (Exhibit 25-19)

S_R = 56.2 mph (Exhibit 25-19)

S_0 = 72.2 mph (Exhibit 25-19)

S = 63.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6842	0.92	Level	7	0	0.966	1.00	7697
Ramp	593	0.92	Level	0	0	1.000	1.00	645
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.296 using Equation (Exhibit 25-5)

V_{12} = 2282 pc/h

V_3 or V_{av34} 2707 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2297 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8342	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2942	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.0 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.360 (Exibit 25-19)

S_R = 59.9 mph (Exhibit 25-19)

S_0 = 61.1 mph (Exhibit 25-19)

S = 60.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7435	0.92	Level	7	0	0.966	1.00	8364
Ramp	489	0.92	Level	0	0	1.000	1.00	532
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)

L_{EQ} =
P_{FM} = 0.374 using Equation (Exhibit 25-5)
V_{12} = 3131 pc/h
V_3 or V_{av34} 2616 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3345 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8896	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3877	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.1 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.460 (Exibit 25-19)
S_R = 57.1 mph (Exhibit 25-19)
S_0 = 62.2 mph (Exhibit 25-19)
S = 59.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)

L_{EQ} =
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8085	0.92	Level	7	0	0.966	1.00	9096
Ramp	1662	0.92	Level	0	0	1.000	1.00	1807
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 3702 pc/h

V_3 or V_{av34} 2697 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9096	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7289	Exhibit 25-14	9600	No
V_R	1807	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3702	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 24.4 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.591 (Exhibit 25-19)

S_R = 53.5 mph (Exhibit 25-19)

S_0 = 70.2 mph (Exhibit 25-19)

S = 62.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6423	0.92	Level	7	0	0.966	1.00	7226
Ramp	535	0.92	Level	0	0	1.000	1.00	582
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.432 using Equation (Exhibit 25-5)

V_{12} = 3120 pc/h

V_3 or V_{av34} 2053 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7808	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3702	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.4 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.416 (Exibit 25-19)

S_R = 58.4 mph (Exhibit 25-19)

S_0 = 64.4 mph (Exhibit 25-19)

S = 61.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7613	0.92	Level	7	0	0.966	1.00	8565
Ramp	679	0.92	Level	0	0	1.000	1.00	738
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 4151 pc/h

V_3 or V_{av34} 2207 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8565	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7827	Exhibit 25-14	9600	No
V_R	738	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4151	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 36.4 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.494 (Exhibit 25-19)

S_R = 56.2 mph (Exhibit 25-19)

S_0 = 72.1 mph (Exhibit 25-19)

S = 63.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7034	0.92	Level	7	0	0.966	1.00	7913
Ramp	500	0.92	Level	0	0	1.000	1.00	543
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.309 using Equation (Exhibit 25-5)
V_{12} = 2447 pc/h
V_3 or V_{av34} 2733 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2513 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8456	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3056	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.9 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.369 (Exibit 25-19)
S_R = 59.7 mph (Exhibit 25-19)
S_0 = 61.1 mph (Exhibit 25-19)
S = 60.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7534	0.92	Level	7	0	0.966	1.00	8476
Ramp	300	0.92	Level	0	0	1.000	1.00	326
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.400 using Equation (Exhibit 25-5)
V_{12} = 3391 pc/h
V_3 or V_{av34} 2542 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8802	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3717	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = 29.9 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.432 (Exibit 25-19)
S_R = 57.9 mph (Exhibit 25-19)
S_0 = 62.0 mph (Exhibit 25-19)
S = 60.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7754	0.92	Level	7	0	0.966	1.00	8723
Ramp	896	0.92	Level	0	0	1.000	1.00	974
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 2989 pc/h

V_3 or V_{av34} 2867 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3323 pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8723	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7749	Exhibit 25-14	9600	No
V_R	974	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2989	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 21.1 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.516 (Exhibit 25-19)

S_R = 55.6 mph (Exhibit 25-19)

S_0 = 70.2 mph (Exhibit 25-19)

S = 63.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6858	0.92	Level	7	0	0.966	1.00	7715
Ramp	979	0.92	Level	0	0	1.000	1.00	1064
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.372 using Equation (Exhibit 25-5)

V_{12} = 2866 pc/h

V_3 or V_{av34} 2424 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3086 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8779	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4150	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.7 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.505 (Exibit 25-19)

S_R= 55.8 mph (Exhibit 25-19)

S_0= 63.4 mph (Exhibit 25-19)

S = 59.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

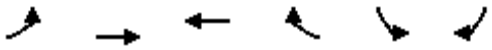
S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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Queuing Analysis Worksheets

I-210 Freeway Analysis



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	495	1386	0	453	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						440
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	569	1593	0	521	526
v/c Ratio		0.21	0.85		0.90	0.33
Control Delay		8.2	18.8		41.3	0.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.2	18.8		41.3	0.5
Queue Length 50th (ft)		38	244		173	0
Queue Length 95th (ft)		53	318		#317	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2691	1873		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.21	0.85		0.87	0.33

Intersection Summary	
Area Type:	Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	332	601	901	1423	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		460				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	353	639	959	1514	0	0
v/c Ratio	0.33	0.40	1.03	0.42		
Control Delay	17.3	0.7	52.8	0.3		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	17.3	0.7	52.8	0.3		
Queue Length 50th (ft)	51	0	~361	0		
Queue Length 95th (ft)	82	0	#598	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.33	0.40	1.03	0.42		

Intersection Summary

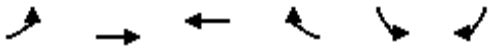
Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	50
Average Queue (ft)	433	374	13
95th Queue (ft)	499	374	46
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	49	85	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	919	397	0	333	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						277
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1044	451	0	378	277
v/c Ratio		0.36	0.22		0.75	0.17
Control Delay		8.2	7.6		29.2	0.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.2	7.6		29.2	0.2
Queue Length 50th (ft)		70	40		121	0
Queue Length 95th (ft)		101	65		188	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2906	2022		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.36	0.22		0.63	0.17

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	994	1003	697	965	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		508				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1046	1056	734	1016	0	0
v/c Ratio	0.97	0.65	0.79	0.28		
Control Delay	43.4	2.1	19.6	0.2		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	43.4	2.1	19.6	0.2		
Queue Length 50th (ft)	194	0	199	0		
Queue Length 95th (ft)	#315	0	#395	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.97	0.65	0.79	0.28		

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	52
Average Queue (ft)	459	365	10
95th Queue (ft)	459	396	45
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	88	78	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

APPENDIX Q

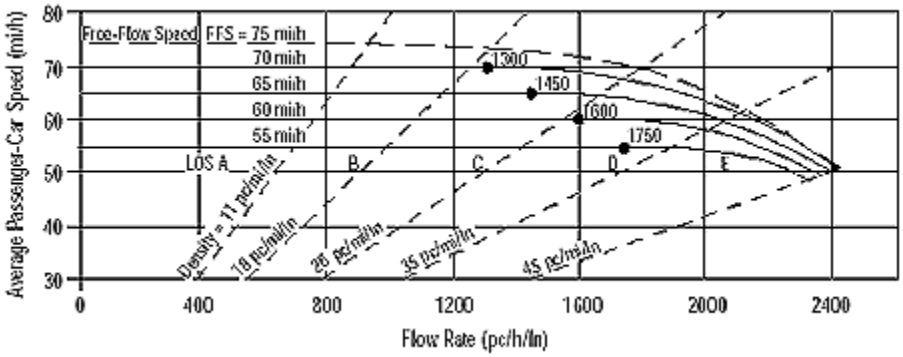
Interim Year (2016) With Project
HCS+ Freeway Segment, HCS+ Ramp Junction,
and Queuing Analysis Worksheets

HCS+ Freeway Segment Analysis Worksheets

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I-605 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*South of Live Oak Ave*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6871*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1932*	pc/h/ln	Design LOS		
S	*66.1*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*29.2*	pc/mi/ln	S		mi/h
LOS	*D*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

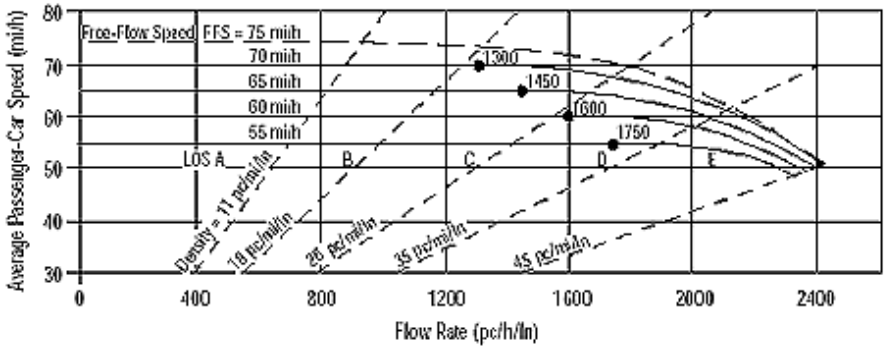
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5406*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

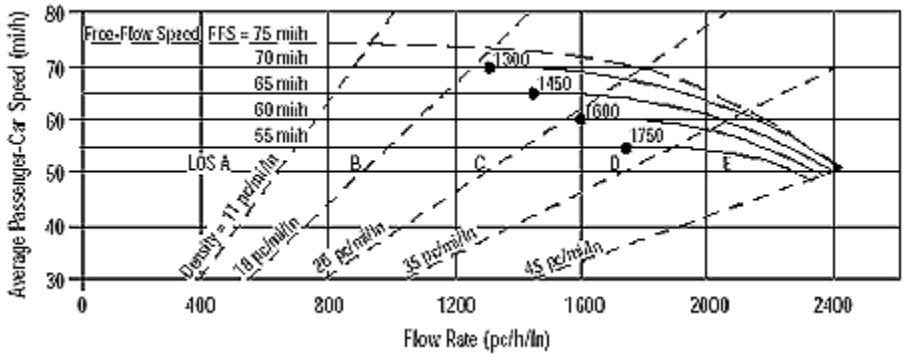
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1520*	pc/h/ln	Design LOS		
S	*69.7*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*21.8*	pc/mi/ln	S		mi/h
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW EB Arrw Lp On and WB On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5669*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1594*	pc/h/ln
S	*69.5*	mi/h
D = v_p / S	*22.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

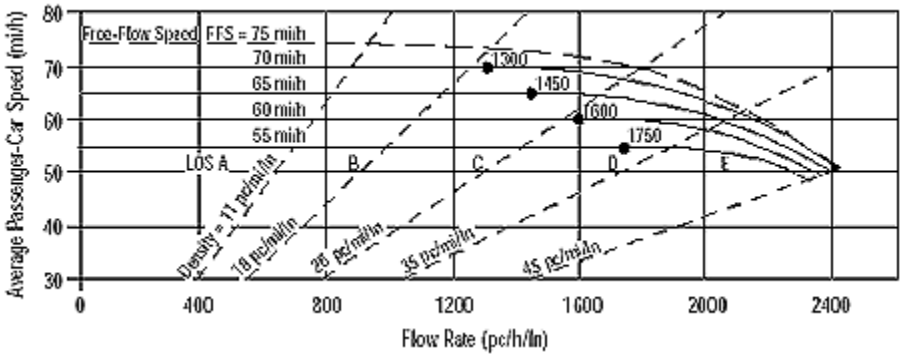
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6318*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1777*	pc/h/ln
S	*68.1*	mi/h
D = v_p / S	*26.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

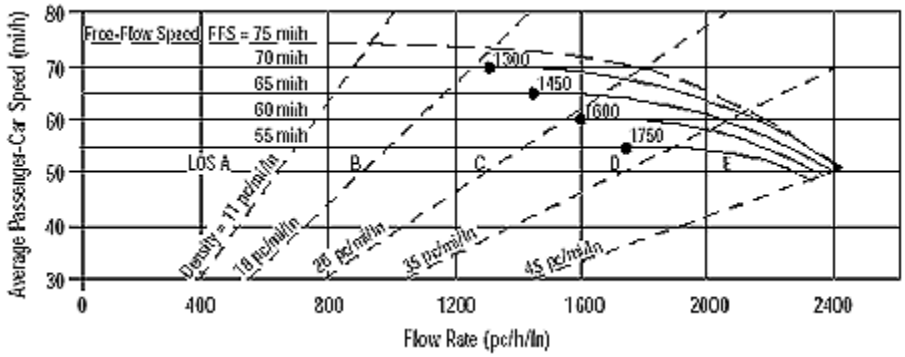
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5171*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1454*	pc/h/ln
S	*69.9*	mi/h
D = v_p / S	*20.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

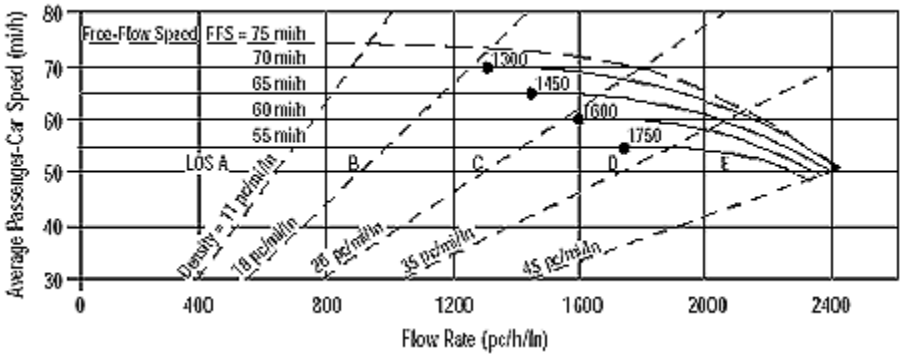
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Arrow Hwy and Live Oak*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4102*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1154*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*16.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

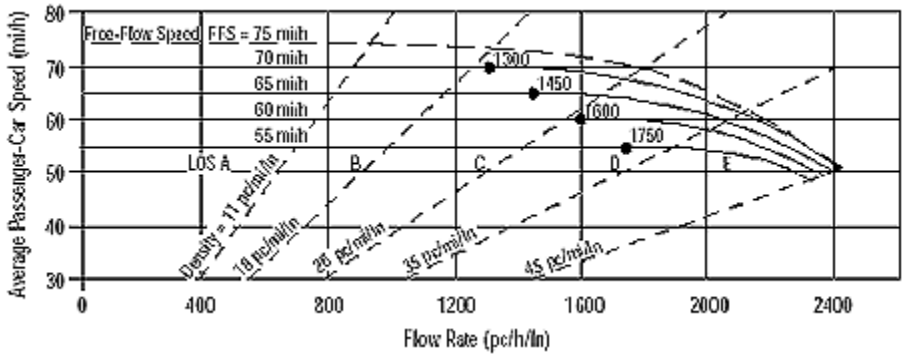
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5720*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1609*	pc/h/ln
S	*69.4*	mi/h
D = v_p / S	*23.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

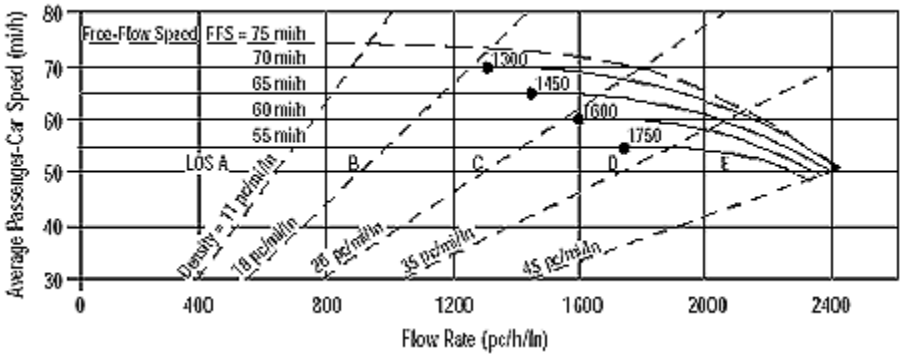
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6815*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1917*	pc/h/ln
S	*66.3*	mi/h
D = v_p / S	*28.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

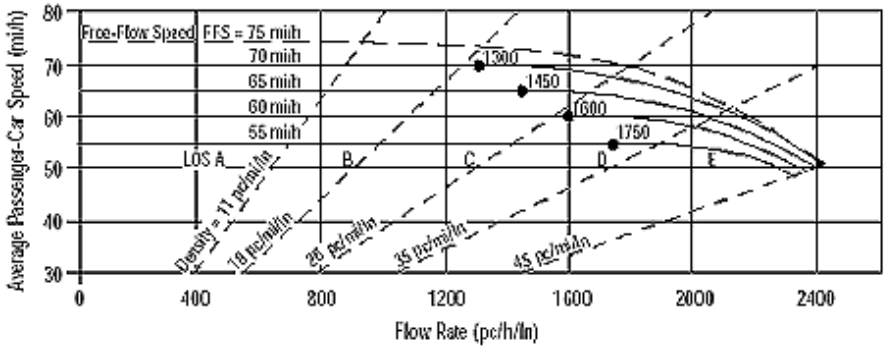
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5304*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

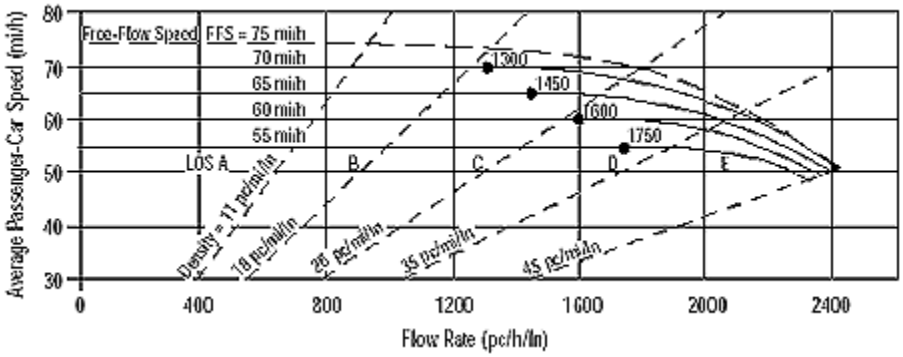
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1492*	pc/h/ln	Design LOS		
S	*69.8*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*21.4*	pc/mi/ln	S		mi/h
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5437*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1529*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*21.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

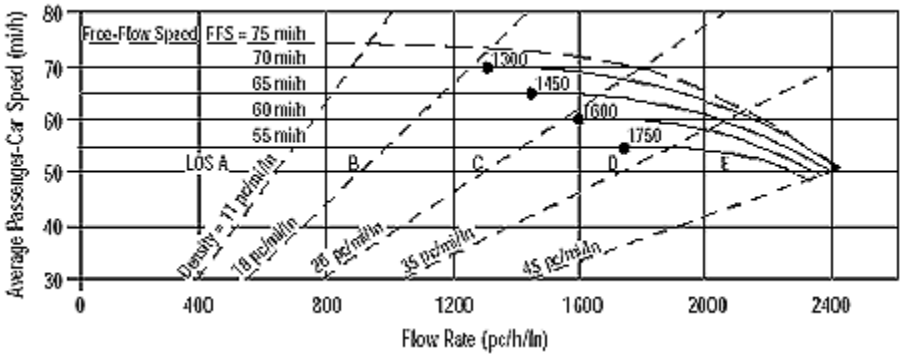
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5940*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1671*	pc/h/ln
S	*69.0*	mi/h
D = v_p / S	*24.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

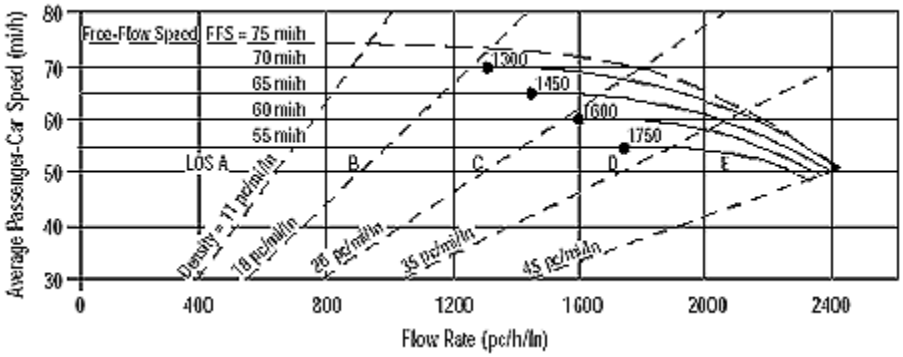
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5380*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

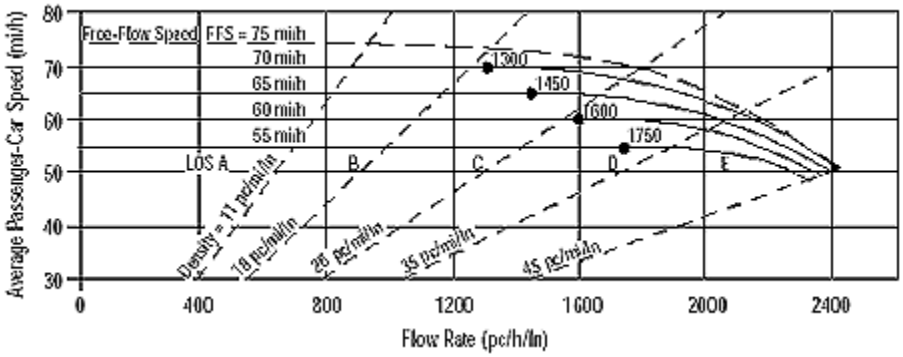
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1513*	pc/h/ln	Design LOS		
S	*69.8*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*21.7*	pc/mi/ln	S		mi/h
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4660*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1311*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*18.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

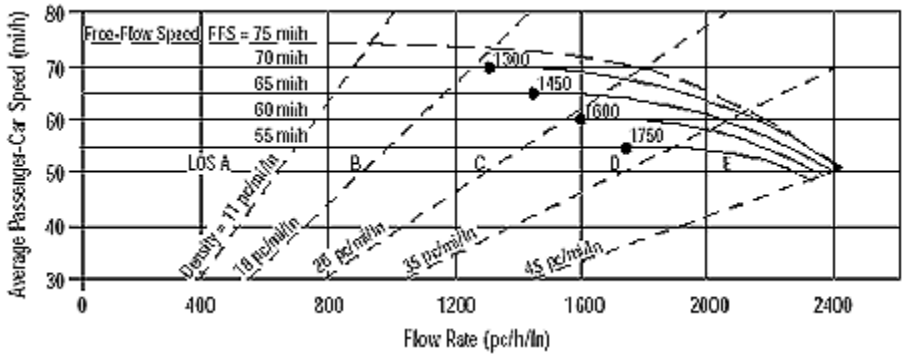
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2016 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6482*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1823*	pc/h/ln
S	*67.6*	mi/h
D = v_p / S	*27.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

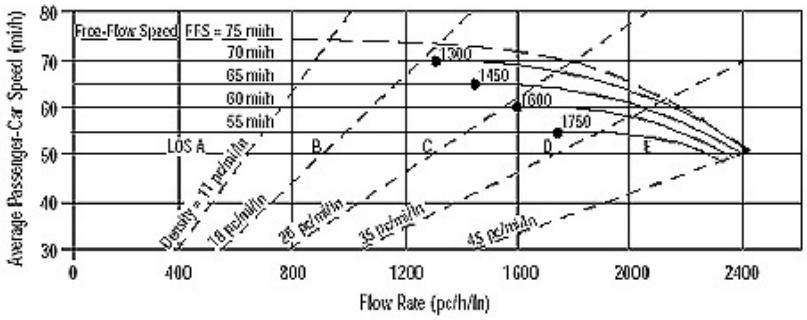
Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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I-210 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7845*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

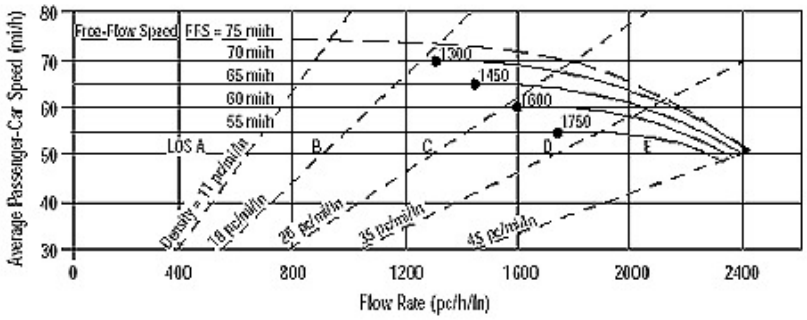
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2206*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*59.9*	mi/h	S		mi/h
D = v_p / S	*36.8*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*E*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*6915*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

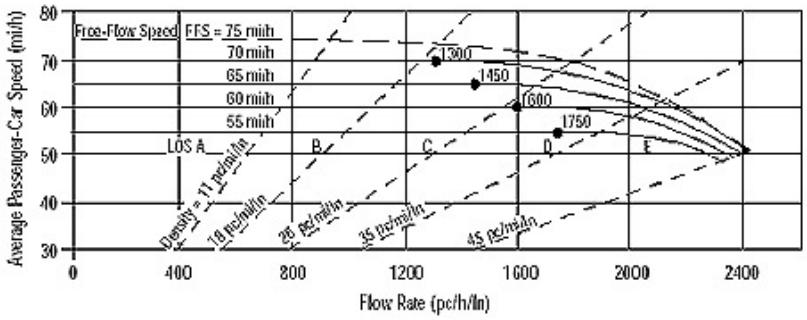
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1945*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*65.8*	mi/h	S		mi/h
D = v_p / S	*29.5*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7997*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

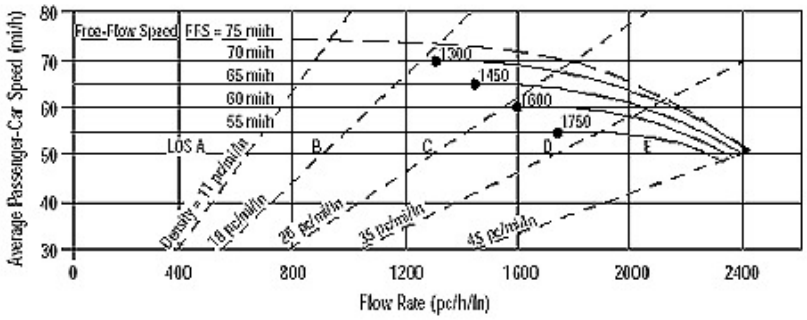
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2249*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*58.6*	mi/h	S	mi/h
D = v_p / S	*38.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*8158*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

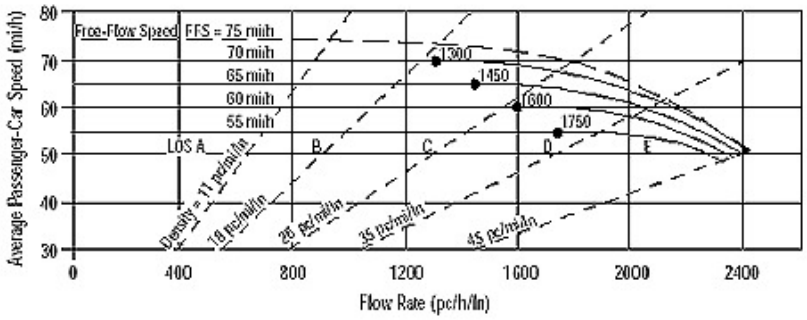
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2294*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*57.2*	mi/h	S		mi/h
D = v_p / S	*40.1*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*E*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6496*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

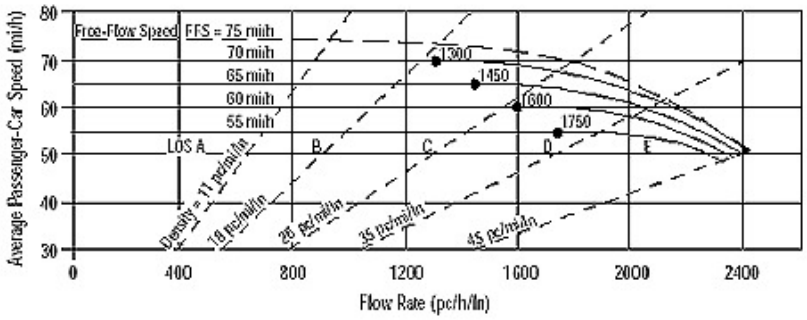
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1827*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*67.5*	mi/h	S	mi/h
D = v_p / S	*27.1*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7035*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

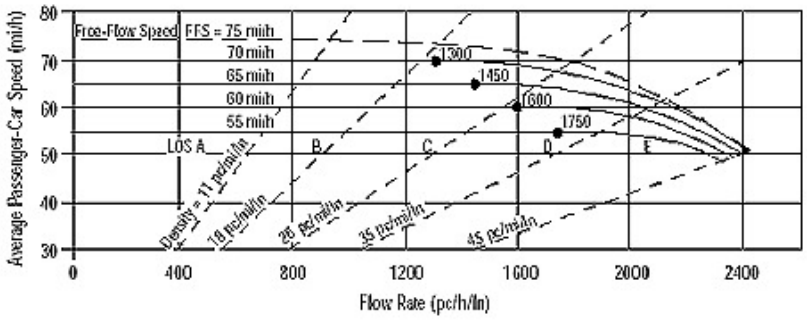
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1979*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*65.2*	mi/h	S	mi/h
D = v_p / S	*30.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7680*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

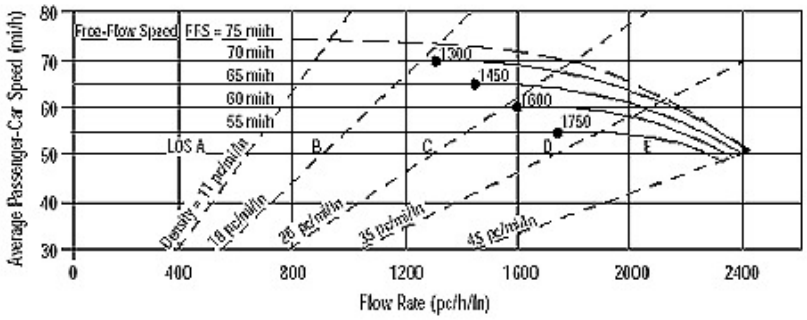
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2160*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*61.2*	mi/h	S	mi/h
D = v_p / S	*35.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7096*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

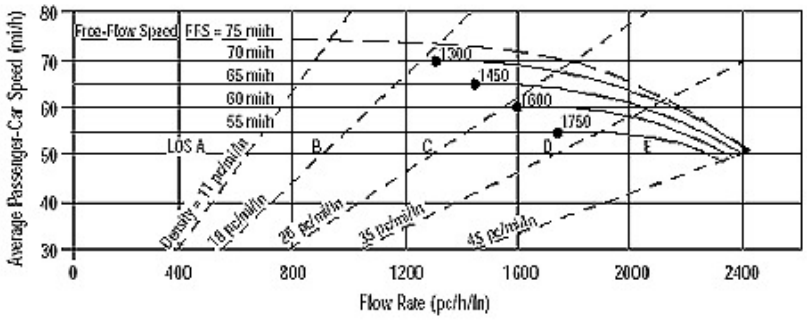
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1996*	pc/h/ln	Design LOS		
S	*64.9*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*30.7*	pc/mi/ln	S		mi/h
LOS	*D*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7896*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

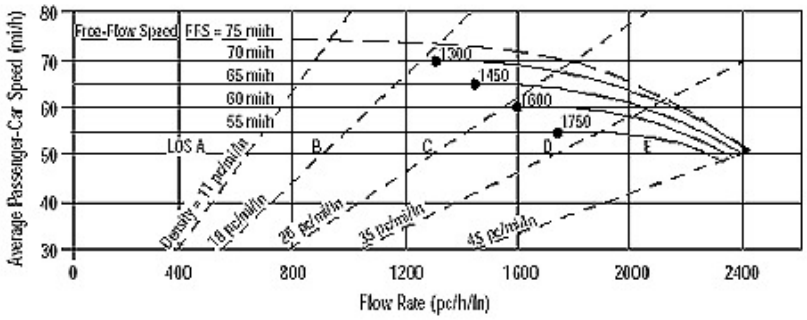
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2221*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*59.5*	mi/h	S	mi/h
D = v_p / S	*37.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7817*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

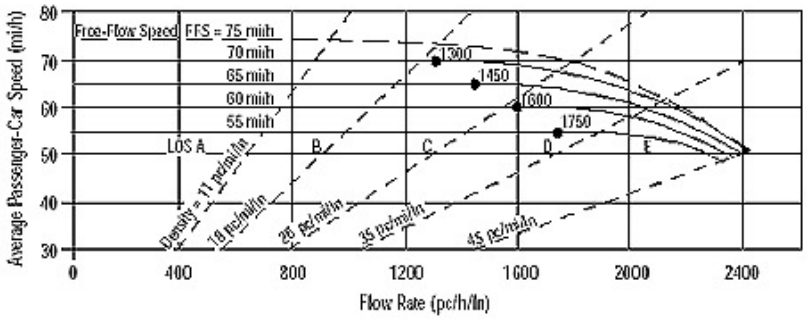
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2199*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*60.1*	mi/h	S	mi/h
D = v_p / S	*36.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*6921*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

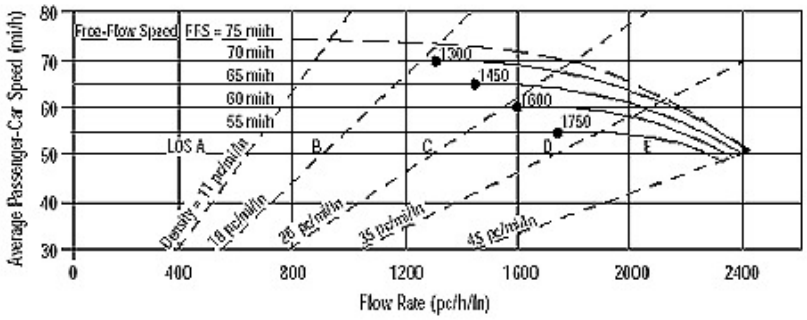
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1947*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*65.8*	mi/h	S	mi/h
D = v_p / S	*29.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2016WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7905*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2223*	pc/h/ln
S	*59.4*	mi/h
D = v_p / S	*37.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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HCS+ Ramp Junction Analysis Worksheets

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I-605 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 263 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6871	0.92	Level	7	0	0.966	1.00	7730
Ramp	1465	0.92	Level	0	0	1.000	1.00	1592
UpStream								
DownStream	263	0.92	Level	0	0	1.000	1.00	286

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 4268 pc/h
V_3 or V_{av34} 1731 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7730	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6138	Exhibit 25-14	9600	No
V_R	1592	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4268	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 38.6 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.571 (Exhibit 25-19)
S_R= 54.0 mph (Exhibit 25-19)
S_0= 73.9 mph (Exhibit 25-19)
S = 61.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 649 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5406	0.92	Level	7	0	0.966	1.00	6082
Ramp	263	0.92	Level	0	0	1.000	1.00	286
UpStream								
DownStream	649	0.92	Level	0	0	1.000	1.00	705

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.405 using Equation (Exhibit 25-5)
V_{12} = 2464 pc/h
V_3 or V_{av34} 1809 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6368	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2750	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.4 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.333 (Exibit 25-19)
S_R= 60.7 mph (Exhibit 25-19)
S_0= 65.3 mph (Exhibit 25-19)
S = 63.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1000 ft

V_u = 263 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5669	0.92	Level	7	0	0.966	1.00	6378
Ramp	649	0.92	Level	0	0	1.000	1.00	705
UpStream	263	0.92	Level	0	0	1.000	1.00	286
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.362 using Equation (Exhibit 25-5)

V_{12} = 2310 pc/h

V_3 or V_{av34} 2034 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2551 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7083	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3256	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 26.0 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.371 (Exibit 25-19)

S_R = 59.6 mph (Exhibit 25-19)

S_0 = 64.9 mph (Exhibit 25-19)

S = 62.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1618 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5171	0.92	Level	7	0	0.966	1.00	5817
Ramp	1069	0.92	Level	0	0	1.000	1.00	1162
UpStream								
DownStream	1618	0.92	Level	0	0	1.000	1.00	1759

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3192 pc/h
V_3 or V_{av34} 1312 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5817	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	4655	Exhibit 25-14	9600	No
V_R	1162	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3192	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 29.6 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.533 (Exhibit 25-19)
S_R= 55.1 mph (Exhibit 25-19)
S_0= 75.6 mph (Exhibit 25-19)
S = 62.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 4300 ft
V_u = 1069 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4102	0.92	Level	7	0	0.966	1.00	4615
Ramp	1618	0.92	Level	0	0	1.000	1.00	1759
UpStream	1069	0.92	Level	0	0	1.000	1.00	1162
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.221 using Equation (Exhibit 25-5)
V_{12} = 1020 pc/h
V_3 or V_{av34} 1797 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes,V_{12a} = 1846 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6374	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3605	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 28.4 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.415 (Exibit 25-19)
S_R= 58.4 mph (Exhibit 25-19)
S_0= 66.8 mph (Exhibit 25-19)
S = 61.8 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 132 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6815	0.92	Level	7	0	0.966	1.00	7667
Ramp	1512	0.92	Level	0	0	1.000	1.00	1643
UpStream								
DownStream	132	0.92	Level	0	0	1.000	1.00	143

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 4269 pc/h
V_3 or V_{av34} 1699 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7667	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6024	Exhibit 25-14	9600	No
V_R	1643	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4269	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 38.6 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.576 (Exhibit 25-19)
S_R= 53.9 mph (Exhibit 25-19)
S_0= 74.1 mph (Exhibit 25-19)
S = 61.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 503 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5304	0.92	Level	7	0	0.966	1.00	5967
Ramp	132	0.92	Level	0	0	1.000	1.00	143
UpStream								
DownStream	503	0.92	Level	0	0	1.000	1.00	547

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.423 using Equation (Exhibit 25-5)
V_{12} = 2524 pc/h
V_3 or V_{av34} 1721 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6110	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2667	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 21.8 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.328 (Exibit 25-19)
S_R= 60.8 mph (Exhibit 25-19)
S_0= 65.6 mph (Exhibit 25-19)
S = 63.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1000 ft

V_u = 132 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5437	0.92	Level	7	0	0.966	1.00	6117
Ramp	503	0.92	Level	0	0	1.000	1.00	547
UpStream	132	0.92	Level	0	0	1.000	1.00	143
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.382 using Equation (Exhibit 25-5)

V_{12} = 2337 pc/h

V_3 or V_{av34} 1890 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2446 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6664	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2993	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 24.0 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.348 (Exibit 25-19)

S_R = 60.3 mph (Exhibit 25-19)

S_0 = 65.2 mph (Exhibit 25-19)

S = 62.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1822 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5380	0.92	Level	7	0	0.966	1.00	6052
Ramp	720	0.92	Level	0	0	1.000	1.00	783
UpStream								
DownStream	1822	0.92	Level	0	0	1.000	1.00	1980

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3080 pc/h
V_3 or V_{av34} 1486 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6052	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5269	Exhibit 25-14	9600	No
V_R	783	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3080	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 28.7 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.498 (Exhibit 25-19)
S_R= 56.0 mph (Exhibit 25-19)
S_0= 74.9 mph (Exhibit 25-19)
S = 63.9 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 720 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4660	0.92	Level	7	0	0.966	1.00	5242
Ramp	1822	0.92	Level	0	0	1.000	1.00	1980
UpStream	720	0.92	Level	0	0	1.000	1.00	783
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.193 using Equation (Exhibit 25-5)

V_{12} = 1013 pc/h

V_3 or V_{av34} 2114 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2096 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7222	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4076	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 32.0 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.502 (Exibit 25-19)

S_R = 56.0 mph (Exhibit 25-19)

S_0 = 66.1 mph (Exhibit 25-19)

S = 60.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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I-210 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7585	0.92	Level	7	0	0.966	1.00	8533
Ramp	670	0.92	Level	0	0	1.000	1.00	728
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 4131 pc/h

V_3 or V_{av34} 2201 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8533	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7805	Exhibit 25-14	9600	No
V_R	728	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4131	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 36.2 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.494 (Exhibit 25-19)

S_R = 56.2 mph (Exhibit 25-19)

S_0 = 72.1 mph (Exhibit 25-19)

S = 63.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6915	0.92	Level	7	0	0.966	1.00	7779
Ramp	593	0.92	Level	0	0	1.000	1.00	645
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.296 using Equation (Exhibit 25-5)

V_{12} = 2306 pc/h

V_3 or V_{av34} 2736 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2379 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8424	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3024	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.6 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.366 (Exibit 25-19)

S_R = 59.7 mph (Exhibit 25-19)

S_0 = 61.1 mph (Exhibit 25-19)

S = 60.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7508	0.92	Level	7	0	0.966	1.00	8446
Ramp	489	0.92	Level	0	0	1.000	1.00	532
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)

L_{EQ} =
P_{FM} = 0.374 using Equation (Exhibit 25-5)
V_{12} = 3161 pc/h
V_3 or V_{av34} 2642 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3378 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8978	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3910	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 31.3 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.467 (Exibit 25-19)
S_R = 56.9 mph (Exhibit 25-19)
S_0 = 62.1 mph (Exhibit 25-19)
S = 59.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)

L_{EQ} =
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8158	0.92	Level	7	0	0.966	1.00	9178
Ramp	1662	0.92	Level	0	0	1.000	1.00	1807
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 3723 pc/h

V_3 or V_{av34} 2727 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = 3778 pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9178	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7371	Exhibit 25-14	9600	No
V_R	1807	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3723	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 25.0 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.591 (Exhibit 25-19)

S_R = 53.5 mph (Exhibit 25-19)

S_0 = 70.2 mph (Exhibit 25-19)

S = 62.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6496	0.92	Level	7	0	0.966	1.00	7308
Ramp	539	0.92	Level	0	0	1.000	1.00	586
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.431 using Equation (Exhibit 25-5)

V_{12} = 3152 pc/h

V_3 or V_{av34} 2078 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7894	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3738	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.7 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.422 (Exibit 25-19)

S_R = 58.2 mph (Exhibit 25-19)

S_0 = 64.3 mph (Exhibit 25-19)

S = 61.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7680	0.92	Level	7	0	0.966	1.00	8640
Ramp	584	0.92	Level	0	0	1.000	1.00	635
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 4125 pc/h

V_3 or V_{av34} 2257 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8640	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	8005	Exhibit 25-14	9600	No
V_R	635	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4125	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 36.1 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.485 (Exhibit 25-19)

S_R = 56.4 mph (Exhibit 25-19)

S_0 = 71.9 mph (Exhibit 25-19)

S = 63.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7096	0.92	Level	7	0	0.966	1.00	7983
Ramp	500	0.92	Level	0	0	1.000	1.00	543
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)

L_{EQ} =
P_{FM} = 0.309 using Equation (Exhibit 25-5)
V_{12} = 2468 pc/h
V_3 or V_{av34} 2757 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2583 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8526	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3126	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.5 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.375 (Exibit 25-19)
S_R = 59.5 mph (Exhibit 25-19)
S_0 = 61.1 mph (Exhibit 25-19)
S = 60.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)

L_{EQ} =
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7596	0.92	Level	7	0	0.966	1.00	8545
Ramp	300	0.92	Level	0	0	1.000	1.00	326
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.400 using Equation (Exhibit 25-5)
V_{12} = 3418 pc/h
V_3 or V_{av34} 2563 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8871	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3744	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = 30.1 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.437 (Exibit 25-19)
S_R = 57.8 mph (Exhibit 25-19)
S_0 = 61.9 mph (Exhibit 25-19)
S = 60.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7817	0.92	Level	7	0	0.966	1.00	8794
Ramp	896	0.92	Level	0	0	1.000	1.00	974
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 3007 pc/h

V_3 or V_{av34} 2893 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3394 pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8794	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7820	Exhibit 25-14	9600	No
V_R	974	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3007	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 21.7 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.516 (Exhibit 25-19)

S_R = 55.6 mph (Exhibit 25-19)

S_0 = 70.2 mph (Exhibit 25-19)

S = 63.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6921	0.92	Level	7	0	0.966	1.00	7786
Ramp	984	0.92	Level	0	0	1.000	1.00	1070
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.371 using Equation (Exhibit 25-5)
V_{12} = 2887 pc/h
V_3 or V_{av34} 2449 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes,V_{12a} = 3114 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8856	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4184	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.0 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.514 (Exibit 25-19)
S_R= 55.6 mph (Exhibit 25-19)
S_0= 63.3 mph (Exhibit 25-19)
S = 59.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

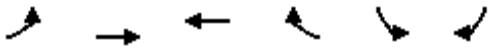
Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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Queuing Analysis Worksheets

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	504	1396	0	610	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						440
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	579	1605	0	701	526
v/c Ratio		0.22	0.87		1.17	0.33
Control Delay		8.4	20.3		117.8	0.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.4	20.3		117.8	0.5
Queue Length 50th (ft)		38	248		~313	0
Queue Length 95th (ft)		54	#324		#470	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2636	1835		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.22	0.87		1.17	0.33

Intersection Summary	
Area Type:	Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	337	601	1015	1425	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		443				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	359	639	1080	1516	0	0
v/c Ratio	0.33	0.40	1.16	0.42		
Control Delay	17.4	0.7	100.8	0.3		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	17.4	0.7	100.8	0.3		
Queue Length 50th (ft)	52	0	~484	0		
Queue Length 95th (ft)	83	0	#698	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.33	0.40	1.16	0.42		

Intersection Summary

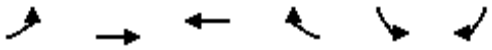
Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	26
Average Queue (ft)	449	374	9
95th Queue (ft)	480	374	26
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	37	94	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	933	409	0	475	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						277
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1060	465	0	540	277
v/c Ratio		0.40	0.25		0.92	0.17
Control Delay		9.5	8.7		44.6	0.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		9.5	8.7		44.6	0.2
Queue Length 50th (ft)		79	45		183	0
Queue Length 95th (ft)		103	68		#340	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2672	1860		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.40	0.25		0.90	0.17

Intersection Summary	
Area Type:	Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	997	1003	817	968	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		477				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1049	1056	860	1019	0	0
v/c Ratio	0.97	0.65	0.93	0.28		
Control Delay	44.0	2.1	31.8	0.2		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	44.0	2.1	31.8	0.2		
Queue Length 50th (ft)	194	0	264	0		
Queue Length 95th (ft)	#317	0	#509	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.97	0.65	0.93	0.28		

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	17
Average Queue (ft)	459	374	3
95th Queue (ft)	459	374	15
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	100	89	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

APPENDIX R

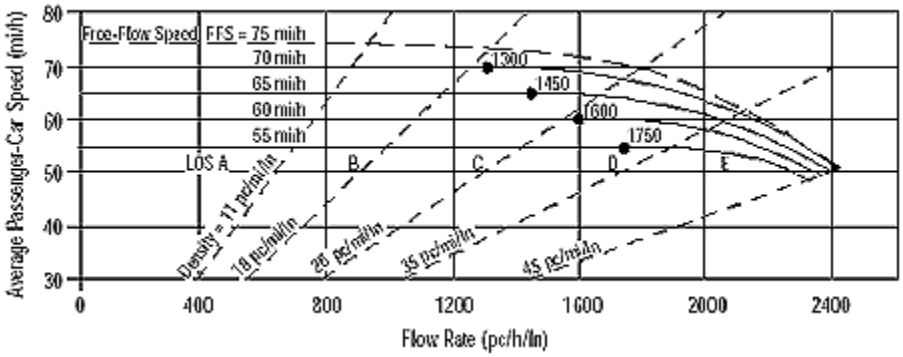
Long Range (2035) Without Project
HCS+ Freeway Segment, HCS+ Ramp Junction,
and Queuing Analysis Worksheets

HCS+ Freeway Segment Analysis Worksheets

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I-605 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7024*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1975*	pc/h/ln
S	*65.3*	mi/h
D = v_p / S	*30.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

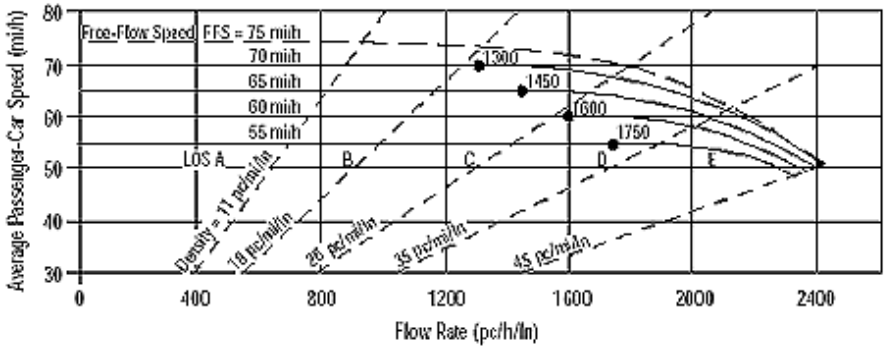
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5626*	veh/h	Peak-Hour Factor, PHF	*0.92*	
AADT		veh/day	%Trucks and Buses, P_T	*7*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1582*	pc/h/ln
S	*69.5*	mi/h
D = v_p / S	*22.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

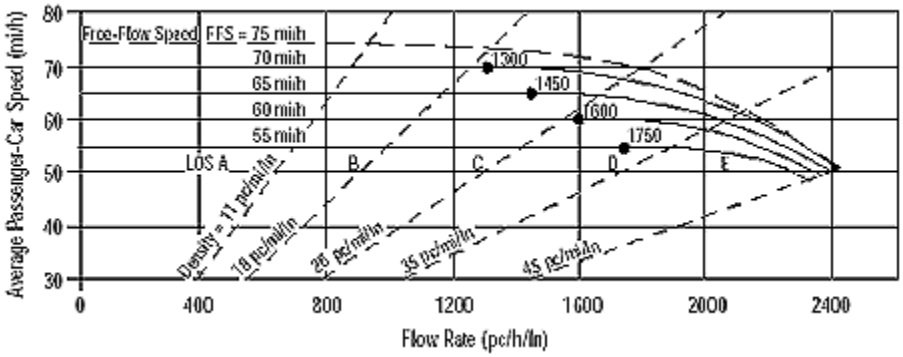
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW EB Arrw Lp On and WB On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5900*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1659*	pc/h/ln
S	*69.1*	mi/h
D = v_p / S	*24.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

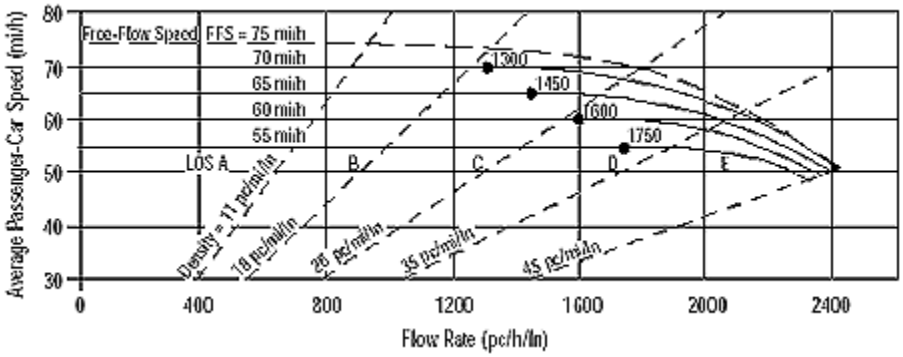
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6418*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1805*	pc/h/ln
S	*67.8*	mi/h
D = v_p / S	*26.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

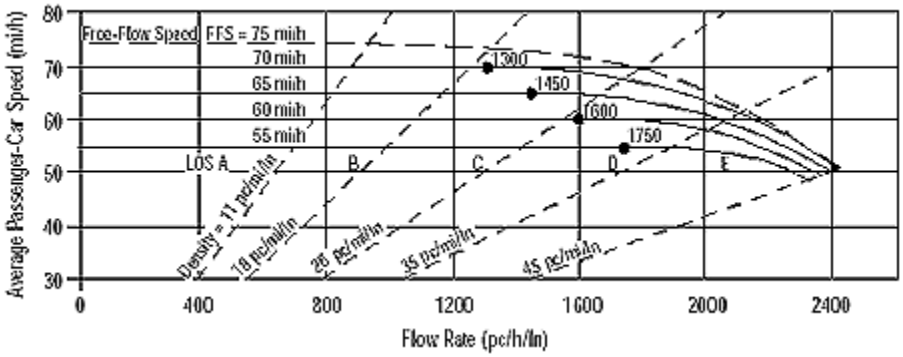
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5214*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1466*	pc/h/ln
S	*69.9*	mi/h
D = v_p / S	*21.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

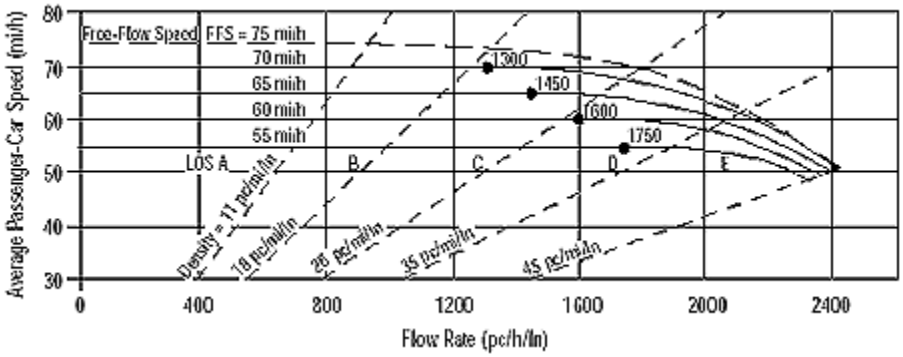
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Arrow Hwy and Live Oak*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4266*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1200*	pc/h/ln	Design LOS		
S	*70.0*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*17.1*	pc/mi/ln	S		mi/h
LOS	*B*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

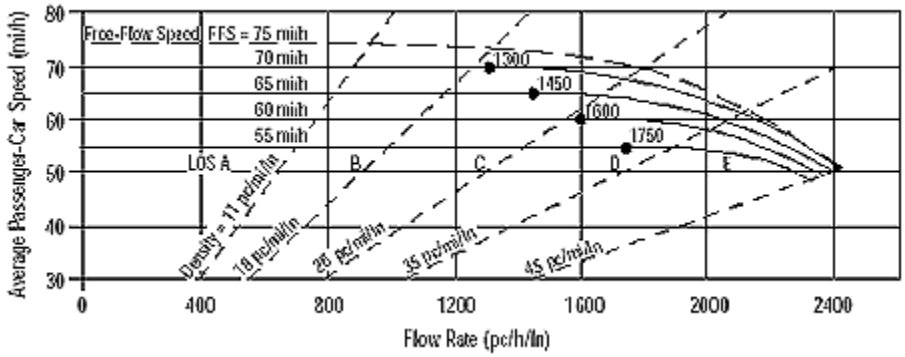
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5831*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1640*	pc/h/ln
S	*69.2*	mi/h
D = v_p / S	*23.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

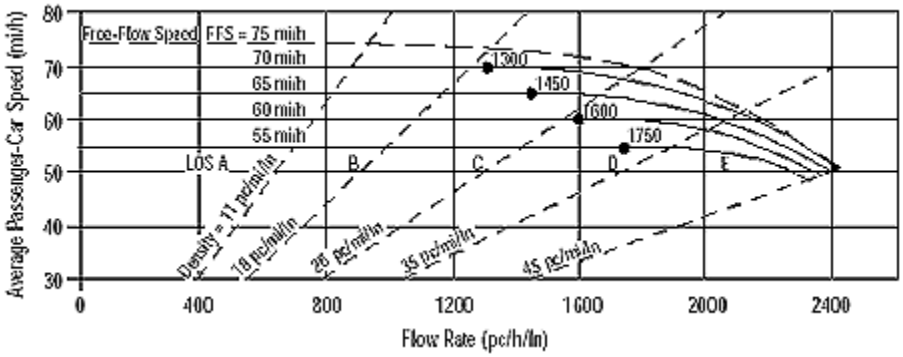
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6955*	veh/h	Peak-Hour Factor, PHF	*0.92*	
AADT		veh/day	%Trucks and Buses, P_T	*7*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1956*	pc/h/ln
S	*65.7*	mi/h
D = v_p / S	*29.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

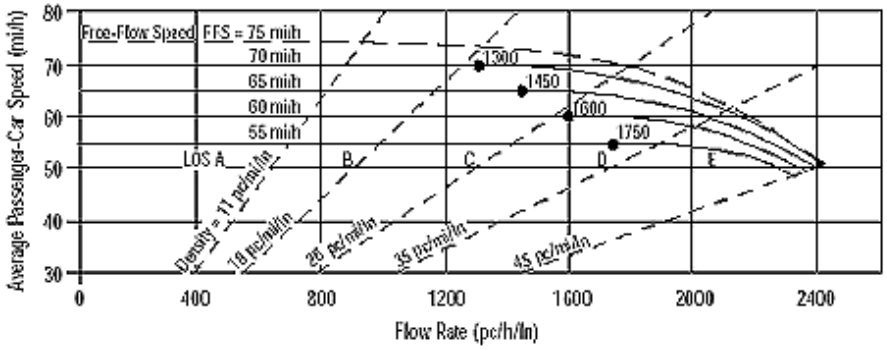
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2035*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5517*	veh/h	Peak-Hour Factor, PHF	*0.92*	
AADT		veh/day	%Trucks and Buses, P_T	*7*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1552*	pc/h/ln
S	*69.6*	mi/h
D = v_p / S	*22.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

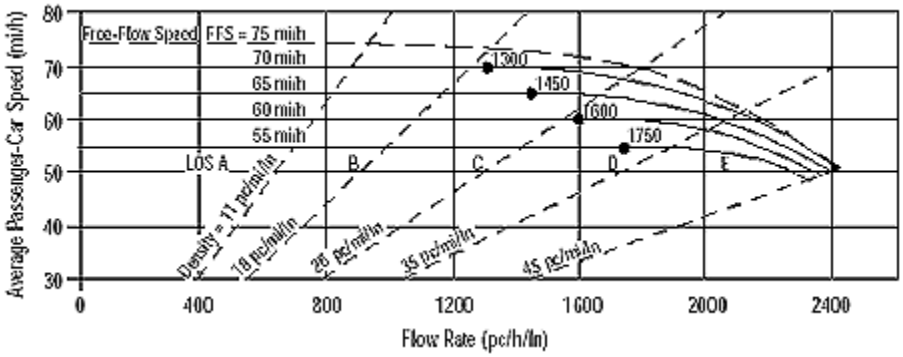
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW EB Arrw Lp On and WB On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5655*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1590*	pc/h/ln
S	*69.5*	mi/h
D = v_p / S	*22.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

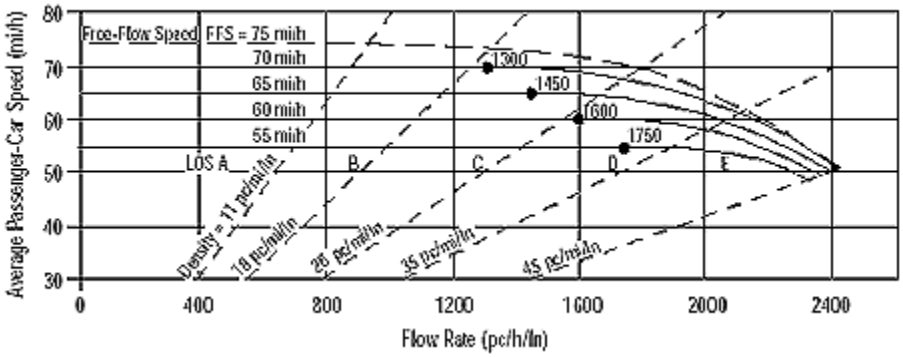
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6030*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1696*	pc/h/ln
S	*68.8*	mi/h
D = v_p / S	*24.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

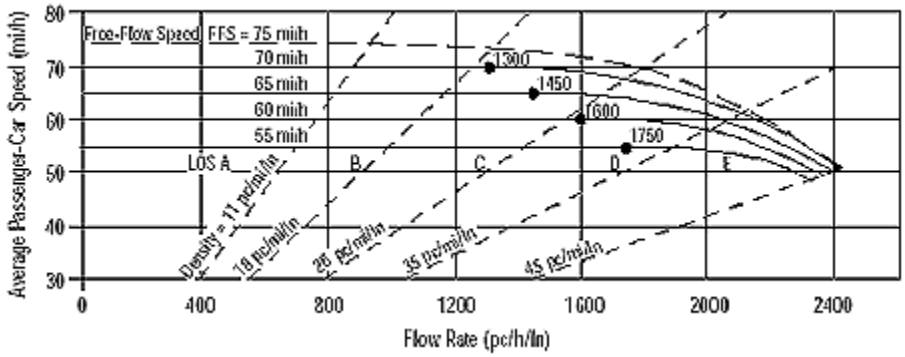
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5447*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1532*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*22.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

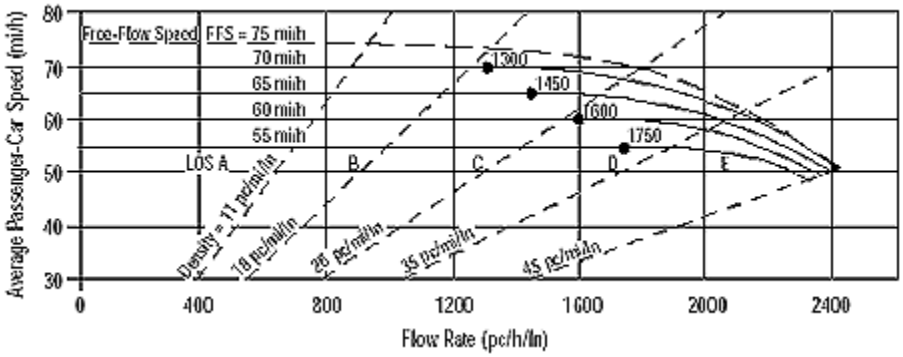
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4847*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1363*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*19.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

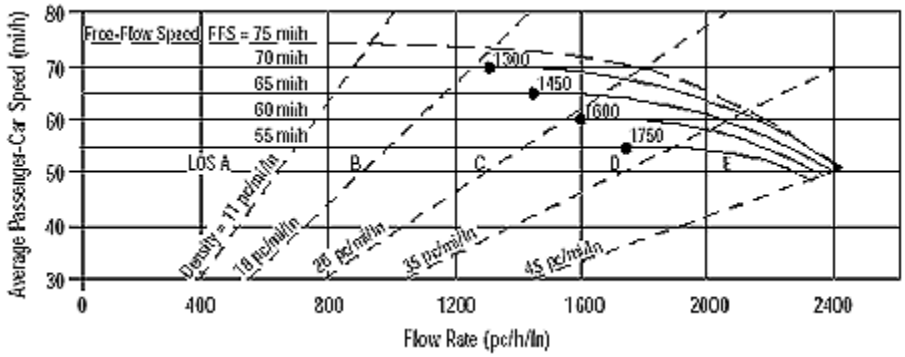
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6619*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1862*	pc/h/ln
S	*67.1*	mi/h
D = v_p / S	*27.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

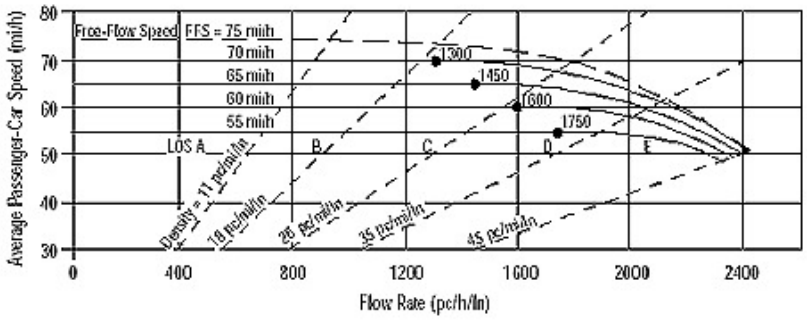
Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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I-210 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7819*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

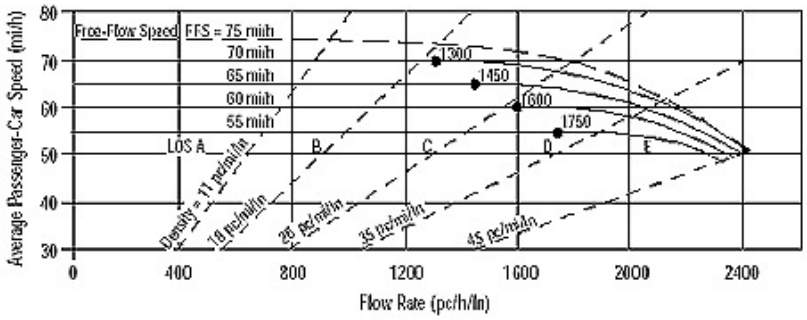
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2199*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*60.1*	mi/h	S	mi/h
D = v_p / S	*36.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7128*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

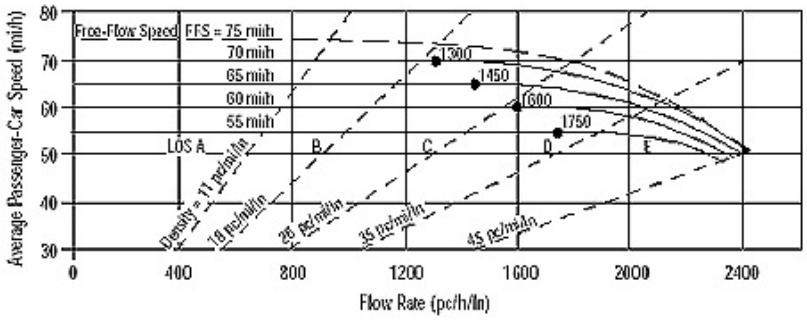
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2005*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*64.8*	mi/h	S		mi/h
D = v_p / S	*31.0*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8255*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

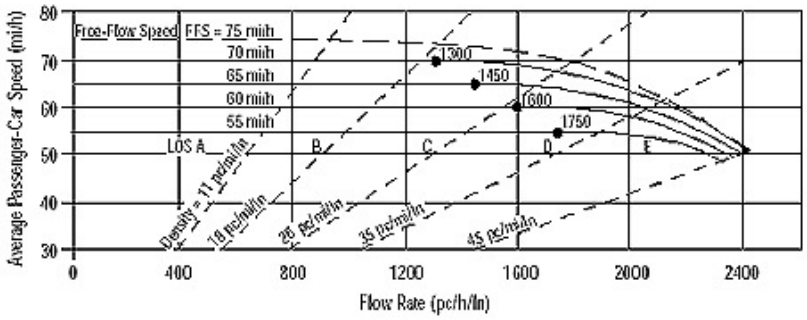
LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2322*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*56.2*	mi/h	S	mi/h
D = v_p / S	*41.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*8421*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

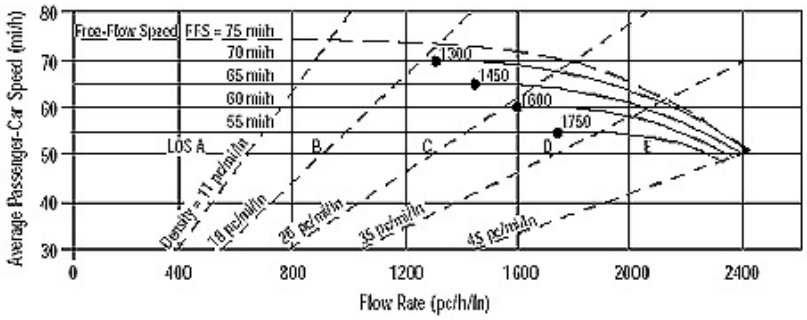
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2368*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*54.6*	mi/h	S	mi/h
D = v_p / S	*43.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*6690*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

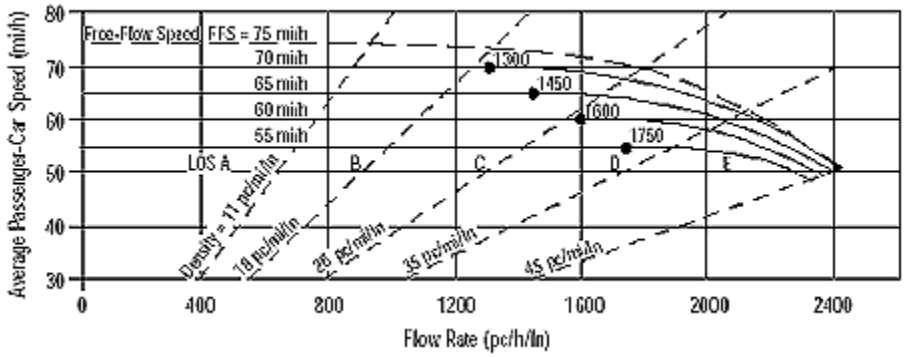
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1882*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*66.8*	mi/h	S	mi/h
D = v_p / S	*28.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7246*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2038*	pc/h/ln
S	*64.1*	mi/h
D = v_p / S	*31.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

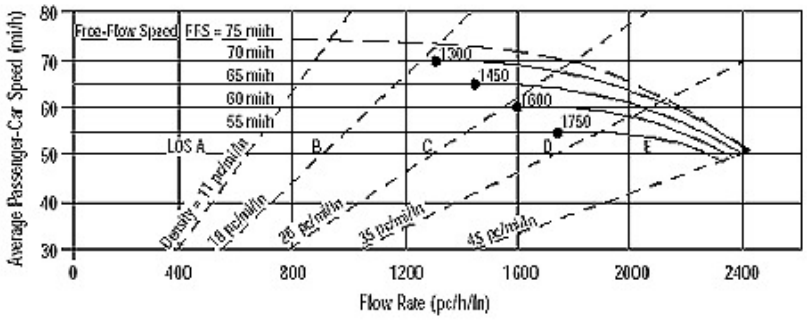
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7929*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

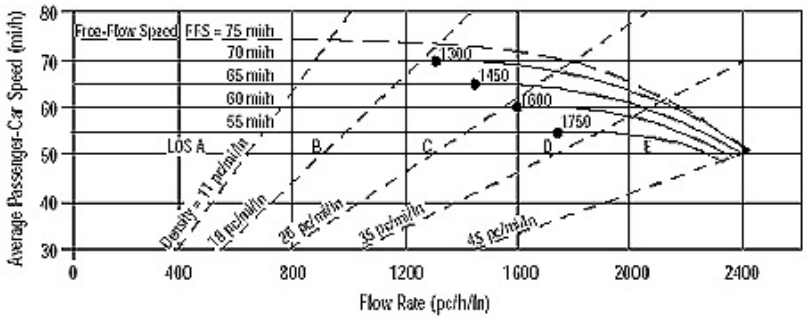
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2230*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*59.2*	mi/h	S	mi/h
D = v_p / S	*37.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7327*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

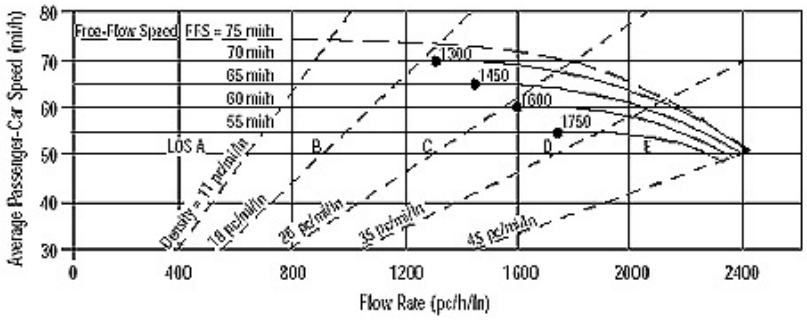
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2061*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*63.6*	mi/h	S		mi/h
D = v_p / S	*32.4*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8160*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

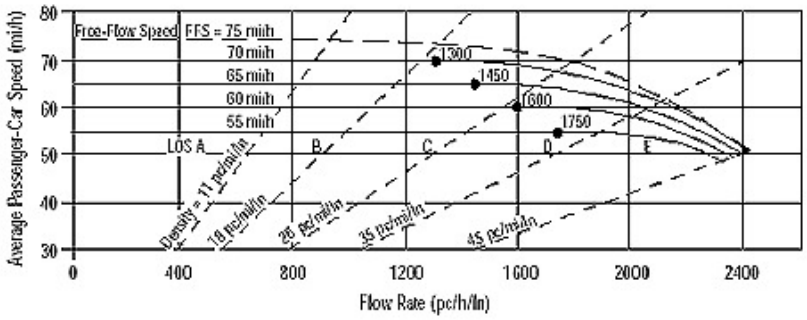
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2295*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*57.2*	mi/h	S	mi/h
D = v_p / S	*40.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*8075*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

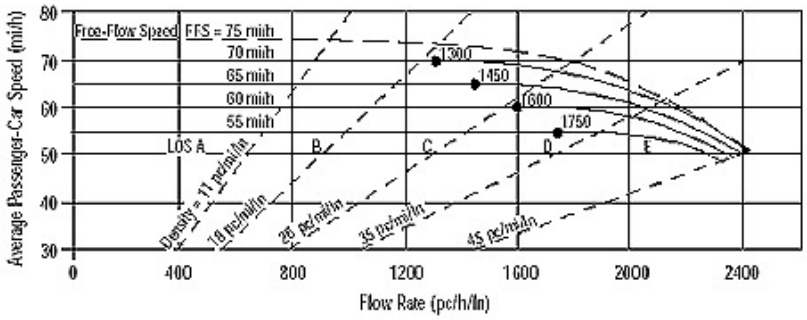
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2271*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*57.9*	mi/h	S	mi/h
D = v_p / S	*39.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7142*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

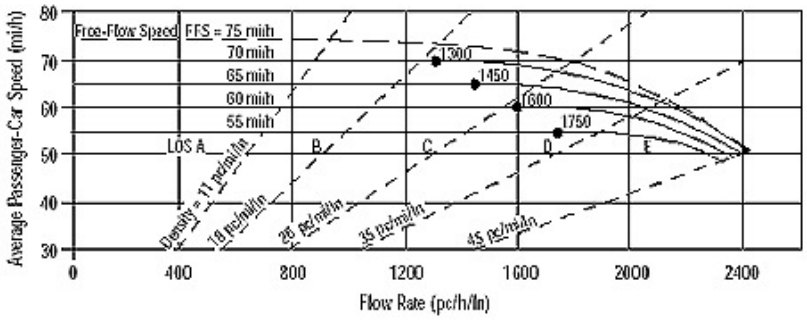
Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2009*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.7*	mi/h	S	mi/h
D = v_p / S	*31.1*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035NP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8161*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2295*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*57.2*	mi/h	S	mi/h
D = v_p / S	*40.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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I-210 Freeway Analysis

HCS+ Ramp Junction Analysis Worksheets

I-605 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 274 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7024	0.92	Level	7	0	0.966	1.00	7902
Ramp	1398	0.92	Level	0	0	1.000	1.00	1520
UpStream								
DownStream	274	0.92	Level	0	0	1.000	1.00	298

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 4303 pc/h
V_3 or V_{av34} 1799 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7902	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6382	Exhibit 25-14	9600	No
V_R	1520	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4303	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 38.9 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.565 (Exhibit 25-19)
S_R = 54.2 mph (Exhibit 25-19)
S_0 = 73.7 mph (Exhibit 25-19)
S = 61.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 518 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5626	0.92	Level	7	0	0.966	1.00	6329
Ramp	274	0.92	Level	0	0	1.000	1.00	298
UpStream								
DownStream	518	0.92	Level	0	0	1.000	1.00	563

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.404 using Equation (Exhibit 25-5)
V_{12} = 2554 pc/h
V_3 or V_{av34} 1887 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6627	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2852	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 23.2 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.340 (Exibit 25-19)
S_R= 60.5 mph (Exhibit 25-19)
S_0= 65.0 mph (Exhibit 25-19)
S = 63.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1000 ft
V_u = 274 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5900	0.92	Level	7	0	0.966	1.00	6637
Ramp	518	0.92	Level	0	0	1.000	1.00	563
UpStream	274	0.92	Level	0	0	1.000	1.00	298
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.380 using Equation (Exhibit 25-5)
V_{12} = 2522 pc/h
V_3 or V_{av34} 2057 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes,V_{12a} = 2654 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7200	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3217	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 25.7 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.367 (Exibit 25-19)
S_R= 59.7 mph (Exhibit 25-19)
S_0= 64.6 mph (Exhibit 25-19)
S = 62.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1565 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5214	0.92	Level	7	0	0.966	1.00	5866
Ramp	948	0.92	Level	0	0	1.000	1.00	1030
UpStream								
DownStream	1565	0.92	Level	0	0	1.000	1.00	1701

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3138 pc/h
V_3 or V_{av34} 1364 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5866	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	4836	Exhibit 25-14	9600	No
V_R	1030	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3138	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 29.2 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.521 (Exhibit 25-19)
S_R= 55.4 mph (Exhibit 25-19)
S_0= 75.4 mph (Exhibit 25-19)
S = 63.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 948 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4266	0.92	Level	7	0	0.966	1.00	4799
Ramp	1565	0.92	Level	0	0	1.000	1.00	1701
UpStream	948	0.92	Level	0	0	1.000	1.00	1030
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.228 using Equation (Exhibit 25-5)

V_{12} = 1095 pc/h

V_3 or V_{av34} 1852 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1919 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6500	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3620	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 28.5 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.418 (Exibit 25-19)

S_R = 58.3 mph (Exhibit 25-19)

S_0 = 66.6 mph (Exhibit 25-19)

S = 61.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 138 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6955	0.92	Level	7	0	0.966	1.00	7824
Ramp	1439	0.92	Level	0	0	1.000	1.00	1564
UpStream								
DownStream	138	0.92	Level	0	0	1.000	1.00	150

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 4293 pc/h
V_3 or V_{av34} 1765 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7824	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6260	Exhibit 25-14	9600	No
V_R	1564	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4293	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 38.8 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.569 (Exhibit 25-19)
S_R = 54.1 mph (Exhibit 25-19)
S_0 = 73.8 mph (Exhibit 25-19)
S = 61.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 375 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5517	0.92	Level	7	0	0.966	1.00	6207
Ramp	138	0.92	Level	0	0	1.000	1.00	150
UpStream								
DownStream	375	0.92	Level	0	0	1.000	1.00	408

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.422 using Equation (Exhibit 25-5)
V_{12} = 2620 pc/h
V_3 or V_{av34} 1793 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6357	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2770	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.6 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.334 (Exibit 25-19)
S_R= 60.6 mph (Exhibit 25-19)
S_0= 65.3 mph (Exhibit 25-19)
S = 63.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1000 ft
V_u = 138 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5655	0.92	Level	7	0	0.966	1.00	6362
Ramp	375	0.92	Level	0	0	1.000	1.00	408
UpStream	138	0.92	Level	0	0	1.000	1.00	150
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.399 using Equation (Exhibit 25-5)
V_{12} = 2541 pc/h
V_3 or V_{av34} 1910 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes,V_{12a} = 2544 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6770	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2952	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 23.7 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.345 (Exibit 25-19)
S_R= 60.4 mph (Exhibit 25-19)
S_0= 64.9 mph (Exhibit 25-19)
S = 62.8 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1772 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5447	0.92	Level	7	0	0.966	1.00	6128
Ramp	600	0.92	Level	0	0	1.000	1.00	652
UpStream								
DownStream	1772	0.92	Level	0	0	1.000	1.00	1926

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3040 pc/h
V_3 or V_{av34} 1544 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6128	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5476	Exhibit 25-14	9600	No
V_R	652	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3040	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 28.3 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.487 (Exhibit 25-19)
S_R= 56.4 mph (Exhibit 25-19)
S_0= 74.7 mph (Exhibit 25-19)
S = 64.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 600 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4847	0.92	Level	7	0	0.966	1.00	5453
Ramp	1772	0.92	Level	0	0	1.000	1.00	1926
UpStream	600	0.92	Level	0	0	1.000	1.00	652
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.200 using Equation (Exhibit 25-5)

V_{12} = 1091 pc/h

V_3 or V_{av34} 2181 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2181 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7379	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4107	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 32.2 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.509 (Exibit 25-19)

S_R = 55.7 mph (Exhibit 25-19)

S_0 = 65.9 mph (Exhibit 25-19)

S = 59.8 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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I-210 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7819	0.92	Level	7	0	0.966	1.00	8796
Ramp	691	0.92	Level	0	0	1.000	1.00	751
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 4259 pc/h

V_3 or V_{av34} 2268 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8796	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	8045	Exhibit 25-14	9600	No
V_R	751	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4259	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 37.3 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.496 (Exhibit 25-19)

S_R = 56.1 mph (Exhibit 25-19)

S_0 = 71.8 mph (Exhibit 25-19)

S = 63.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7128	0.92	Level	7	0	0.966	1.00	8019
Ramp	617	0.92	Level	0	0	1.000	1.00	671
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.293 using Equation (Exhibit 25-5)
V_{12} = 2351 pc/h
V_3 or V_{av34} 2834 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2619 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8690	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3290	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.7 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.391 (Exibit 25-19)
S_R = 59.1 mph (Exhibit 25-19)
S_0 = 61.1 mph (Exhibit 25-19)
S = 60.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7145	0.92	Level	7	0	0.966	1.00	8038
Ramp	510	0.92	Level	0	0	1.000	1.00	554
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.372 using Equation (Exhibit 25-5)
V_{12} = 2987 pc/h
V_3 or V_{av34} 2525 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3215 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8592	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3769	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.2 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.441 (Exibit 25-19)
S_R = 57.7 mph (Exhibit 25-19)
S_0 = 62.8 mph (Exhibit 25-19)
S = 60.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8421	0.92	Level	7	0	0.966	1.00	9474
Ramp	1731	0.92	Level	0	0	1.000	1.00	1882
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 3856 pc/h

V_3 or V_{av34} 2809 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = 4074 pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9474	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7592	Exhibit 25-14	9600	No
V_R	1882	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3856	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 27.6 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.597 (Exhibit 25-19)

S_R = 53.3 mph (Exhibit 25-19)

S_0 = 70.2 mph (Exhibit 25-19)

S = 61.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6690	0.92	Level	7	0	0.966	1.00	7526
Ramp	556	0.92	Level	0	0	1.000	1.00	604
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.429 using Equation (Exhibit 25-5)

V_{12} = 3229 pc/h

V_3 or V_{av34} 2148 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8130	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3833	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.5 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.438 (Exibit 25-19)

S_R = 57.7 mph (Exhibit 25-19)

S_0 = 64.1 mph (Exhibit 25-19)

S = 60.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7929	0.92	Level	7	0	0.966	1.00	8920
Ramp	602	0.92	Level	0	0	1.000	1.00	654
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 4258 pc/h

V_3 or V_{av34} 2331 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8920	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	8266	Exhibit 25-14	9600	No
V_R	654	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4258	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 37.3 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.487 (Exhibit 25-19)

S_R = 56.4 mph (Exhibit 25-19)

S_0 = 71.6 mph (Exhibit 25-19)

S = 63.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7327	0.92	Level	7	0	0.966	1.00	8243
Ramp	520	0.92	Level	0	0	1.000	1.00	565
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)

L_{EQ} =

P_{FM} = 0.306 using Equation (Exhibit 25-5)

V_{12} = 2526 pc/h

V_3 or V_{av34} 2858 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2843 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8808	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3408	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.7 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.404 (Exibit 25-19)

S_R = 58.7 mph (Exhibit 25-19)

S_0 = 61.1 mph (Exhibit 25-19)

S = 60.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)

L_{EQ} =

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7487	0.92	Level	7	0	0.966	1.00	8423
Ramp	313	0.92	Level	0	0	1.000	1.00	340
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)

L_{EQ} =
P_{FM} = 0.398 using Equation (Exhibit 25-5)
V_{12} = 3355 pc/h
V_3 or V_{av34} 2534 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3369 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8763	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3709	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.9 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.431 (Exibit 25-19)
S_R = 57.9 mph (Exhibit 25-19)
S_0 = 62.1 mph (Exhibit 25-19)
S = 60.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)

L_{EQ} =
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8075	0.92	Level	7	0	0.966	1.00	9084
Ramp	933	0.92	Level	0	0	1.000	1.00	1014
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 3112 pc/h

V_3 or V_{av34} 2986 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3684 pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9084	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	8070	Exhibit 25-14	9600	No
V_R	1014	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3112	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 24.2 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.519 (Exhibit 25-19)

S_R = 55.5 mph (Exhibit 25-19)

S_0 = 70.2 mph (Exhibit 25-19)

S = 63.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7142	0.92	Level	7	0	0.966	1.00	8035
Ramp	1019	0.92	Level	0	0	1.000	1.00	1108
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.366 using Equation (Exhibit 25-5)

V_{12} = 2941 pc/h

V_3 or V_{av34} = 2547 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3214 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9143	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4322	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 33.0 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.552 (Exibit 25-19)

S_R = 54.5 mph (Exhibit 25-19)

S_0 = 62.8 mph (Exhibit 25-19)

S = 58.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

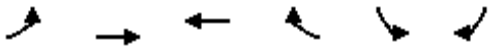
S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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Queuing Analysis Worksheets

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	514	1445	0	471	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						438
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	591	1661	0	541	549
v/c Ratio		0.22	0.89		0.92	0.34
Control Delay		8.3	21.6		44.8	0.6
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.3	21.6		44.8	0.6
Queue Length 50th (ft)		39	265		183	0
Queue Length 95th (ft)		55	#368		#334	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2671	1859		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.22	0.89		0.90	0.34

Intersection Summary	
Area Type:	Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	344	627	938	1483	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		454				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	366	667	998	1578	0	0
v/c Ratio	0.34	0.41	1.07	0.44		
Control Delay	17.4	0.8	66.1	0.3		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	17.4	0.8	66.1	0.3		
Queue Length 50th (ft)	53	0	~419	0		
Queue Length 95th (ft)	85	0	#631	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.34	0.41	1.07	0.44		

Intersection Summary

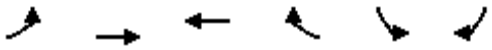
Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	49
Average Queue (ft)	435	374	10
95th Queue (ft)	513	374	42
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	74	87	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	956	412	0	346	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						289
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1086	468	0	393	289
v/c Ratio		0.38	0.23		0.77	0.18
Control Delay		8.4	7.8		30.0	0.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.4	7.8		30.0	0.2
Queue Length 50th (ft)		75	42		125	0
Queue Length 95th (ft)		106	68		197	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2885	2008		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.38	0.23		0.66	0.18

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1036	1046	725	1005	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		500				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1091	1101	763	1058	0	0
v/c Ratio	1.01	0.68	0.82	0.29		
Control Delay	52.9	2.3	21.1	0.2		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	52.9	2.3	21.1	0.2		
Queue Length 50th (ft)	~208	0	213	0		
Queue Length 95th (ft)	#335	0	#422	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	1.01	0.68	0.82	0.29		

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	26
Average Queue (ft)	459	373	5
95th Queue (ft)	459	378	22
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	90	72	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

APPENDIX S

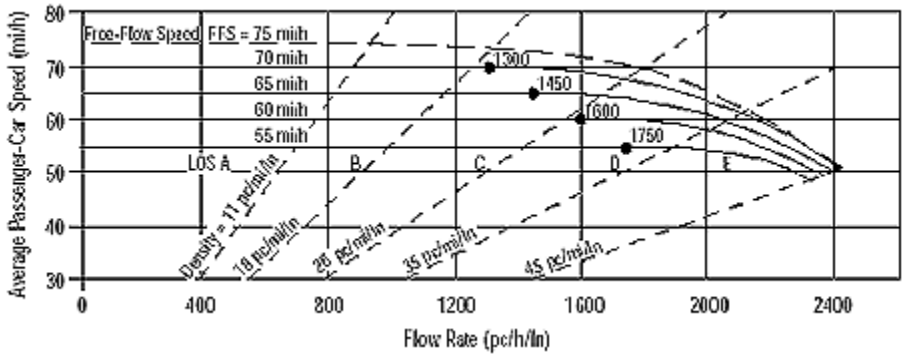
Long Range (2035) With Project
HCS+ Freeway Segment, HCS+ Ramp Junction,
and Queuing Analysis Worksheets

HCS+ Freeway Segment Analysis Worksheets

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I-605 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7146*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2010*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*31.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

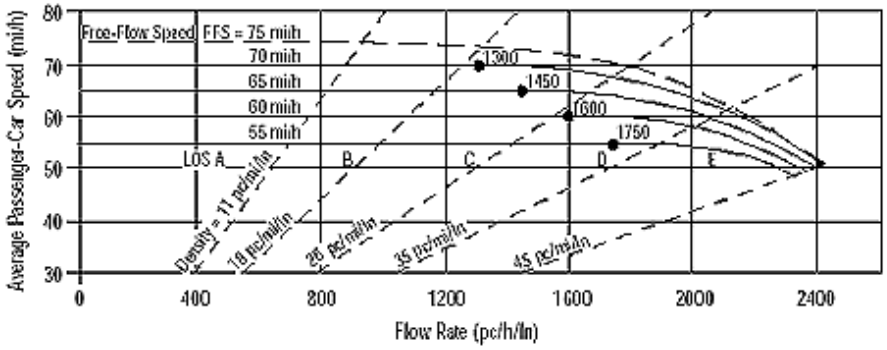
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5626*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1582*	pc/h/ln
S	*69.5*	mi/h
D = v_p / S	*22.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

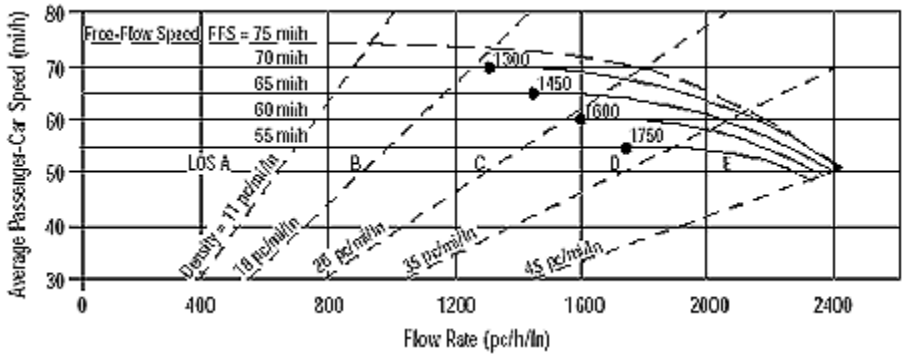
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5900*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1659*	pc/h/ln
S	*69.1*	mi/h
D = v_p / S	*24.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

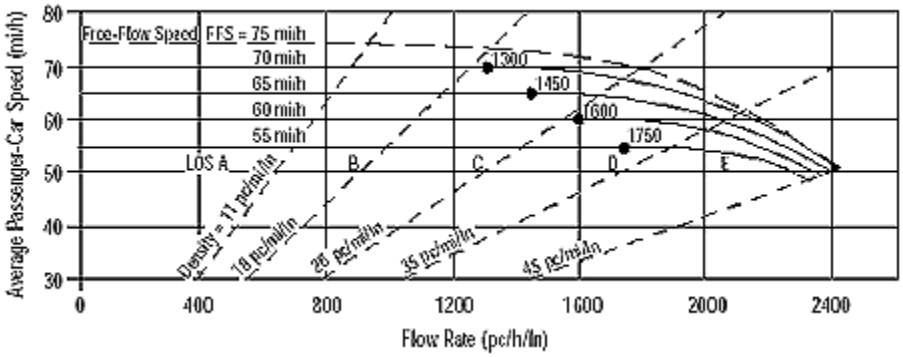
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6568*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1847*	pc/h/ln
S	*67.3*	mi/h
D = v_p / S	*27.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

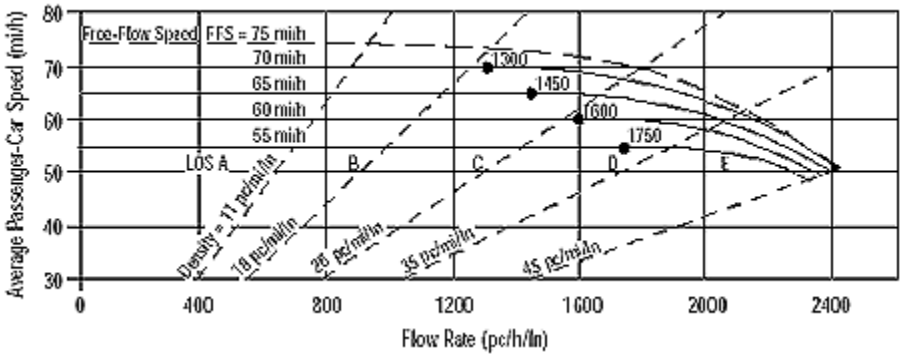
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5371*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1511*	pc/h/ln
S	*69.8*	mi/h
D = v_p / S	*21.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

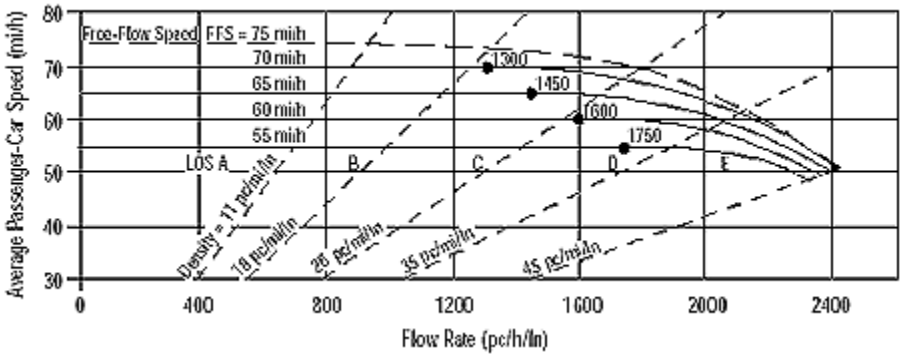
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4266*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1200*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*17.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

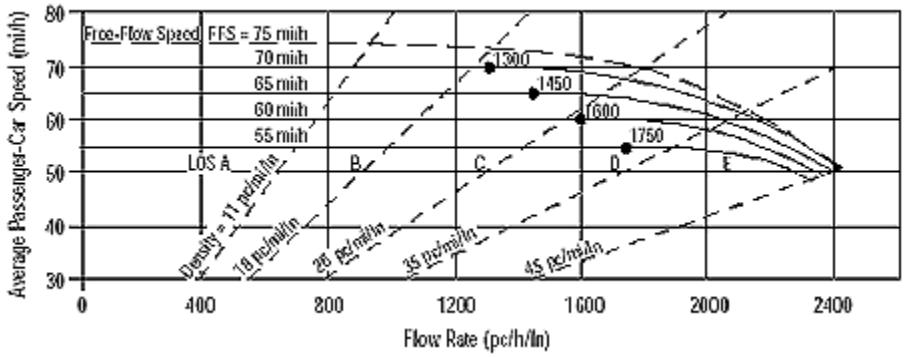
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5945*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1672*	pc/h/ln
S	*69.0*	mi/h
D = v_p / S	*24.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

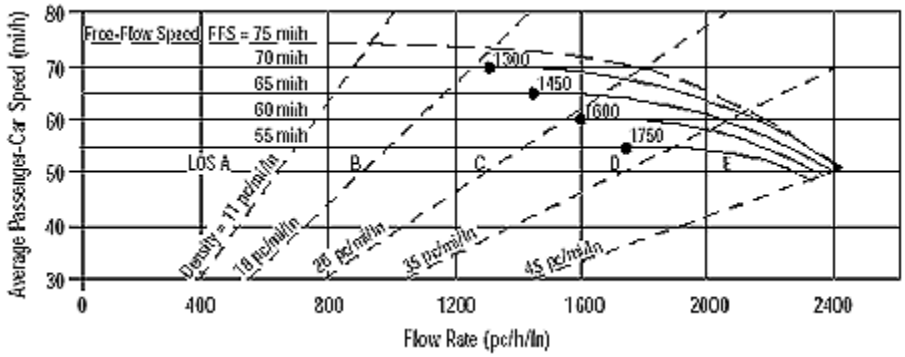
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*South of Live Oak Ave*
Date Performed	*6/17/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7084*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1992*	pc/h/ln	Design LOS		
S	*65.0*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*30.6*	pc/mi/ln	S		mi/h
LOS	*D*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

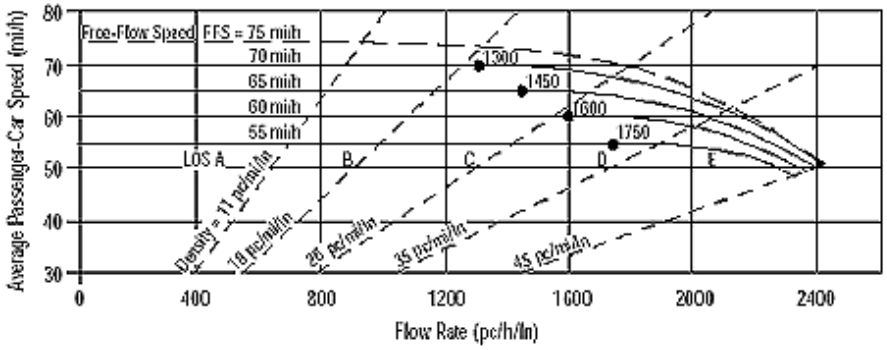
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW Live Oak and EB Arrw Lp On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5517*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1552*	pc/h/ln
S	*69.6*	mi/h
D = v_p / S	*22.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

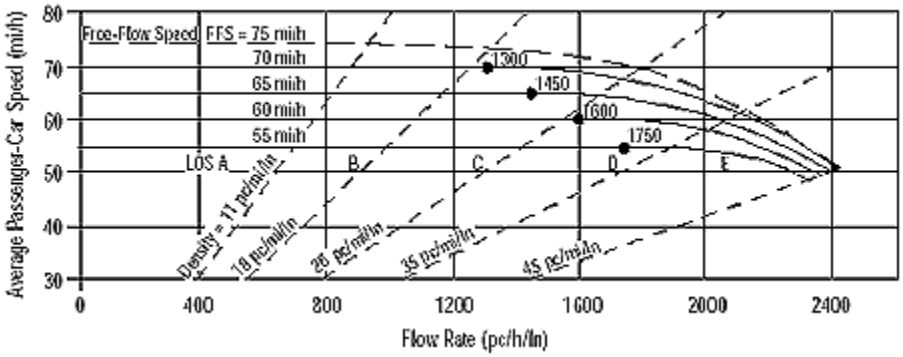
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW EB Arrw Lp On and WB On*
Date Performed	*6/17/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5655*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1590*	pc/h/ln
S	*69.5*	mi/h
D = v_p / S	*22.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

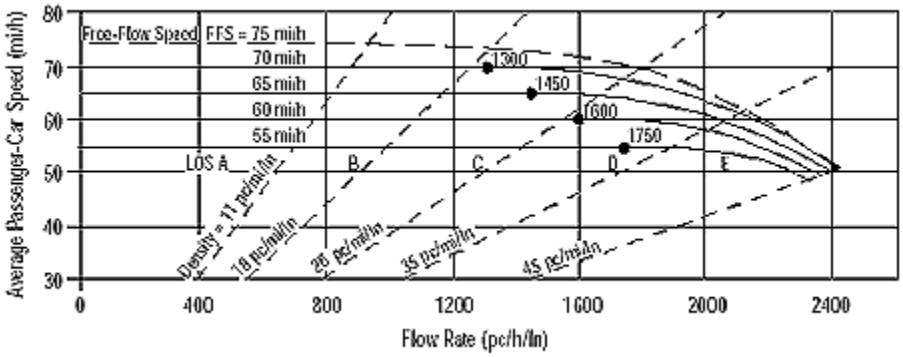
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6171*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1736*	pc/h/ln
S	*68.5*	mi/h
D = v_p / S	*25.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

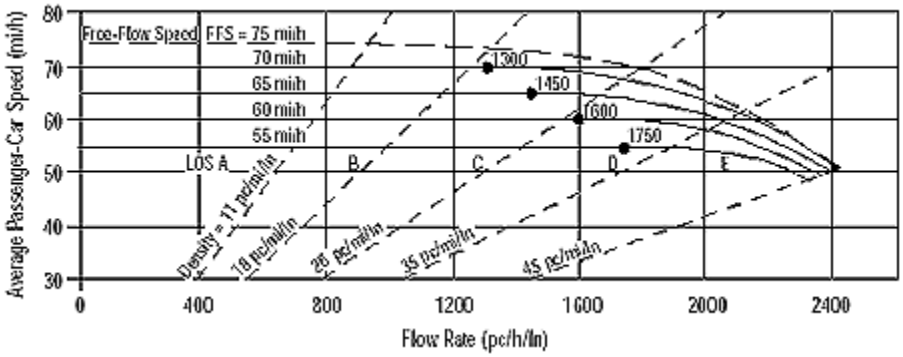
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5589*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1572*	pc/h/ln
S	*69.6*	mi/h
D = v_p / S	*22.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

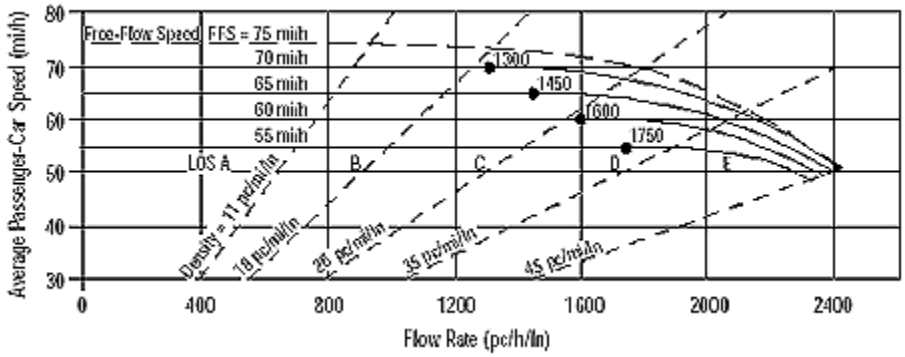
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4847*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1363*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*19.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

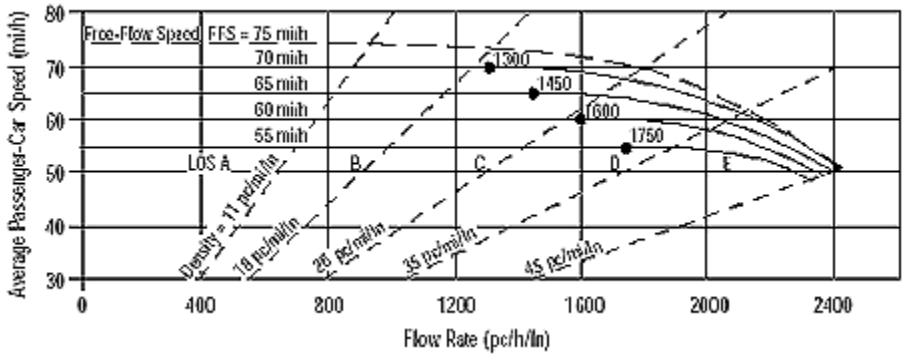
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6739*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1895*	pc/h/ln
S	*66.6*	mi/h
D = v_p / S	*28.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

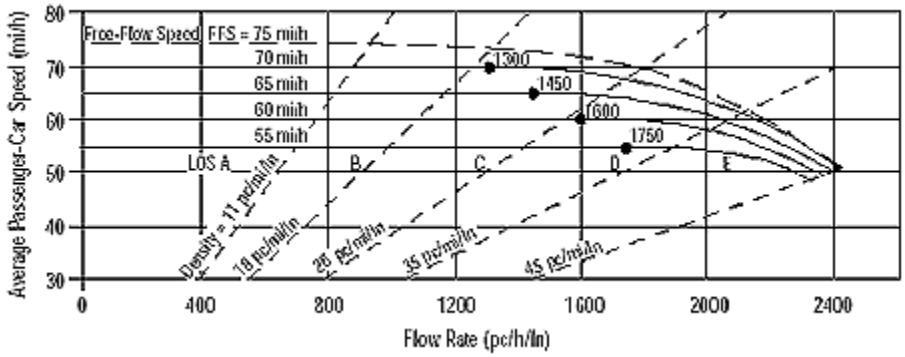
Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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I-210 Freeway Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*East of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7897*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2221*	pc/h/ln
S	*59.5*	mi/h
D = v_p / S	*37.3*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

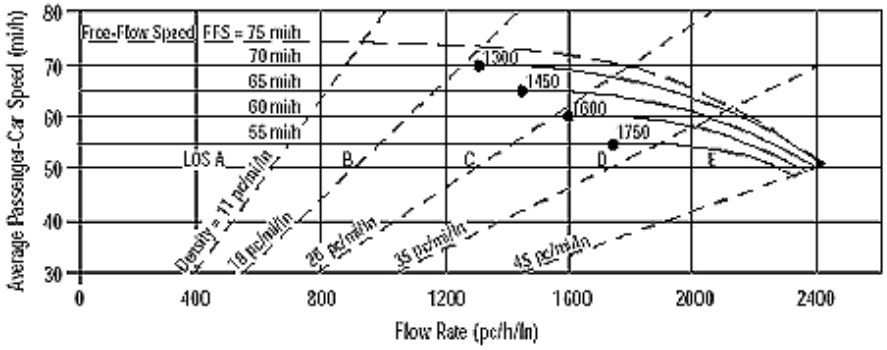
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*BW Irwindale Off & Loop OnRamp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7201*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2025*	pc/h/ln
S	*64.4*	mi/h
D = v_p / S	*31.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

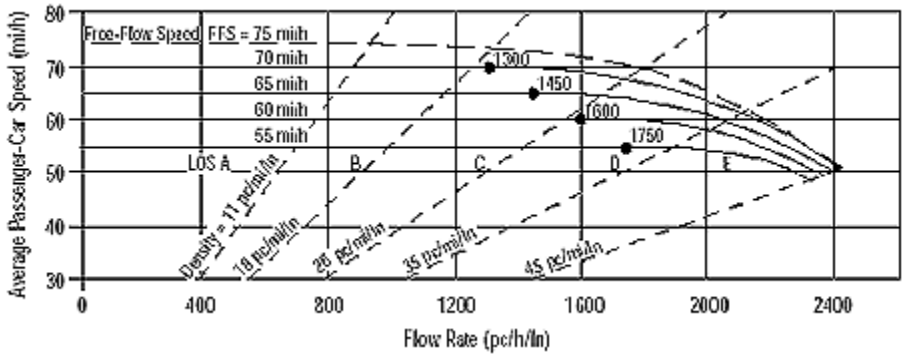
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*West of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8328*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2342*	pc/h/ln
S	*55.5*	mi/h
D = v_p / S	*42.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

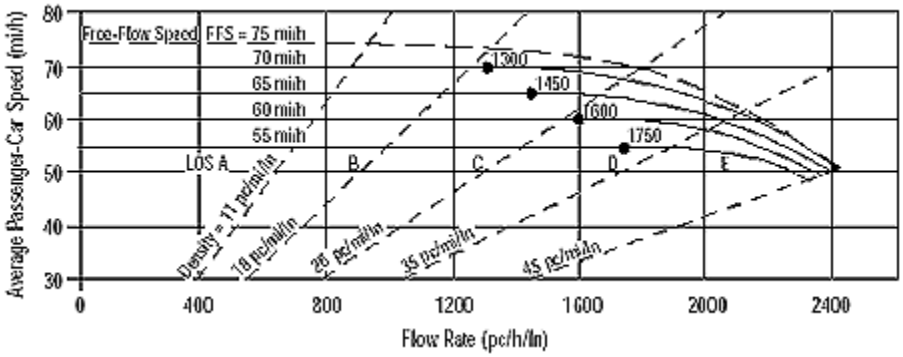
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*West of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8494*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2389*	pc/h/ln
S	*53.8*	mi/h
D = v_p / S	*44.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

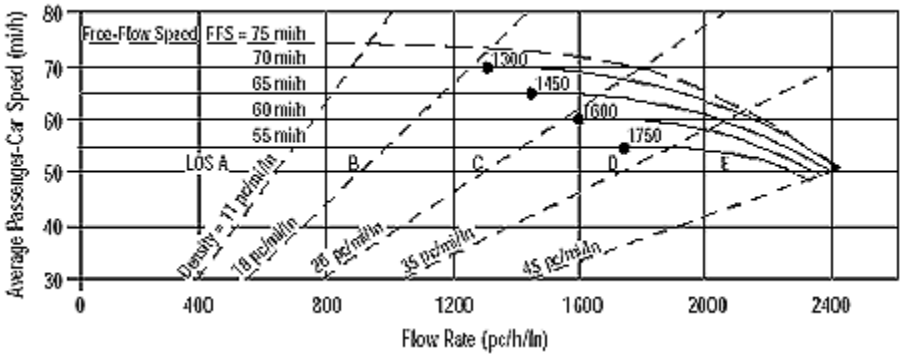
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*BW Irwindale Off & On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6763*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1902*	pc/h/ln
S	*66.5*	mi/h
D = v_p / S	*28.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

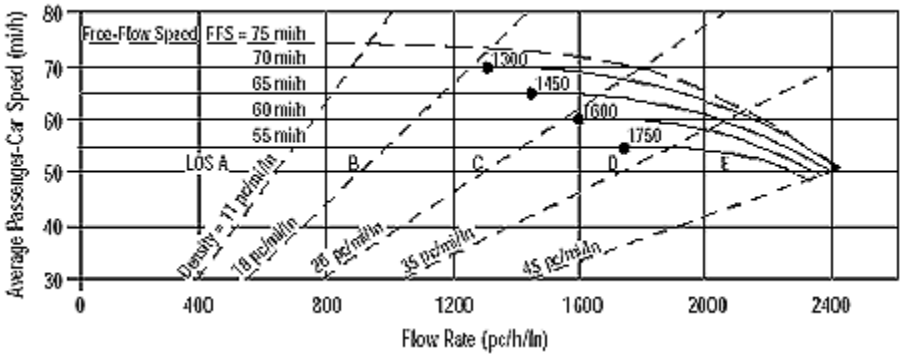
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7323*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2060*	pc/h/ln
S	*63.6*	mi/h
D = v_p / S	*32.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

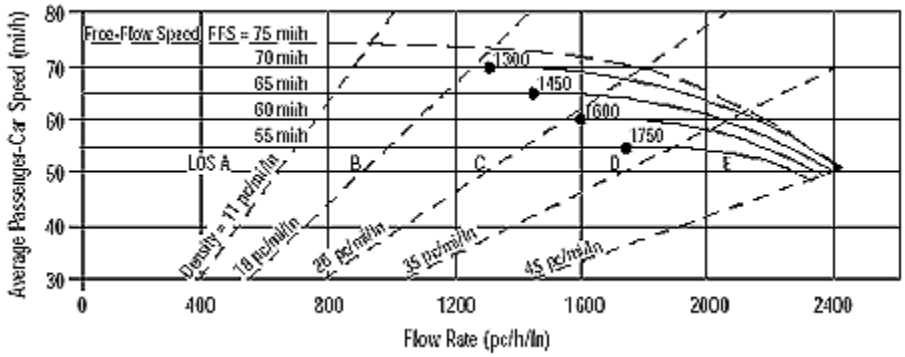
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7996*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

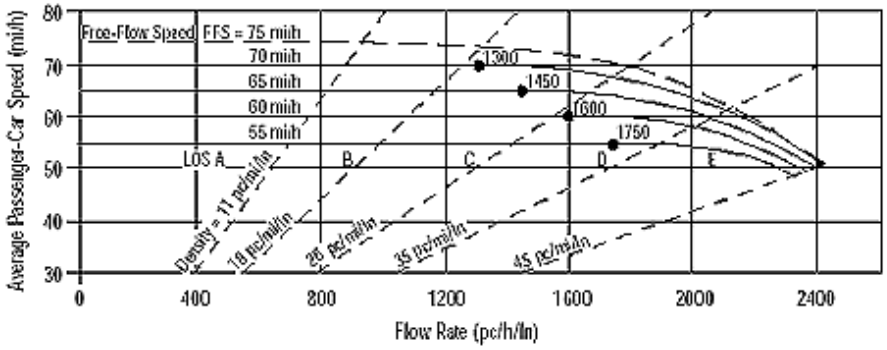
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2249*	pc/h/ln	Design LOS		
S	*58.6*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*38.3*	pc/mi/ln	S		mi/h
LOS	*E*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7389*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2078*	pc/h/ln
S	*63.2*	mi/h
D = v_p / S	*32.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

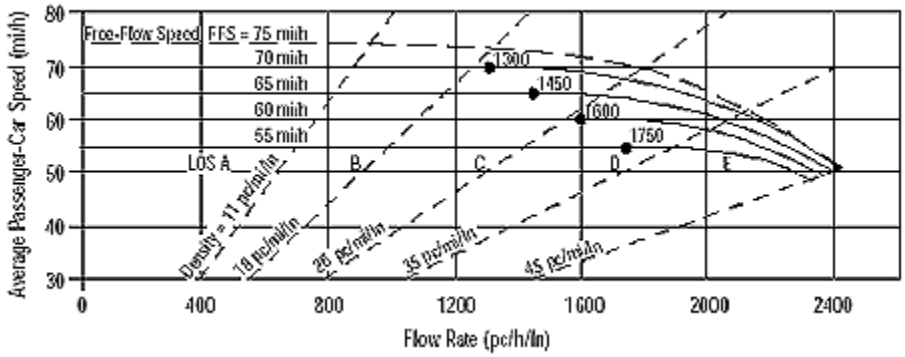
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8222*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2312*	pc/h/ln	Design LOS		
S	*56.6*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*40.9*	pc/mi/ln	S		mi/h
LOS	*E*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

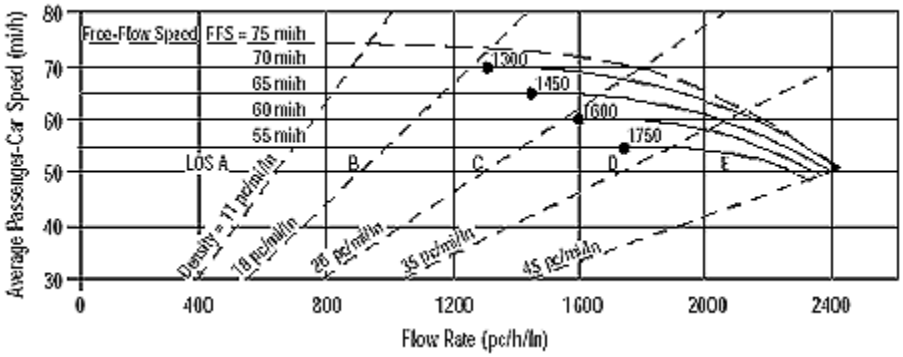
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*West of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8138*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2289*	pc/h/ln
S	*57.4*	mi/h
D = v_p / S	*39.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

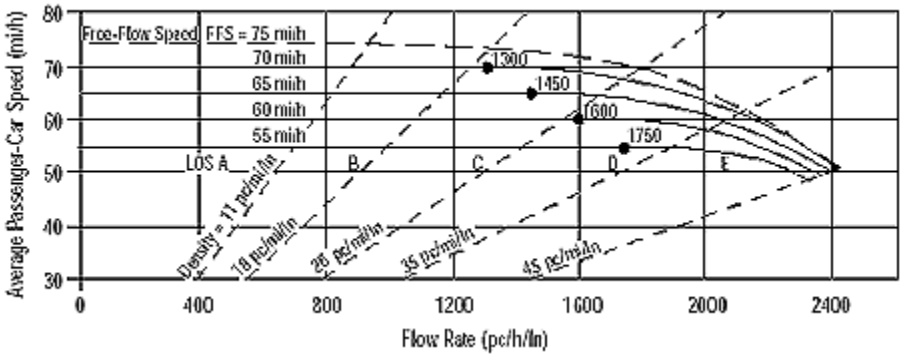
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DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*BW Irwindale Off & On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7205*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2026*	pc/h/ln
S	*64.3*	mi/h
D = v_p / S	*31.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

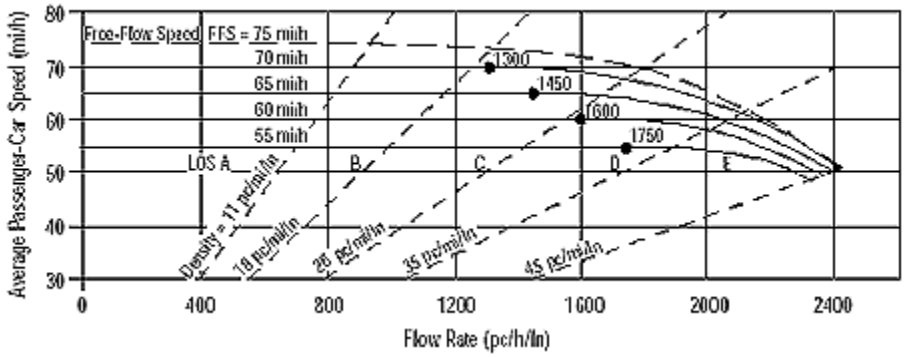
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8229*	veh/h	Peak-Hour Factor, PHF	*0.92*	
AADT		veh/day	%Trucks and Buses, P_T	*7*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2314*	pc/h/ln
S	*56.5*	mi/h
D = v_p / S	*40.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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HCS+ Ramp Junction Analysis Worksheets

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I-605 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 274 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7146	0.92	Level	7	0	0.966	1.00	8039
Ramp	1520	0.92	Level	0	0	1.000	1.00	1652
UpStream								
DownStream	274	0.92	Level	0	0	1.000	1.00	298

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 4437 pc/h
V_3 or V_{av34} 1801 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8039	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6387	Exhibit 25-14	9600	No
V_R	1652	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4437	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 40.1 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.577 (Exhibit 25-19)
S_R= 53.9 mph (Exhibit 25-19)
S_0= 73.7 mph (Exhibit 25-19)
S = 61.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 668 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5626	0.92	Level	7	0	0.966	1.00	6329
Ramp	274	0.92	Level	0	0	1.000	1.00	298
UpStream								
DownStream	668	0.92	Level	0	0	1.000	1.00	726

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.404 using Equation (Exhibit 25-5)
V_{12} = 2554 pc/h
V_3 or V_{av34} 1887 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6627	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2852	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 23.2 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.340 (Exibit 25-19)
S_R= 60.5 mph (Exhibit 25-19)
S_0= 65.0 mph (Exhibit 25-19)
S = 63.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1000 ft

V_u = 274 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5900	0.92	Level	7	0	0.966	1.00	6637
Ramp	668	0.92	Level	0	0	1.000	1.00	726
UpStream	274	0.92	Level	0	0	1.000	1.00	298
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.360 using Equation (Exhibit 25-5)

V_{12} = 2387 pc/h

V_3 or V_{av34} 2125 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2654 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7363	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3380	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 26.9 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.384 (Exibit 25-19)

S_R = 59.2 mph (Exhibit 25-19)

S_0 = 64.6 mph (Exhibit 25-19)

S = 62.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1679 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5371	0.92	Level	7	0	0.966	1.00	6042
Ramp	1105	0.92	Level	0	0	1.000	1.00	1201
UpStream								
DownStream	1679	0.92	Level	0	0	1.000	1.00	1825

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3312 pc/h
V_3 or V_{av34} 1365 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6042	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	4841	Exhibit 25-14	9600	No
V_R	1201	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3312	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 30.7 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.536 (Exhibit 25-19)
S_R= 55.0 mph (Exhibit 25-19)
S_0= 75.4 mph (Exhibit 25-19)
S = 62.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 1105 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4266	0.92	Level	7	0	0.966	1.00	4799
Ramp	1679	0.92	Level	0	0	1.000	1.00	1825
UpStream	1105	0.92	Level	0	0	1.000	1.00	1201
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.213 using Equation (Exhibit 25-5)

V_{12} = 1021 pc/h

V_3 or V_{av34} 1889 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1919 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6624	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3744	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 29.4 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.437 (Exibit 25-19)

S_R = 57.8 mph (Exhibit 25-19)

S_0 = 66.6 mph (Exhibit 25-19)

S = 61.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4400 ft
V_D = 138 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7084	0.92	Level	7	0	0.966	1.00	7969
Ramp	1568	0.92	Level	0	0	1.000	1.00	1704
UpStream								
DownStream	138	0.92	Level	0	0	1.000	1.00	150

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 4436 pc/h
V_3 or V_{av34} 1766 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7969	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6265	Exhibit 25-14	9600	No
V_R	1704	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4436	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 40.1 (pc/mi/ln)
LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.581 (Exhibit 25-19)
S_R= 53.7 mph (Exhibit 25-19)
S_0= 73.8 mph (Exhibit 25-19)
S = 61.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1000 ft
V_D = 516 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5517	0.92	Level	7	0	0.966	1.00	6207
Ramp	138	0.92	Level	0	0	1.000	1.00	150
UpStream								
DownStream	516	0.92	Level	0	0	1.000	1.00	561

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.422 using Equation (Exhibit 25-5)
V_{12} = 2620 pc/h
V_3 or V_{av34} 1793 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6357	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2770	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.6 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.334 (Exibit 25-19)
S_R= 60.6 mph (Exhibit 25-19)
S_0= 65.3 mph (Exhibit 25-19)
S = 63.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1000 ft
V_u = 138 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5655	0.92	Level	7	0	0.966	1.00	6362
Ramp	516	0.92	Level	0	0	1.000	1.00	561
UpStream	138	0.92	Level	0	0	1.000	1.00	150
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.380 using Equation (Exhibit 25-5)
V_{12} = 2419 pc/h
V_3 or V_{av34} 1971 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes,V_{12a} = 2544 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6923	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3105	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 24.9 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.357 (Exibit 25-19)
S_R= 60.0 mph (Exhibit 25-19)
S_0= 64.9 mph (Exhibit 25-19)
S = 62.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1892 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5589	0.92	Level	7	0	0.966	1.00	6288
Ramp	742	0.92	Level	0	0	1.000	1.00	807
UpStream								
DownStream	1892	0.92	Level	0	0	1.000	1.00	2057

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.436 using Equation (Exhibit 25-12)
V_{12} = 3197 pc/h
V_3 or V_{av34} 1545 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6288	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5481	Exhibit 25-14	9600	No
V_R	807	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3197	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 29.7 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.501 (Exhibit 25-19)
S_R= 56.0 mph (Exhibit 25-19)
S_0= 74.7 mph (Exhibit 25-19)
S = 63.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 4300 ft

V_u = 742 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4847	0.92	Level	7	0	0.966	1.00	5453
Ramp	1892	0.92	Level	0	0	1.000	1.00	2057
UpStream	742	0.92	Level	0	0	1.000	1.00	807
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.184 using Equation (Exhibit 25-5)

V_{12} = 1002 pc/h

V_3 or V_{av34} 2225 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2181 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7510	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4238	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 33.2 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.542 (Exibit 25-19)

S_R = 54.8 mph (Exhibit 25-19)

S_0 = 65.9 mph (Exhibit 25-19)

S = 59.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.0009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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I-210 Freeway Analysis

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7897	0.92	Level	7	0	0.966	1.00	8884
Ramp	696	0.92	Level	0	0	1.000	1.00	757
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 4300 pc/h

V_3 or V_{av34} 2292 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8884	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	8127	Exhibit 25-14	9600	No
V_R	757	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4300	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

D_R = 37.6 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.496 (Exhibit 25-19)

S_R = 56.1 mph (Exhibit 25-19)

S_0 = 71.8 mph (Exhibit 25-19)

S = 63.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7201	0.92	Level	7	0	0.966	1.00	8101
Ramp	617	0.92	Level	0	0	1.000	1.00	671
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.293 using Equation (Exhibit 25-5)
V_{12} = 2375 pc/h
V_3 or V_{av34} 2863 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2701 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8772	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3372	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = 28.3 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.400 (Exibit 25-19)
S_R = 58.8 mph (Exhibit 25-19)
S_0 = 61.1 mph (Exhibit 25-19)
S = 60.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7818	0.92	Level	7	0	0.966	1.00	8795
Ramp	510	0.92	Level	0	0	1.000	1.00	554
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 25-2 or 25-3)

L_{EQ} =

P_{FM} = 0.372 using Equation (Exhibit 25-5)

V_{12} = 3268 pc/h

V_3 or V_{av34} 2763 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3395 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9349	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3949	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.6 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.474 (Exibit 25-19)

S_R = 56.7 mph (Exhibit 25-19)

S_0 = 61.1 mph (Exhibit 25-19)

S = 59.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 25-8 or 25-9)

L_{EQ} =

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8494	0.92	Level	7	0	0.966	1.00	9556
Ramp	1731	0.92	Level	0	0	1.000	1.00	1882
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 3877 pc/h

V_3 or V_{av34} 2839 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = 4156 pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9556	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	7674	Exhibit 25-14	9600	No
V_R	1882	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3877	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 28.3 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.597 (Exhibit 25-19)

S_R = 53.3 mph (Exhibit 25-19)

S_0 = 70.2 mph (Exhibit 25-19)

S = 61.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6763	0.92	Level	7	0	0.966	1.00	7608
Ramp	560	0.92	Level	0	0	1.000	1.00	609
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.428 using Equation (Exhibit 25-5)

V_{12} = 3259 pc/h

V_3 or V_{av34} 2174 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8217	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3868	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.7 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.445 (Exibit 25-19)

S_R = 57.6 mph (Exhibit 25-19)

S_0 = 64.0 mph (Exhibit 25-19)

S = 60.8 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035WP
Project Description	Irwindale MRF & Transfer Station TIA (JN 08517)		

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7996	0.92	Level	7	0	0.966	1.00	8995
Ramp	607	0.92	Level	0	0	1.000	1.00	660
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 4294 pc/h

V_3 or V_{av34} 2350 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8995	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	8335	Exhibit 25-14	9600	No
V_R	660	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4294	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

D_R = 37.6 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Speed Determination

D_s = 0.487 (Exhibit 25-19)

S_R = 56.4 mph (Exhibit 25-19)

S_0 = 71.5 mph (Exhibit 25-19)

S = 63.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7389	0.92	Level	7	0	0.966	1.00	8313
Ramp	520	0.92	Level	0	0	1.000	1.00	565
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.306 using Equation (Exhibit 25-5)
V_{12} = 2548 pc/h
V_3 or V_{av34} 2882 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2913 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8878	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3478	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = 29.2 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.412 (Exibit 25-19)
S_R = 58.5 mph (Exhibit 25-19)
S_0 = 61.1 mph (Exhibit 25-19)
S = 60.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7909	0.92	Level	7	0	0.966	1.00	8898
Ramp	313	0.92	Level	0	0	1.000	1.00	340
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.398 using Equation (Exhibit 25-5)
V_{12} = 3544 pc/h
V_3 or V_{av34} 2677 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3559 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9238	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3899	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = 31.3 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.464 (Exibit 25-19)
S_R = 57.0 mph (Exhibit 25-19)
S_0 = 61.3 mph (Exhibit 25-19)
S = 59.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = using Equation (Exhibit 25-12)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)
S_0 = mph (Exhibit 25-19)
S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035WP
Project Description	Irwindale MRF & Transfer Station TIA (JN 08517)		

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☑ No ☐ Off		☑ No ☐ Off
L_{up} = ft		L_{down} = ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8138	0.92	Level	7	0	0.966	1.00	9155
Ramp	933	0.92	Level	0	0	1.000	1.00	1014
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 using Equation (Exhibit 25-12)

V_{12} = 3131 pc/h

V_3 or V_{av34} 3012 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3755 pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9155	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	8141	Exhibit 25-14	9600	No
V_R	1014	Exhibit 25-3	3800	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3131	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = 24.8 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.519 (Exhibit 25-19)

S_R = 55.5 mph (Exhibit 25-19)

S_0 = 70.2 mph (Exhibit 25-19)

S = 63.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7205	0.92	Level	7	0	0.966	1.00	8106
Ramp	1024	0.92	Level	0	0	1.000	1.00	1113
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.365 using Equation (Exhibit 25-5)

V_{12} = 2962 pc/h

V_3 or V_{av34} = 2572 pc/h (Equation 25-4 or 25-5)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3242 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9219	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4355	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 33.3 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.562 (Exibit 25-19)

S_R = 54.3 mph (Exhibit 25-19)

S_0 = 62.7 mph (Exhibit 25-19)

S = 58.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.0009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

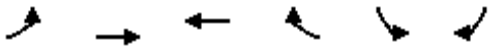
S_0 = mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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Queuing Analysis Worksheets

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	523	1455	0	628	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						438
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	601	1672	0	722	549
v/c Ratio		0.23	0.91		1.21	0.34
Control Delay		8.5	23.2		131.8	0.6
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.5	23.2		131.8	0.6
Queue Length 50th (ft)		40	267		~329	0
Queue Length 95th (ft)		56	#405		#488	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2636	1835		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.23	0.91		1.21	0.34

Intersection Summary	
Area Type:	Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	349	627	1052	1485	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		439				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	371	667	1119	1580	0	0
v/c Ratio	0.34	0.41	1.20	0.44		
Control Delay	17.5	0.8	117.9	0.3		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	17.5	0.8	117.9	0.3		
Queue Length 50th (ft)	54	0	~516	0		
Queue Length 95th (ft)	86	0	#719	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.34	0.41	1.20	0.44		

Intersection Summary

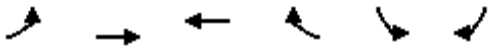
Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	50
Average Queue (ft)	371	325	10
95th Queue (ft)	562	485	43
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	55	56	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	970	424	0	488	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5187	3610	0	1805	1615
Flt Permitted					0.950	
Satd. Flow (perm)	0	5187	3610	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						289
Link Speed (mph)		45	45		30	
Link Distance (ft)		203	374		706	
Travel Time (s)		3.1	5.7		16.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1102	482	0	555	289
v/c Ratio		0.42	0.26		0.94	0.18
Control Delay		9.7	8.8		47.0	0.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		9.7	8.8		47.0	0.2
Queue Length 50th (ft)		83	47		190	0
Queue Length 95th (ft)		108	70		#352	0
Internal Link Dist (ft)		123	294		626	
Turn Bay Length (ft)						
Base Capacity (vph)		2652	1846		598	1615
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.42	0.26		0.93	0.18

Intersection Summary	
Area Type:	Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1039	1046	845	1008	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3610	1615	1805	3610	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3610	1615	1805	3610	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		472				
Link Speed (mph)	45			45	30	
Link Distance (ft)	2038			347	524	
Travel Time (s)	30.9			5.3	11.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	1.00	1.00
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1094	1101	889	1061	0	0
v/c Ratio	1.01	0.68	0.96	0.29		
Control Delay	53.7	2.3	36.6	0.2		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	53.7	2.3	36.6	0.2		
Queue Length 50th (ft)	~210	0	281	0		
Queue Length 95th (ft)	#336	0	#533	0		
Internal Link Dist (ft)	1958			267	444	
Turn Bay Length (ft)			360			
Base Capacity (vph)	1083	1615	929	3610		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	1.01	0.68	0.96	0.29		

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 8: Live Oak Av. (EW) & I-605 NB Off-Ramps (NS)

Movement	EB	WB	NW
Directions Served	R	R	T
Maximum Queue (ft)	459	374	26
Average Queue (ft)	459	340	5
95th Queue (ft)	459	454	23
Link Distance (ft)	444	359	98
Upstream Blk Time (%)	92	69	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

16: Driveway 1 (EW) & Arrow Hwy. (NS)



Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	431	170	10	1821	255	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)			60		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3610	1615	1805	3610	1805	1615
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3610	1615	1805	3610	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		179				13
Link Speed (mph)	45			45	30	
Link Distance (ft)	183			230	345	
Travel Time (s)	2.8			3.5	7.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	454	179	11	1917	268	13
v/c Ratio	0.18	0.15	0.11	0.73	0.77	0.04
Control Delay	5.0	0.7	46.8	11.3	52.4	14.7
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	5.0	0.7	46.8	11.5	52.4	14.7
Queue Length 50th (ft)	41	0	7	334	162	0
Queue Length 95th (ft)	50	6	m9	363	240	15
Internal Link Dist (ft)	103			150	265	
Turn Bay Length (ft)			100			
Base Capacity (vph)	2562	1198	99	2620	433	397
Starvation Cap Reductn	0	0	0	178	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.15	0.11	0.79	0.62	0.03

Intersection Summary	
Area Type:	Other

m Volume for 95th percentile queue is metered by upstream signal.

16: Driveway 1 (EW) & Arrow Hwy. (NS)



Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1025	219	15	592	235	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)			60		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3610	1615	1805	3610	1805	1615
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3610	1615	1805	3610	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		231				14
Link Speed (mph)	45			45	30	
Link Distance (ft)	183			230	345	
Travel Time (s)	2.8			3.5	7.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1079	231	16	623	247	14
v/c Ratio	0.44	0.20	0.14	0.24	0.72	0.04
Control Delay	8.1	1.0	45.3	5.2	49.6	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	1.0	45.3	5.2	49.6	14.2
Queue Length 50th (ft)	113	0	10	57	149	0
Queue Length 95th (ft)	236	13	m27	80	215	16
Internal Link Dist (ft)	103			150	265	
Turn Bay Length (ft)			100			
Base Capacity (vph)	2469	1177	120	2635	541	494
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.20	0.13	0.24	0.46	0.03

Intersection Summary	
Area Type:	Other

m Volume for 95th percentile queue is metered by upstream signal.

Appendix H
Southern California Association of Governments IRG Criteria

PROGRAMS & PROJECTS
Compass Blueprint
Clean Cities
Environment
Air Quality
Energy
Environmental Impact Reports
Environmental Justice
Intergovernmental Review
Solid & Hazardous Waste Management
Water
Housing
Local Profiles
Overall Work Program
Regional Comprehensive Plan
Federal Transportation Improvement Program
Regional Transportation Plan
State of the Region
Strategic Plan
Transportation

REGIONAL COUNCIL
Districts & Representatives
Executive Officers
Governing Structure

LEGISLATION
California Legislative Matrix
State & Federal Programs
Find Your Representative

DATA SERVICES
Demographics, Trends & Statistics
Emergency Information Network
Goods Movement Database
Integrated Growth Forecast
Mapping & GIS
Transportation Modeling
Scenario Planning Model (SPM)

MEDIA & COMMUNICATIONS
Press Room
Publications & Reports

Criteria List

The criteria for projects of regional significance are outlined in the CEQA Guidelines, Sections 15125 and 15206, and projects that directly relate to the policies and strategies contained in the Regional Comprehensive Plan and Guide and the Regional Transportation Plan.

MINIMUM CRITERIA FOR CLASSIFICATION OF PROJECTS AS REGIONALLY SIGNIFICANT
Intergovernmental Review Procedures Handbook – November 1995

Criteria 1-12 are recommended for use by the California Environmental Quality Act (CEQA) Guidelines, Section 15206. Criteria 13-22 reflect SCAG's mandates and regionally significant projects that directly relate to policies and strategies contained in the RCPG.

CEQA REQUIREMENTS

1. A proposed local general plan, element, or amendment thereof for which an EIR was prepared.
2. A proposed residential development of more than 500 dwelling units.
3. A proposed shopping center or business establishment employing more than 1,000 persons or encompassing more than 500,000 square feet of floor space.
4. A proposed commercial office building employing more than 1,000 persons or encompassing more than 250,000 square feet of floor space.
5. A proposed hotel/motel of more than 500 rooms.
6. A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or encompassing more than 650,000 square feet of floor area.

TRANSPORTATION

13. Construction or expansion of freeways; state highways; principle arterials; routes that provide primary access to major activity centers, such as amusement parks, regional shopping centers, military bases, airports, and ports; goods movement routes, including both truck routes and rail lines; intermodal transfer facilities, such as transit centers, rail stations, airports, and ports; and fixed transit routes, such as light and heavy rail, and commuter rail.

PUBLIC SERVICES/UTILITIES

14. New or expanded electrical generating facilities and transmission lines.
15. Petroleum-related recovery operations, storage facilities or expansion of existing facilities and pipelines that are part of a regional or national distribution system.
16. Flood control projects, dams, reservoirs or debris basins on or affecting a major body of water that has a tributary area of 20,000 acres at the county line; or facilities on a drainage course having a tributary basin of 50,000 acres and draining directly into the ocean.

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7. A project that would result in the cancellation of a Williamson Act Contract for any parcel of 100 or more acres.
8. A project for which an EIR was prepared and which is located in and substantially impacting an area of critical environmental sensitivity. This includes the California Coastal Zone.
9. A project that would substantially affect sensitive wildlife habitats such as riparian lands, wetlands, bays, estuaries, marshes, and habitats for rare and endangered species.
10. A project that would interfere with the attainment of regional water quality standards as stated in the approved areawide wastewater management plan.
11. A project that would provide housing, jobs, or occupancy for 500 or more people within 10 miles of a nuclear power plant.
12. A project that has the potential for causing significant effects on the environment extending beyond the city or county in which the project would be located.
17. Regional water management plans.
18. Sewage treatment facilities with a capacity of 750,000 gallons per day, of the expansion of an existing facility by that much, and any proposed interceptor.
19. Water treatment facilities with a capacity of 225,000 gallons per day, or the expansion of an existing facility by that much, and proposed major arterial water mains.
20. Proposed solid waste disposal sites in excess of 40 acres or the expansion of these facilities by 40 acres.
21. Regional waste management plans.

OTHER PROJECTS

22. Air quality regulatory plans.

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Appendix I
Noise Calculations

Traffic Noise Level Estimates Last Update October 2013

ROAD SEGMENT #1: Arrow Highway, west of Rivergrade Road	TOTAL # VEHICLE PCE proof	TOTAL # VEHICLE PCE	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto k/h	MT k/h	HT k/h	Distance to Receptor (Meters)	Attenuation (3.0 or 4.5)	Calculated dBA
Existing (2013)	1,555	1,555	95	1,477	2	31	3	47	45 72	45 72	45 72	15	3.0	72.1
Project Trips	307	307	53	163	40	123	7	21	45 72	45 72	45 72	15	3.0	69.4
Existing+Project Trips	1,862	1,862	88	1,640	8	154	4	68	45 72	45 72	45 72	15	3.0	74.0
2016 No Project	1,870	1,870	95	1,777	2	37	3	56	45 72	45 72	45 72	15	3.0	72.9
2016 + Project	2,177	2,177	89	1,939	7	160	4	78	45 72	45 72	45 72	15	3.0	74.5
2035 No Project	1,940	1,940	95	1,843	2	39	3	58	45 72	45 72	45 72	15	3.0	73.1
2035 + Project	2,247	2,247	89	2,006	7	162	4	80	45 72	45 72	45 72	15	3.0	74.6

ROAD SEGMENT #2: Baldwin Park Boulevard, south of Live Oak Avenue	TOTAL # VEHICLE PCE proof	TOTAL # VEHICLE PCE	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto k/h	MT k/h	HT k/h	Distance to Receptor (Meters)	Attenuation (3.0 or 4.5)	Calculated dBA
Existing (2013)	777	777	95	738	2	16	3	24	40 64	40 64	40 64	15	3.0	68.2
Project Trips	18	18	100	18	0	0	0	0	40 64	40 64	40 64	15	3.0	48.6
Existing+Project Trips	795	795	95	756	2	16	3	24	40 64	40 64	40 64	15	3.0	68.3
2016 No Project	852	852	95	809	2	17	3	26	40 64	40 64	40 64	15	3.0	68.6
2016 + Project	870	870	95	827	2	17	3	26	40 64	40 64	40 64	15	3.0	68.6
2035 No Project	887	887	95	842	2	18	3	27	40 64	40 64	40 64	15	3.0	68.8
2035 + Project	905	905	95	860	2	18	3	27	40 64	40 64	40 64	15	3.0	68.8

ROAD SEGMENT #3: Live Oak Avenue, west of Stewart Avenue	TOTAL # VEHICLE PCE proof	TOTAL # VEHICLE PCE	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto k/h	MT k/h	HT k/h	Distance to Receptor (Meters)	Attenuation (3.0 or 4.5)	Calculated dBA
Existing (2013)	2,941	2,941	93	2,735	2	59	5	147	40 64	40 64	40 64	15	3.0	75.1
Project Trips	46	46	53	24	40	18	7	3	40 64	40 64	40 64	15	3.0	60.4
Existing+Project Trips	2,987	2,987	92	2,760	3	77	5	150	40 64	40 64	40 64	15	3.0	75.3
2016 No Project	3,266	3,266	93	3,037	2	65	5	163	40 64	40 64	40 64	15	3.0	75.6
2016 + Project	3,312	3,312	92	3,062	3	84	5	167	40 64	40 64	40 64	15	3.0	75.7
2035 No Project	3,402	3,402	93	3,164	2	68	5	170	40 64	40 64	40 64	15	3.0	75.7
2035 + Project	3,448	3,448	92	3,188	3	86	5	173	40 64	40 64	40 64	15	3.0	75.9

ROAD SEGMENT #4: Arrow Highway, north of Live Oak Avenue	TOTAL # VEHICLE PCE proof	TOTAL # VEHICLE PCE	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto k/h	MT k/h	HT k/h	Distance to Receptor (Meters)	Attenuation (3.0 or 4.5)	Calculated dBA
Existing (2013)	867	867	94	815	2	17	4	35	45 72	45 72	45 72	15	3.0	70.2
Project Trips	49	49	95	47	5	2	0	0	45 72	45 72	45 72	15	3.0	55.5
Existing+Project Trips	916	916	94	862	2	20	4	35	45 72	45 72	45 72	15	3.0	70.3
2016 No Project	1,009	1,009	94	948	2	20	4	40	45 72	45 72	45 72	15	3.0	70.8
2016 + Project	1,058	1,058	94	995	2	23	4	40	45 72	45 72	45 72	15	3.0	70.9
2035 No Project	1,049	1,049	94	986	2	21	4	42	45 72	45 72	45 72	15	3.0	71.0
2035 + Project	1,098	1,098	94	1,033	2	23	4	42	45 72	45 72	45 72	15	3.0	71.1

Appendix J
California Communities Environmental Health Screening Tool

California Communities Environmental Health Screening Tool, Version 1.1 (CalEnviroScreen 1.1)

Guidance and Screening Tool



September 2013 Update

Matthew Rodriquez, Secretary
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PREFACE TO VERSION 1.1

CalEnviroscreen 1.1 is the latest iteration of the CalEnviroScreen tool. It uses the same methodology as Version 1.0 except that the indicator for race/ethnicity was removed from the calculation of a community's CalEnviroScreen score. This change was made to facilitate the use of the tool by government entities that may be restricted from considering race/ethnicity when making certain decisions. While race and ethnicity will not be used in compiling a score using CalEnviroScreen, a new section has been added that provides information on the racial and ethnic composition of communities throughout the state. This information will help us to better understand the correlation between race/ethnicity and the pollution burdens facing communities in California. Cal/EPA and OEHHA are committed to updating and expanding this section as new versions of the tool are released.

GUIDANCE FROM THE SECRETARY

During the past three years, one of our top priorities has been to integrate environmental justice principles throughout the California Environmental Protection Agency's (Cal/EPA's or Agency's) boards, departments and office. State law defines environmental justice to mean "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation and enforcement of environmental laws, regulations, and policies." This definition should not just be words or an illusory concept; rather, it must be a goal to strive for and achieve. Cal/EPA's mission is to restore, protect and enhance the environment, and to ensure public health, environmental quality and economic vitality. Environmental justice and investment in communities burdened by pollution are critical to accomplishing this mission.

Despite the best efforts of many segments of society, a large number of Californians live in the midst of multiple sources of pollution and some people and communities are more vulnerable to the effects of pollution than others. In order to respond to this situation, it is important to identify the areas of the state that face multiple pollution burdens so programs and funding can be targeted appropriately toward improving the environmental health and economic vitality of the most impacted communities. For this reason, the Agency and the Office of Environmental Health Hazard Assessment (OEHHA) have developed a science-based tool for evaluating multiple pollutants and stressors in communities, called the California Communities Environmental Health Screening Tool (CalEnviroScreen).

To ensure that CalEnviroScreen is properly understood and utilized, we are providing the following guidance to the Agency, its boards, departments, and office, as well as the public and stakeholders.

CalEnviroScreen should be used primarily to assist the Agency in carrying out its environmental justice mission: to conduct its activities in a manner that ensures the fair treatment of all Californians, including minority and low-income populations. The tool is the next step in the implementation of the Agency's 2004 Environmental Justice Action Plan, which called for the development of guidance to analyze the impacts of multiple pollution sources in California communities.

The tool shows which portions of the state have higher pollution burdens and vulnerabilities than other areas, and therefore are most in need of assistance. In a time of limited resources, it will provide meaningful insight into how decision makers can focus available time, resources, and programs to improve the environmental health of Californians, particularly those most burdened by pollution. The tool uses existing environmental, health, demographic and socioeconomic data to create a screening score for communities across the state. An area with a high score would be expected to experience much higher impacts than areas with low scores.

Cal/EPA and OEHHA are committed to revising the tool in the future, using an open and public process, as new information becomes available in order to make the tool as meaningful and as current as possible. Over the next several years, we plan to refine the tool by considering additional indicators, modifying the geographic scale, enhancing the current indicators, and reassessing the tool's methodology. In addition, we will look for new ways to ensure the tool is accessible and comprehensible to the public.

Background

Cal/EPA released the first draft of CalEnviroScreen for public review and comment in July 2012. This draft built upon a 2010 report[1] that described the underlying science and a general method for identifying communities that face multiple pollution burdens. It further developed and explained the methodology described in the 2010 report. After releasing the first draft, Cal/EPA and OEHHA conducted 12 public workshops in seven regions throughout the state. At these workshops, the methodology and our conclusions were discussed with the public and a wide range of stakeholders, including community, business, industry, academic and governmental groups. These regional workshops yielded over 1000 oral and written comments and questions. A subsequent draft was released in January 2013. Cal/EPA and OEHHA solicited additional comments and suggestions, and considered them in making additional changes to the tool.

Potential Uses

Potential uses of the tool by Cal/EPA and its boards, departments, and office include administering environmental justice grants, promoting greater compliance with environmental laws, prioritizing site-cleanup activities, and identifying opportunities for sustainable economic development in heavily impacted neighborhoods. Other entities and interested parties may identify additional uses for this tool and the information it provides.

Implementation of SB 535

CalEnviroScreen will inform Cal/EPA's identification of disadvantaged communities pursuant to Senate Bill 535 (De León, Chapter 830, Statutes of 2012). SB 535 requires Cal/EPA to identify disadvantaged communities based on geographic, socioeconomic, public health, and environmental hazard criteria. It also requires that the investment plan developed and submitted to the Legislature pursuant to Assembly Bill 1532 (John A. Pérez, Chapter 807, Statutes of 2012) allocate no less than 25 percent of available proceeds from the carbon auctions held under California's Global Warming Solutions Act of 2006 to projects that will benefit these disadvantaged communities. At least 10 percent of the available moneys from these auctions must be directly allocated in such communities. Since CalEnviroScreen has been developed to identify areas that are disproportionately affected by pollution and those areas whose populations are socioeconomically disadvantaged, it is well suited for the purposes described by SB 535.

Environmental Justice Activities

CalEnviroScreen will be useful in administering the Agency's Environmental Justice Small Grant Program, and may guide other grant programs as well as environmental education and community programs throughout the state. It will also help to inform Agency boards and departments when they are budgeting scarce resources for cleanup and abatement projects. Additionally, CalEnviroScreen will help to guide boards and departments when planning their community engagement and outreach efforts. Knowing which areas of the state have higher relative environmental burdens will not only help with efforts to increase compliance with environmental laws in disproportionately impacted areas, but also will provide Cal/EPA and its boards, departments, and office with additional insights on the potential implications of their activities and decisions.

Local and Regional Governments

Local and regional governments, including regional air districts, water districts, and planning and transit

[1] OEHHA and Cal/EPA (2012) *Cumulative Impacts: Building a Scientific Foundation*, Sacramento, CA. Available online at: http://www.oehha.ca.gov/ej/cipa123110.html

agencies, may also find uses for this tool. Cal/EPA will continue to work with local and regional governments to further explore the applicability of CalEnviroScreen for other uses. This includes the possibility of helping to identify and plan for opportunities for sustainable development in heavily impacted neighborhoods. These areas could also be targeted for cleaning up blight and promoting development in order to bring in jobs and increase economic stability. As an example, the tool could assist efforts to develop planning and financial incentives to retain jobs and create new, sustainable business enterprises in disproportionately impacted communities.

Of course, it will be important to work with organizations such as economic development corporations, workforce investment boards, local chambers of commerce, and others to develop strategies to help businesses thrive in the identified areas and to attract new businesses and services to those areas. CalEnviroScreen may also assist local districts and governments with meeting their obligations under certain state funding programs. Finally, it is important to remember that CalEnviroScreen provides a broad environmental snapshot of a given region. While the data gathered in developing the tool could be useful for decision makers when assessing existing pollution sources in an area, more precise data are often available to local governments and would be more relevant in conducting such an examination.

General Notes and Limitations

CalEnviroScreen was developed for Cal/EPA and its boards, departments, and office. Its publication does not create any new programs, regulatory requirements or legal obligations. There is no mandate express or implied that local governments or other entities must use the tool or its underlying data. Planning, zoning and development permits are matters of local control and local governments are free to decide whether the tool's output or the information contained in the tool provide an understanding of the environmental burdens and vulnerabilities in their localities.

While CalEnviroScreen will assist Cal/EPA and its boards, departments, and office in prioritizing resources and help promote greater compliance with environmental laws, it is important to note some of its limitations. The tool's output provides a relative ranking of communities based on a selected group of available datasets, through the use of a summary score. The CalEnviroScreen score is not an expression of health risk, and does not provide quantitative information on increases in cumulative impacts for specific sites or projects. Further, as a comparative screening tool, the results do not provide a basis for determining when differences between scores are significant in relation to public health or the environment. Accordingly, the tool is not intended to be used as a health or ecological risk assessment for a specific area or site.

Additionally, the CalEnviroScreen scoring results are not directly applicable to the cumulative impacts analysis required under the California Environmental Quality Act (CEQA). The statutory definition of "cumulative impacts" contained in CEQA is substantially different than the working definition of "cumulative impacts" used to guide the development of this tool. Therefore, the information provided by this tool cannot be used as a substitute for an analysis of the cumulative impacts of any specific project for which an environmental review is required by CEQA.

Moreover, CalEnviroScreen assesses environmental factors and effects on a regional or community-wide basis and cannot be used in lieu of performing an analysis of the potentially significant impacts of any specific project. Accordingly, a lead agency must determine independently whether a proposed project's impacts may be significant under CEQA based on the evidence before it, using its own discretion and judgment. The tool's results are not a substitute for this required analysis. Also, this tool considers some social, health, and economic

factors that may not be relevant when doing an analysis under CEQA. Finally, as mentioned above, the tool's output should not be used as a focused risk assessment of a given community or site. It cannot predict or quantify specific health risks or effects associated with cumulative exposures identified for a given community or individual.

Conclusion

We are proud of the collaborative work of OEHHA and the input of the departments and boards in Cal/EPA as well as the level of public participation and level of input we received in the development of CalEnviroScreen. This project represents the largest public screening tool effort in the nation – both in geographic scope and level of detail. It is an achievement that could not have been realized had it not been for the tireless efforts of OEHHA and the invaluable input of all of our stakeholders. The development of CalEnviroScreen involved many residents, community-based organizations, nongovernmental organizations, local officials, state agencies and representatives from business, industry and academia. The release of the CalEnviroScreen was just the first step. If CalEnviroScreen is to succeed, that cooperative effort must continue. I welcome your active participation as we move forward with future versions of CalEnviroScreen and work to advance environmental justice and economic vitality.



Matthew Rodriquez
Secretary for Environmental Protection

April 2013
Updated September 2013

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INTRODUCTION

Californians are burdened by environmental problems and sources of pollution in ways that vary across the state. Some Californians are more vulnerable to the effects of pollution than others. This document describes a science-based method for evaluating multiple pollution sources in a community while accounting for a community's vulnerability to pollution's adverse effects. Factors that contribute to a community's pollution burden or vulnerability are often referred to as stressors. The CalEnviroScreen tool can be used to identify California's most burdened and vulnerable communities. This can help inform decisions at the California Environmental Protection Agency's (Cal/EPA) boards and departments by identifying places most in need of assistance.

Statewide Evaluation

Using CalEnviroScreen, a statewide analysis has been conducted that identifies communities in California most burdened by pollution from multiple sources and most vulnerable to its effects, taking into account their socioeconomic characteristics and underlying health status. In doing so, CalEnviroScreen

- Produces a *relative*, rather than absolute, measure of impact.
- Provides a baseline assessment and methodology that can be expanded upon and updated periodically as important additional information becomes available.
- Demonstrates a practical and scientific methodology for evaluating multiple pollution sources and stressors that takes into account a community's vulnerability to pollution.

Community impact assessment from multiple sources and stressors is complex and difficult to approach with traditional risk assessment practices. Chemical-by-chemical, source-by-source, route-by-route risk assessment approaches are not well suited to the assessment of community-scale impacts, especially for identifying the most impacted places across all of California. Although traditional risk assessment may account for the heightened sensitivities of some groups, such as children and the elderly, it has not considered other community characteristics that have been shown to affect vulnerability to pollution, such as socioeconomic factors or underlying health status.

Given the limits of traditional risk assessment, the Office of Environmental Health Hazard Assessment (OEHHA) and Cal/EPA developed a workable approach to conduct a statewide evaluation of community impacts. It built upon the general method and a description of the underlying science published in Cal/EPA's and OEHHA's 2010 report, *Cumulative Impacts: Building A Scientific Foundation*. The method emerges from basic risk assessment concepts and is sufficiently expansive to incorporate multiple factors that reflect community impacts that have not been included in traditional risk assessments. The tool presents a broad picture of the burdens and vulnerabilities different areas confront from environmental pollutants.

Stakeholder Involvement

Transparency and public input into government decision making and policy development are the cornerstones of environmental justice. In that spirit, the framework for the CalEnviroScreen was developed with the assistance of the Cumulative Impacts and Precautionary Approaches (CIPA) Work Group, consisting of representatives of business and non-governmental organizations, academia and government. The CIPA Work Group also reviewed draft versions of this report and provided critical feedback and input that guided the development of this tool. We appreciate the considerable time and effort that the Work Group has devoted to this project since 2008. We also appreciate the input from the general public we heard during the Work Group meetings.

Cal/EPA also received input on a previous draft of this document at a series of regional and stakeholder-specific public workshops and an academic workshop.[2] Input from California communities, businesses, local governments, California tribes, community-based organizations, and other stakeholders as well as academia was critical in the development of this project and is reflected in changes made to the final document.

Work in this field continues and presents opportunities to refine the tool. Thus, over the next several years we plan to release new versions of the tool that include improvements to the indicators used, the geographic scale, the methodology employed and the accessibility of the tool to the public. Cal/EPA remains committed to an open and public process in developing future versions of the tool.

This report describes CalEnviroScreen's methodological approach, which relies on the use of indicators to measure factors that affect pollution impacts in communities. The report describes the indicators and the criteria used to select them as well as the geographic scale used to define communities. Data representing the indicators for the different areas of the state were obtained and analyzed and are presented here as statewide maps.[3] All the indicators for a locale are combined to generate a score for the community. The report concludes by providing general results for the statewide evaluation, presented as maps showing the top 5 and10 percent of the most impacted communities in California.

[2] Additional information on these workshops as well as the CIPA Work Group meetings and the development of the tool are available at www.oehha.ca.gov/ej/index.html.

[3] The community scores for individual indicators are available online at http://www.oehha.ca.gov/ej/index.html.

What is New in CalEnviroScreen 1.1?

Since CalEnviroScreen was originally released in April 2013, interest has emerged in using the screening tool for a number of applications outside of Cal/EPA, including for grant funding allocation decisions. In light of concerns over whether CalEnviroScreen's inclusion of a race/ethnicity indicator may place legal barriers to certain uses of the tool by government agencies, Cal/EPA has determined that removing it would best support these additional applications. Version 1.1 incorporates this change.

While the CalEnviroScreen 1.1 score no longer includes a race/ethnicity indicator, the report retains other key socioeconomic indicators, such as poverty, linguistic isolation, and educational attainment. Additionally, the CalEnviroScreen 1.1 report adds a new section that evaluates the relationship between CalEnviroScreen scores and race/ethnicity. These results reveal the disproportionate pollution burden and population vulnerability facing non-white communities.

METHOD

Definition of Cumulative Impacts

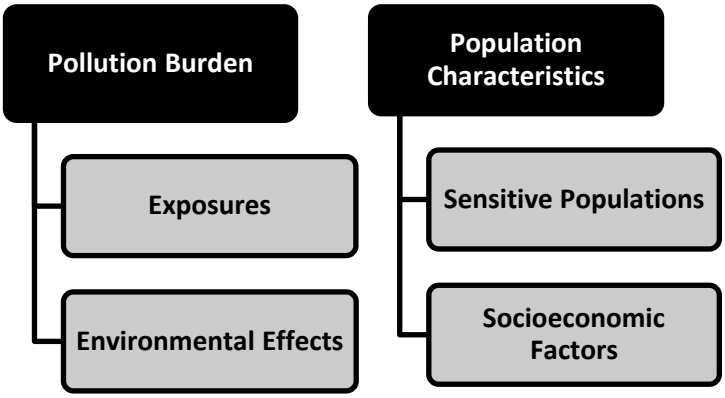
Cal/EPA adopted the following working definition of cumulative impacts[4] in 2005:

> *"Cumulative impacts means exposures, public health or environmental effects from the combined emissions and discharges, in a geographic area, including environmental pollution from all sources, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts will take into account sensitive populations and socioeconomic factors, where applicable and to the extent data are available."*

CalEnviroScreen Model

The CalEnviroScreen model is based on the Cal/EPA working definition in that:

- The model is place-based and provides information for the entire State of California on a geographic basis. The geographic scale selected is intended to be useful for a wide range of decisions.
- The model is made up of multiple components cited in the above definition as contributors to cumulative impacts. The model includes two components representing pollution burden – exposures and environmental effects – and two components representing population characteristics – sensitive populations (e.g., in terms of health status and age) and socioeconomic factors.



[4] This definition differs from the statutory definition of "cumulative impacts" contained in the California Environmental Quality Act (CEQA). While the term is the same, they cannot be used interchangeably. For a detailed discussion of this issue, please see the Guidance from the Secretary.

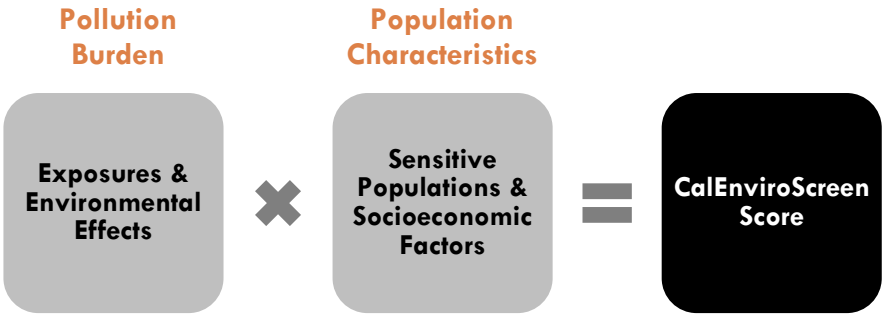
Model Characteristics

The model:

- Uses a suite of statewide indicators to characterize both pollution burden and population characteristics.
- Uses a limited set of indicators in order to keep the model simple.
- Assigns scores for each of the indicators in a given geographic area.
- Uses a scoring system to weight and sum each set of indicators within pollution burden and population characteristics components.
- Derives a CalEnviroScreen score for a given place relative to other places in the state, using the formula below.

Formula for Calculating CalEnviroScreen Score

After the components are scored, the scores are combined as follows to calculate the overall CalEnviroScreen Score:



Rationale for Formula

The mathematical formula for calculating scores uses multiplication. Scores for the pollution burden and population characteristics categories are multiplied together (rather than added, for example). Although this approach may be less intuitive than simple addition, there is scientific support for this approach to scoring.

Multiplication was selected for the following reasons:

1. *Scientific Literature*: Existing research on environmental pollutants and health risk has consistently identified socioeconomic and sensitivity factors as "effect modifiers." For example, numerous studies on the health effects of particulate air pollution have found that low socioeconomic status is associated with about a 3-fold increased risk of morbidity or mortality for a given level of particulate pollution (Samet and White, 2004). Similarly, a study of asthmatics found that their sensitivity to an air pollutant was up to 7-fold greater than non-asthmatics (Horstman *et al.*, 1986). Low-socioeconomic status African-American mothers exposed to traffic-related air pollution were twice as likely to deliver preterm babies (Ponce *et al.*, 2005). The young can be 10 times more sensitive to environmental carcinogen exposures than adults (OEHHA, 2009). Studies of increased

risk in vulnerable populations can often be described by effect modifiers that amplify the risk. This research suggests that the use of multiplication makes sense based on the existing scientific literature.

2. *Risk Assessment Principles*: Some members of the general population (such as children) may be 10 times more sensitive to some chemical exposures than others. Risk assessments, using principles first advanced by the National Academy of Sciences, apply numerical factors or multipliers to account for potential human sensitivity (as well as other factors such as data gaps) in deriving acceptable exposure levels (US EPA, 2012).
3. *Established Risk Scoring Systems*: Priority-rankings done by various emergency response organizations to score threats have used scoring systems with the formula: Risk = Threat × Vulnerability (Brody *et al.*, 2012). These formulas are widely used and accepted.

Maximum Scores for Combined Components

Component Group	Maximum Score*
Pollution Burden	
Exposures and Environmental Effects	10
Population Characteristics	
Sensitive Populations and Socioeconomic Factors	10
CalEnviroScreen Score	**Up to 100 (= 10 × 10)**

* The scores for each group were rounded to one decimal place before multiplying to calculate the CalEnviroScreen Score (for example, 6.5 out of a possible 10)

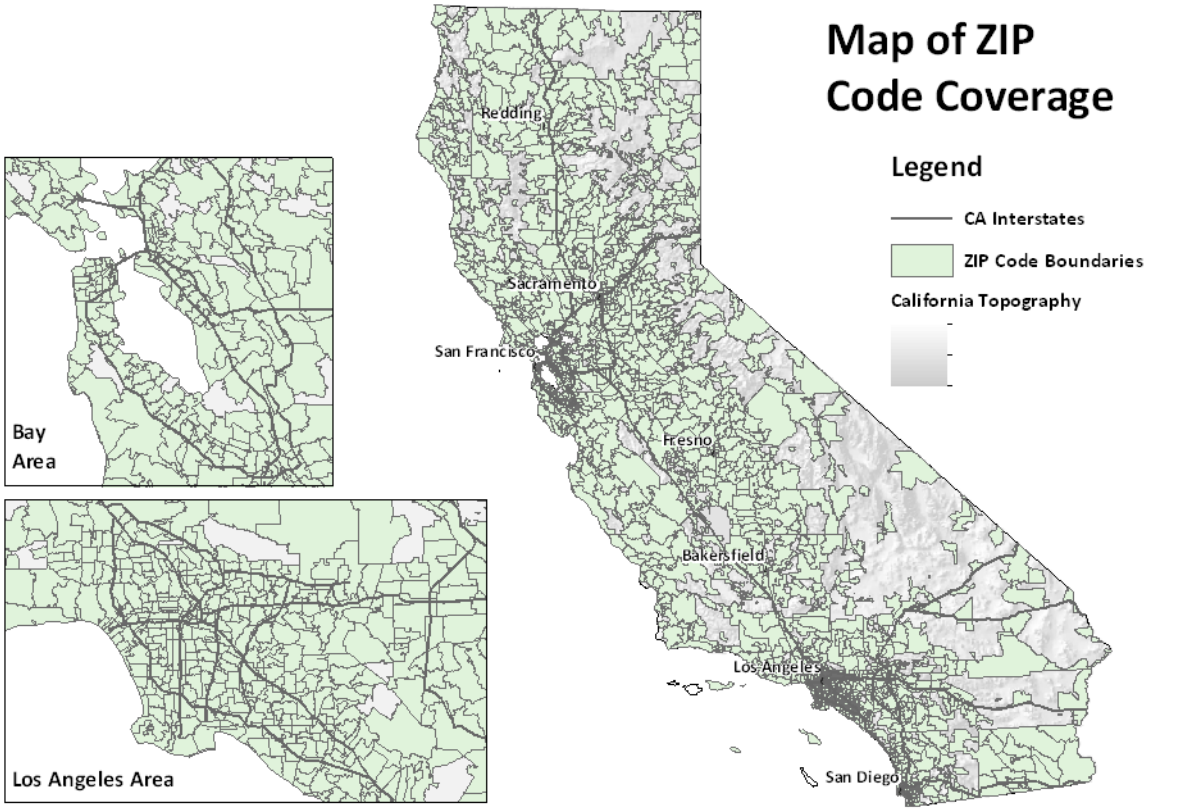
Notes on Scoring System

In the CalEnviroScreen scoring model, the Population Characteristics are considered to be a modifier of the Pollution Burden. In mathematical terms, the Pollution Burden is the multiplicand and Population Characteristics is the multiplier, with the CalEnviroScreen Score as the product. Because the final CalEnviroScreen score represents the product of two numbers, the final ordering of the communities is independent of the magnitude of the scale chosen for each (without rounding scores). That is, the communities would be ordered the same in their final score if the Population Characteristics were scaled to 3, 5, or 10, for example. Here, a scale up to 10 was chosen for convenience.

Selection of Geographic Scale

For this version of CalEnviroScreen, the ZIP code scale is the unit of analysis. A representation of ZIP codes, called ZCTAs (ZIP Code Tabulation Areas), is available from the Census Bureau. These were updated in 2010.[5] For simplicity, these areas are referred to as ZIP codes throughout this report.

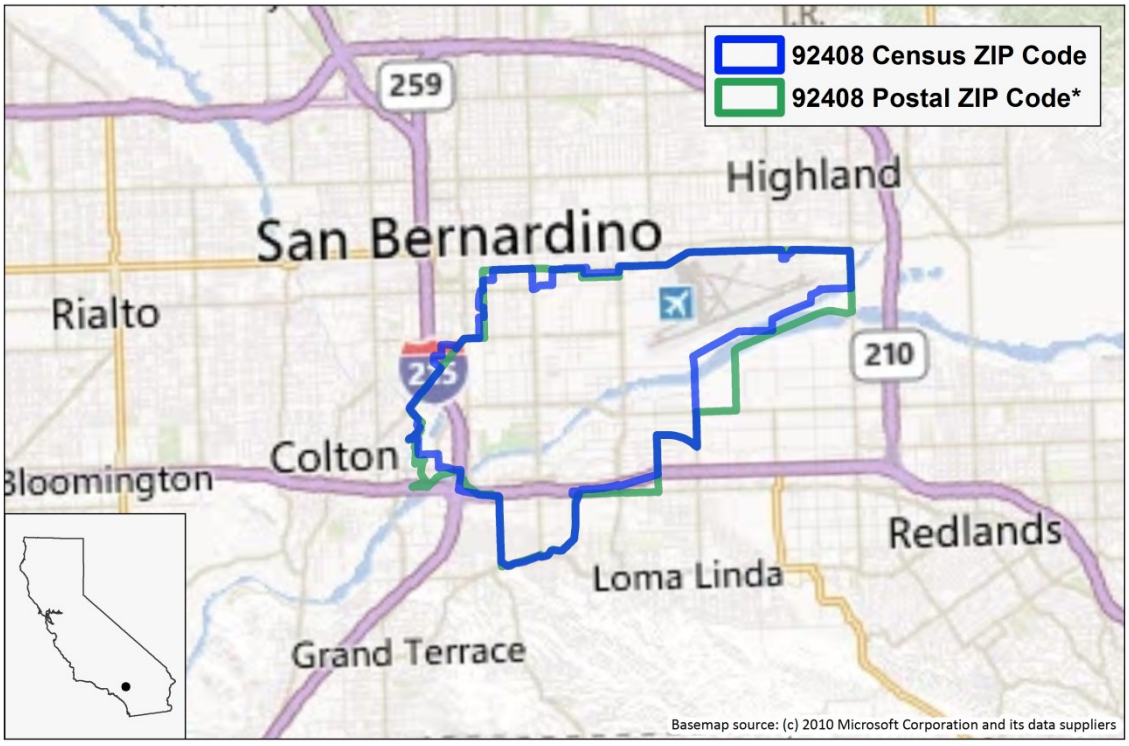
The census ZIP codes cover areas where people live, but do not include many sparsely populated places, like national parks. There are approximately 1,800 census ZIP codes in California, representing a relatively fine scale of analysis.[6]



[5] Additional information on the U.S. Census Bureau's ZIP Code Tabulation Areas may be found on their website: http://www.census.gov/geo/ZCTA/zcta.html.

[6] In a future version of the tool, results will also be available at the census tract scale.

The following map shows the relationship between census-derived ZIP codes (ZCTAs) and approximate postal service ZIP codes for an area in San Bernardino. For many ZIP codes they are similar.



* Postal service ZIP code approximations were obtained from Esri, Inc.

Analysis of CalEnviroScreen 1.1 Scores and Race/Ethnicity

The relationship between the calculated CalEnviroScreen score and race/ethnicity was examined. After sorting all the ZIP codes by CalEnviroScreen score, ZIP codes were placed in 10 groups (deciles), highest to lowest. The racial/ethnic composition of each decile was examined by using data from the U.S. Census Bureau.

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INDICATOR SELECTION AND SCORING

The overall CalEnviroScreen community scores are driven by indicators. Here are the steps in the process for selecting indicators and using them to produce scores.

Overview of the Process

1. Identify potential indicators for each component.
2. Find sources of data to support indicator development (see Criteria for Indicator Selection below).
3. Select and develop indicator, assigning a value for each geographic unit.
4. Assign a percentile for each indicator for each geographic unit, based on the rank-order of the value.
5. Generate maps to visualize data.
6. Derive scores for pollution burden and population characteristics components (see Indicator and Component Scoring below).
7. Derive the overall CalEnviroScreen score by combining the component scores (see below).
8. Generate maps to visualize overall results.

The selection of specific indicators requires consideration of both the type of information that will best represent statewide pollution burden and population characteristics, and the availability and quality of such information at the necessary geographic scale statewide.

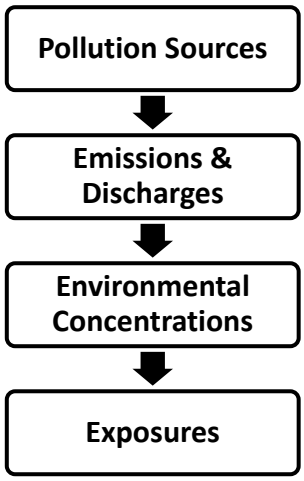
Criteria for Indicator Selection

- An indicator should provide a measure that is relevant to the component it represents, in the context of the 2005 Cal/EPA cumulative impacts definition.
- Indicators should represent widespread concerns related to pollution in California.
- The indicators taken together should provide a good representation of each component.
- Pollution burden indicators should relate to issues that may be potentially actionable by Cal/EPA boards and departments.
- Population characteristics indicators should represent demographic factors known to influence vulnerability to disease.
- Data for the indicator should be available for the entire state at the ZIP code level geographical unit or translatable to the ZIP code level.
- Data should be of sufficient quality, and be:
  - Complete
  - Accurate
  - Current

Exposure Indicators

People may be exposed to a pollutant if they come in direct contact with it, by breathing contaminated air, for example.

No data are available statewide that provide direct information on exposures. Exposures generally involve movement of chemicals from a source through the environment (air, water, food, soil) to an individual or population. For purposes of the CalEnviroScreen, data relating to pollution sources, releases, and environmental concentrations are used as indicators of potential human exposures to pollutants. Six indicators were identified and found consistent with criteria for exposure indicator development. They are:



- Ozone concentrations in air
- PM2.5 concentrations in air
- Diesel particulate matter emissions
- Use of certain high-hazard, high-volatility pesticides
- Toxic releases from facilities
- Traffic density

Environmental Effect Indicators

Environmental effects are adverse environmental conditions caused by pollutants.

Environmental effects include various aspects of environmental degradation, ecological effects and threats to the environment and communities. The introduction of physical, biological and chemical pollutants into the environment can have harmful effects on different components of the ecosystem. Effects can be immediate or delayed. In addition to direct effects on ecosystem health, the environmental effects of pollution can also affect people by limiting the ability of communities to make use of ecosystem resources (e.g., eating fish or swimming in local rivers or bays). Also, living in an environmentally degraded community can lead to stress, which may affect human health. In addition, the mere presence of a contaminated site or high-profile facility can have tangible impacts on a community, even if actual environmental degradation cannot be documented. Such sites or facilities can contribute to perceptions of a community being undesirable or even unsafe.

Statewide data on the following topics were identified and found consistent with criteria for indicator development:

- Toxic cleanup sites
- Groundwater threats from leaking underground storage sites and

cleanups
- Hazardous waste facilities and generators
- Impaired water bodies
- Solid waste sites and facilities

Sensitive Population Indicators

Sensitive populations are populations with biological traits that result in increased vulnerability to pollutants.

Sensitive individuals may include those undergoing rapid physiological change, such as children, pregnant women and their fetuses, and individuals with impaired physiological conditions, such as the elderly or people with existing diseases such as heart disease or asthma. Other sensitive individuals include those with lower protective biological mechanisms due to genetic factors.

Pollutant exposure is a likely contributor to many observed adverse outcomes at the population level, and has been demonstrated for some outcomes such as asthma, low birth weight, and heart disease. People with these health conditions are also more susceptible to health impacts from pollution. With few exceptions, adverse health conditions are difficult to attribute solely to exposure to pollutants. High quality statewide data related to these and other health conditions that can be influenced by toxic chemical exposures were identified and found consistent with criteria for development of these indicators:

- Prevalence of children and elderly
- Asthma
- Low birth-weight infants

Socioeconomic Factor Indicators

Socioeconomic factors are community characteristics that result in increased vulnerability to pollutants.

A growing body of literature provides evidence of the heightened vulnerability of people of color and lower socioeconomic status to environmental pollutants. For example, a study found that individuals with less than a high school education who were exposed to particulate pollution had a greater risk of mortality. Here, socioeconomic factors that have been associated with increased population vulnerability were selected.

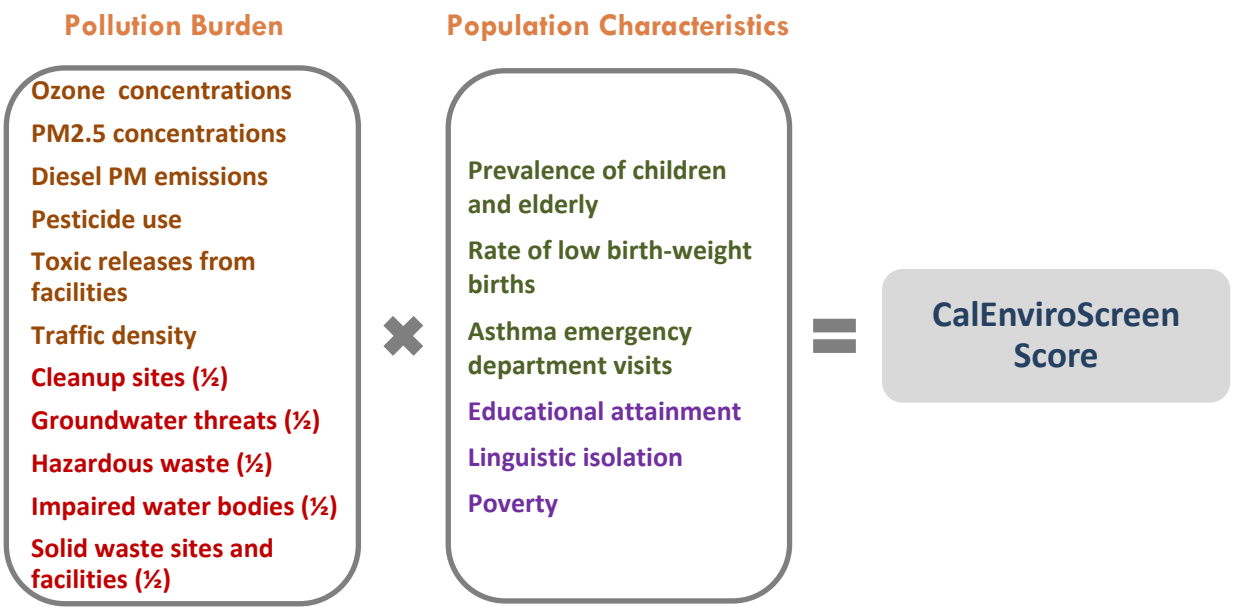
Data on the following socioeconomic factors were identified and found consistent with criteria for indicator development:

- Educational attainment
- Linguistic isolation
- Poverty

Indicator and Component Scoring

- The indicator values for the entire state are ordered from highest to lowest. A percentile is calculated from the ordered values for all areas that have a score.* Thus each area's percentile rank for a specific indicator is relative to the ranks for that indicator in the rest of the places in the state.
  - The indicators used in this analysis have varying underlying distributions, and percentile rank calculations provide a useful way to describe data without making any potentially unwarranted assumptions about those distributions.
  - A geographic area's percentile for a given indicator simply tells the percentage of areas with lower values of that indicator.
  - A percentile cannot describe the magnitude of the difference between two or more areas. For example, an area ranked in the 30th percentile is not necessarily three times more impacted than an area ranked in the 10th percentile.
- Indicators from Exposures and Environmental Effects components were grouped together to represent Pollution Burden. Indicators from Sensitive Populations and Socioeconomic Factors were grouped together to represent Population Characteristics (see figure below).
- Scores for the Pollution Burden and Population Characteristics groups of indicators are calculated as follows:
  - First, the percentiles for all the individual indicators in a group are averaged. Each indicator from the Environmental Effects component was weighted half as much as those indicators from the Exposures component. This was done because the contribution to possible pollutant burden from the Environmental Effects indicators was considered to be less than those from sources in the Exposures indicators. Thus the score for the Pollution Burden category is a weighted average, with Exposure indicators receiving twice the weight as Environmental Effects indicators.
  - Second, Pollution Burden and Population Characteristics group percentile averages are assigned scores from their defined ranges (up to 10) by dividing by 10 and rounding to one decimal place (e.g., 5.4).

* When a geographic area has no indicator value (for example, the area has no facilities with toxic releases present), it is excluded from the percentile calculation and assigned a score of zero for that indicator. When data are unavailable or missing for a geographic area (for example, the area is greater than 50 kilometers from an air monitor), it is excluded from the percentile calculation and is not assigned any score for that indicator. Thus the percentile score can be thought of as a comparison of one geographic area to other localities in the state where the hazard effect or population characteristic is present.



CalEnviroScreen Score and Maps

- The overall CalEnviroScreen score is calculated from the Pollution Burden and Population Characteristics groups of indicators by multiplying the two scores. Since each group has a maximum score of 10, the maximum CalEnviroScreen Score is 100.
- The geographic areas are ordered from highest to lowest, based on their overall score. A percentile for the overall score is then calculated from the ordered values. As with the percentiles for individual indicators, a geographic area's overall CalEnviroScreen percentile equals the percentage of all ordered CalEnviroScreen scores that fall below the score for that area.
- Maps are developed showing the percentiles for all the ZIP codes of the state. Maps are also developed highlighting the ZIP codes scoring the highest.

Uncertainty and Error

There are different types of uncertainty that are likely to be introduced in the development of any screening method for evaluating pollution burden and population vulnerability in different geographic areas. Several important ones are:

- The degree to which the data that are included in the model are correct.
- The degree to which the data and the indicator metric selected reflect meaningful contributions in the context of identifying areas that are impacted by multiple sources of pollution and may be especially vulnerable to their effects.
- The degree to which data gaps or omissions influence the results.

Efforts were made to select datasets for inclusion that are complete, accurate and current. Nonetheless, there are uncertainties that may arise because environmental conditions change over time, large databases may contain errors, or there are possible biases in how complete the

data sets are across the state, among others. Some of these uncertainties were addressed in the development of indicators. For example:

- Clearly erroneous place-based information for facilities or sites has been removed.
- Low incidences or small counts (e.g., health outcomes) have been excluded from the analysis.
- Highly uncertain measurements (for example, >50 kilometers from an air monitor) have been excluded from the analysis.

Other types of uncertainty, such as those related to how well indicators measure what they are intended to represent in the model, are more difficult to measure quantitatively. For example:

- How well data on chemical uses or emission data reflect potential contact with pollution.
- How well vulnerability of a community is characterized by demographic data.

Generally speaking, indicators are surrogates for the characteristic being modeled, so a certain amount of uncertainty is inevitable. That said, this model comprised of a suite of indicators is considered useful in identifying places burdened by multiple sources of pollution with populations that may be especially vulnerable. Places that score highly for many of the indicators are likely to be identified as impacted. Since there are tradeoffs in combining different sources of information, the results are considered most useful for identifying communities that score highly using the model. Using a limited data set, an analysis of the sensitivity of the model to changes in weighting showed it is relatively robust in identifying more impacted areas (Meehan August *et al.*, 2012). Use of broad groups of areas, such as those scoring in the highest 5 and 10 percent, is expected to be the most suitable application of the CalEnviroScreen results.

Reference

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INDIVIDUAL INDICATORS: DESCRIPTION AND ANALYSIS

AIR QUALITY: OZONE

Exposure Indicator

Ozone pollution causes numerous adverse health effects, including respiratory irritation and lung disease. The health impacts of ozone and other criteria air pollutants (particulate matter (PM), nitrogen dioxide, carbon monoxide, sulfur dioxide, and lead) have been considered in the development of health-based standards. Of the six criteria air pollutants, ozone and particle pollution pose the most widespread and significant health threats. The California Air Resources Board maintains a wide network of air monitoring stations that provides information that may be used to better understand exposures to ozone and other pollutants across the state.

Indicator

Portion of the daily maximum 8-hour ozone concentration over the federal 8-hour standard (0.075 ppm), averaged over three years (2007 to 2009).

Data Source

Air Monitoring Network,
California Air Resources Board (CARB)

CARB, local air pollution control districts, tribes and federal land managers maintain a wide network of air monitoring stations in California. These stations record a variety of different measurements including concentrations of the six criteria air pollutants and meteorological data. In certain parts of the state, the density of the stations can provide high-resolution data for cities or localized areas around the monitors. However, not all cities have stations.

The information gathered from each air monitoring station audited by the CARB includes maps, geographic coordinates, photos, pollutant concentrations, and surveys.

http://www.arb.ca.gov/aqmis2/aqmis2.php
http://www.epa.gov/airquality/ozonepollution/
http://www.niehs.nih.gov/health/topics/agents/ozone/

Rationale

Ozone is an extremely reactive form of oxygen. In the upper atmosphere ozone provides protection against the sun's ultraviolet rays. Ozone at ground level is the primary component of smog. Ground-level ozone is formed from the reaction of oxygen-containing compounds with other air pollutants in the presence of sunlight. Ozone levels are typically at their highest in the afternoon and on hot days (NRC, 2008).

Adverse effects of ozone, including lung irritation, inflammation and exacerbation of existing chronic conditions, can be seen at even low exposures (Alexis *et al.* 2010, Fann *et al.* 2012, Zanobetti and Schwartz 2011). A long-term study in southern California found that rates of asthma hospitalization for children increased during warm season episodes of high ozone concentration (Moore *et al.* 2008). Additional studies have shown that the increased risk is higher among children under 2 years of age, young males, and African American children (Lin *et al.*, 2008, Burnett *et al.*, 2001). Increases in ambient ozone have also been

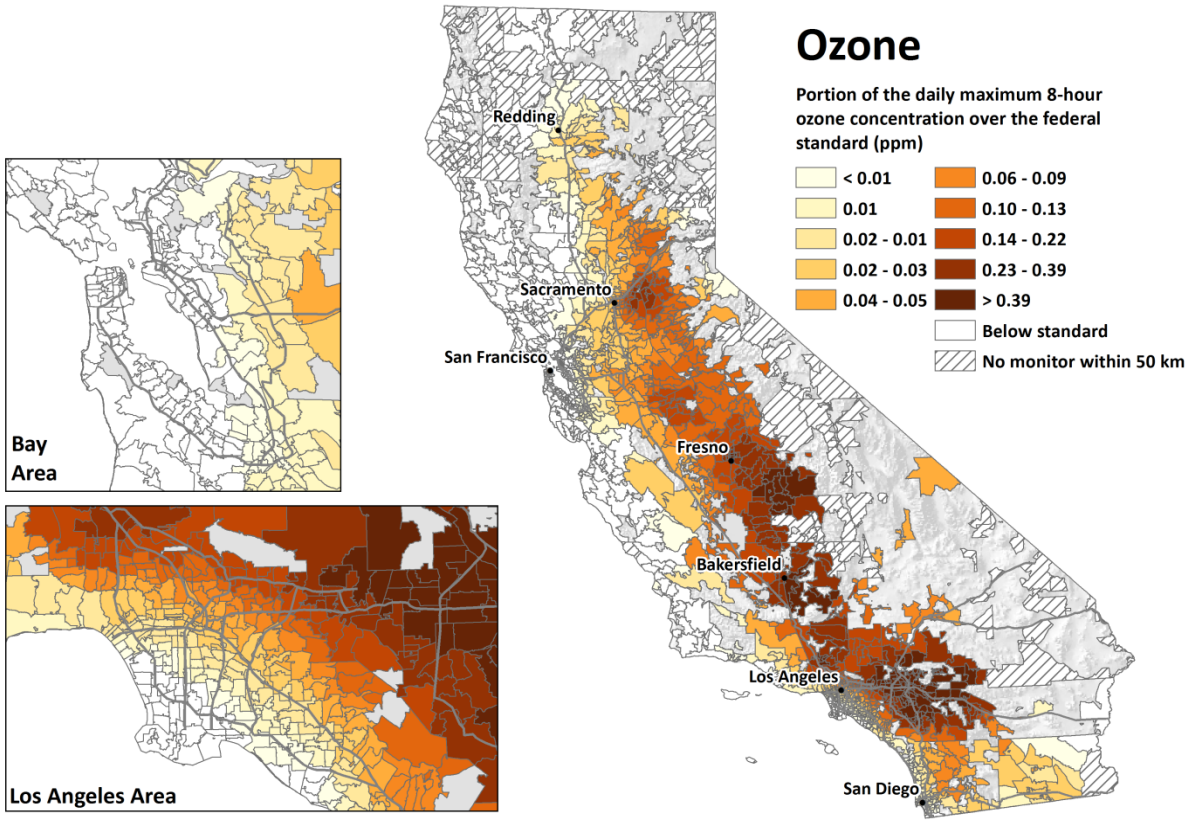
associated with higher mortality, particularly in the elderly, women and African Americans (Medina-Ramon, 2008). Some of the relationships between CalEnviroScreen scores and race are explored in the final section of the report. Together with PM2.5, ozone is a major contributor to air pollution-related morbidity and mortality (Fann *et al.* 2012).

Method

- Daily maximum 8-hour average concentrations for all monitoring sites in California were extracted from CARB's air monitoring network database for the years 2007-2009.
- The federal 8-hour standard (0.075 ppm) is subtracted from the monitoring data to arrive at the portion of the 8-hour concentration above the federal standard. Only concentrations over the federal standard from 2007-2009 were used.
- For each day in the 2007-2009 time period, the 8-hour ozone concentrations over the standard were estimated at the geographic center of the ZIP code using a geostatistical method that incorporates the monitoring data from nearby monitors (ordinary kriging).
- The estimated daily concentrations over the standard were averaged to obtain a single value for each ZIP code.
- ZIP codes were ordered by ozone concentration values and assigned a percentile based on the statewide distribution of values.

Indicator Map

Note: Values at ZIP codes with centers more than 50km from the nearest monitor were not estimated (signified by cross-hatching in the map below).



References

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Zanobetti A, Schwartz J (2011). Ozone and survival in four cohorts with potentially predisposing diseases. *Am J Respir Crit Care Med* **184**(7):836-41.

AIR QUALITY: PM2.5

Exposure Indicator

Particulate matter pollution, and fine particle (PM2.5) pollution in particular, has been shown to cause numerous adverse health effects, including heart and lung disease. PM2.5 contributes to substantial mortality across California. The health impacts of PM2.5 and other criteria air pollutants (ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, and lead) have been considered in the development of health-based standards. Of the six criteria air pollutants, particle pollution and ozone pose the most widespread and significant health threats. The California Air Resources Board maintains a wide network of air monitoring stations that provides information that may be used to better understand exposures to PM2.5 and other pollutants across the state.

Indicator

Annual mean concentration of PM2.5 (average of quarterly means), over three years (2007-2009).

Data Source

Air Monitoring Network,
California Air Resources Board (CARB)

CARB, local air pollution control districts, tribes and federal land managers maintain a wide network of air monitoring stations in California. These stations record a variety of different measurements including concentrations of the six criteria air pollutants and meteorological data. The density of the stations is such that specific cities or localized areas around monitors may have high resolution. However, not all cities have stations.

The site information gathered from each air monitoring station audited by CARB includes maps, locations coordinates, photos, pollutant concentrations, and surveys.

http://www.arb.ca.gov/aqmis2/aqmis2.php
http://www.epa.gov/airquality/particlepollution/

Rationale

Particulate matter (PM) is a complex mixture of aerosolized solid and liquid particles including such substances as organic chemicals, dust, allergens and metals. These particles can come from many sources, including cars and trucks, industrial processes, wood burning, or other activities involving combustion. The composition of PM depends on the local and regional sources, time of year, location and weather. The behavior of particles and the potential for PM to cause adverse health effects is directly related to particle size. The smaller the particle size, the more deeply the particles can penetrate into the lungs. Some fine particles have also been shown to enter the bloodstream. Those most susceptible to the effects of PM exposure include children, the elderly, and persons suffering from cardiopulmonary disease, asthma, and chronic illness (US EPA, 2012a).

PM2.5 refers to particles that have a diameter of 2.5 micrometers or less. Particles in this size range can have adverse effects on the heart

and lungs, including lung irritation, exacerbation of existing respiratory disease, and cardiovascular effects. The US EPA has set a new standard for ambient PM2.5 concentration of 12 µg/m^3, down from 15 µg/m^3. According to EPA's projections, by the year 2020 only 7 counties nationwide will have PM2.5 concentrations that exceed this standard. All are in California (US EPA, 2012b).

In children, researchers associated high ambient levels of PM2.5 in Southern California with adverse effects on lung development (Gauderman *et al.,* 2004). Another study in California found an association between components of PM2.5 and increased hospitalizations for several childhood respiratory diseases (Ostro *et al.,* 2009). In adults, studies have demonstrated relationships between daily mortality and PM2.5 (Ostro *et al.* 2006), increased hospital admissions for respiratory and cardiovascular diseases (Dominici *et al.* 2006), premature death after long-term exposure, and decreased lung function and pulmonary inflammation due to short term exposures (Pope, 2009). Exposure to PM during pregnancy has also been associated with low birth weight and premature birth (Bell *et al.* 2007; Morello-Frosch *et al.,* 2010).

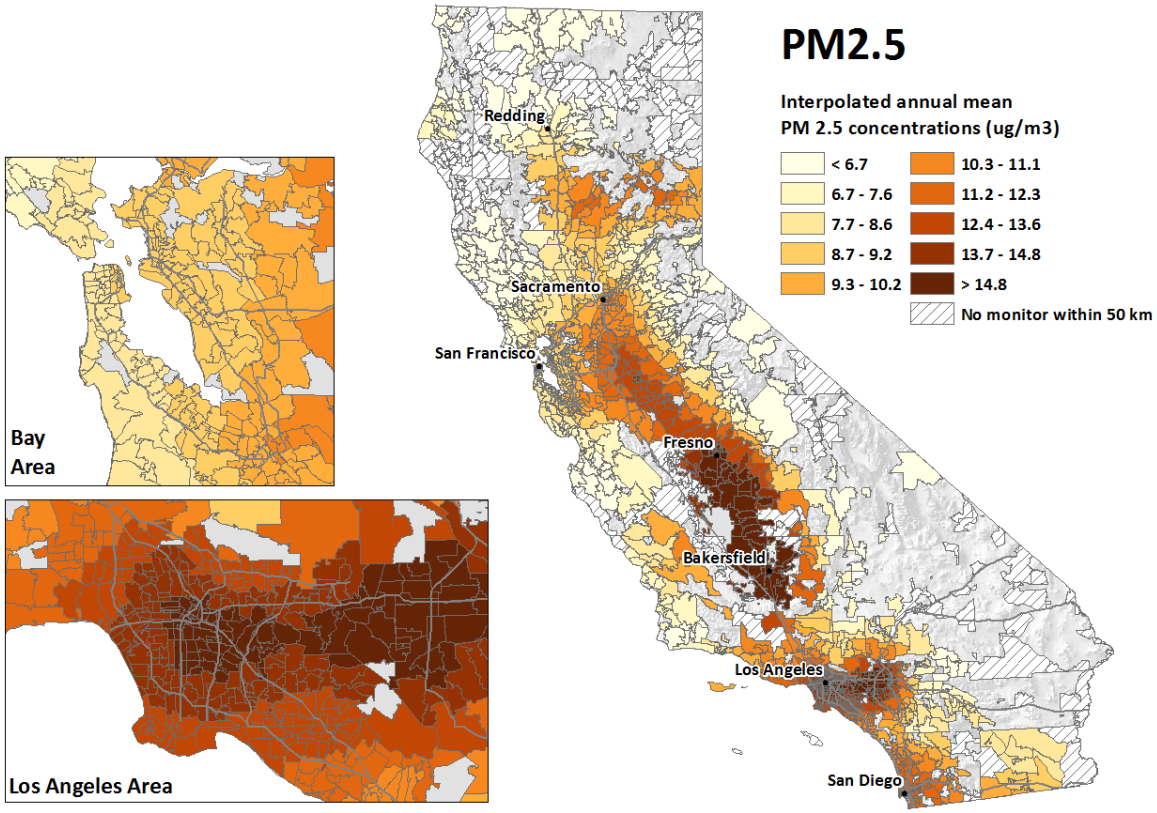
An additional source of PM2.5 in California is wildfires. Fires are not uncommon during dry seasons, particularly in Southern California and the Central Valley. Smoke particles fall almost entirely within the size range of PM2.5. Although the long term risks from exposure to smoke during a wildfire are relatively low, sensitive populations are more likely to experience severe symptoms, both acute and chronic (Lipsett *et al.* 2008). During the wildfires that spread throughout the state in June 2008, PM2.5 concentrations at a site in the northeast San Joaquin Valley were far above air quality standards and approximately ten times more toxic than normal ambient PM (Wegesser *et al.* 2009).

Method

- PM2.5 annual mean monitoring data for was extracted all monitoring sites in California from CARB's air monitoring network database for the years 2007-2009.
- Monitors that reported fewer than 75% of the expected number of observations, based on scheduled sampling frequency, were dropped from the analysis.
- For all measurements in the time period, the quarterly mean concentrations were estimated at the geographic center of the ZIP code using a geostatistical method that incorporates the monitoring data from nearby monitors (ordinary kriging).
- Annual means were then computed for each year by averaging the quarterly estimates and then averaging those over the three year period.
- ZIP codes were ordered by the PM2.5 concentration values and assigned a percentile based on the statewide distribution of values.

Indicator Map

Note: Values at ZIP codes with centers more than 50km from the nearest monitor were not estimated (signified by cross-hatching in the map below).



References

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Dominici F, Peng RD, Bell ML, Pham L, McDermott A, Zeger SL, *et al.* (2006). Fine particulate air pollution and hospital admission for cardiovascular and respiratory diseases. *JAMA: The Journal of the American Medical Association* **295**(10):1127-34.

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Morello-Frosch R, Jesdale BM, Sadd JL, Pastor M (2010). Ambient air pollution exposure and full-term birth weight in California. *Environmental Health* **9**:44.

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DIESEL PARTICULATE MATTER

Exposure Indicator

Diesel particulate matter (diesel PM) occurs throughout the environment from both on-road and off-road sources. Major sources of diesel PM include trucks, buses, cars, ships and locomotive engines. Diesel PM is concentrated near ports, rail yards and freeways where many such sources exist. Exposure to diesel PM has been shown to have numerous adverse health effects including irritation to the eyes, throat and nose, cardiovascular and pulmonary disease, and lung cancer.

Indicator

Spatial distribution of gridded diesel PM emissions from on-road and non-road sources for a 2010 summer day in July (kg/day).

Data Source

California Air Resources Board (CARB)

The CARB produces grid-based emission estimates for a variety of pollutants by emissions category on a 4km by 4km statewide Cartesian grid system to support specific regulatory and research programs. Diesel PM emissions from on- and off-road sources were extracted for a July 2010 weekday from the latest grid-based emissions. This data source does not account for meteorological dispersion of emissions at the neighborhood scale, which can have local-scale and year-to-year variability, or significant local-scale spatial gradients known to exist within a few hundred meters of a high-volume roadway or other large source of diesel PM. Nevertheless it is a reasonable *regional* metric of exposure to diesel PM emissions.

http://www.arb.ca.gov/diesel

Rationale

Diesel PM is the particle phase of diesel exhaust emitted from diesel engines such as trucks, buses, cars, trains, and heavy duty equipment. This phase is composed of a mixture of compounds, including sulfates, nitrates, metals and carbon particles. The diesel particulate matter indicator is distinct from other air pollution indicators in CalEnviroScreen, PM2.5 in particular. Diesel PM includes known carcinogens, such as benzene and formaldehyde (Krivoshto *et al.*, 2008) and 50% or more of the particles are in the ultrafine range (USEPA, 2002). As particle size decreases, the particles may have increasing potential to deposit in the lung (Löndahl *et al.* 2012). The ultrafine fraction of diesel PM (aerodynamic diameter less than 0.1 µm) is of concern because researchers believe these particles penetrate deeper into the lung, can carry toxic compounds on particle surfaces, and are more biologically reactive than larger particles (Betha and Balasubramanian, 2013; Nemmar *et al.*, 2007). In urban areas, diesel PM is a major component of the particulate air pollution from traffic (McCreanor *et al.*, 2007).

Children and those with existing respiratory disease, particularly asthma, appear to be especially susceptible to the harmful effects of exposure to airborne PM from diesel exhaust, resulting in increased

asthma symptoms and attacks along with decreases in lung function (McCreanor *et al.*, 2007; Wargo, 2002).

People that live or work near heavily-traveled roadways, ports, railyards, bus yards, or trucking distribution centers may experience a high level of exposure (USEPA, 2002; Krivoshto *et al.*, 2008). People that spend a significant amount of time near heavily-traveled roadways may also experience a high level of exposure. A study of U.S. workers in the trucking industry found an increasing risk for lung cancer with increasing years on the job (Garshick *et al.*, 2008). The same trend was seen among railroad workers, who showed a 40% increased risk of lung cancer (Garshik *et al.*, 2004). Studies have found strong associations between diesel particulate exposure and exacerbation of asthma symptoms in asthmatic children who attend school in areas of heavy truck traffic (Patel *et al.* 2010, Spira-Cohen *et al.* 2011). Studies of both men and women demonstrate cardiovascular effects of diesel PM exposure, including coronary vasoconstriction and premature death from cardiovascular disease (Krivoshto *et al.*, 2008).

Exposure to diesel PM, especially following periods of severe air pollution, can lead to increased hospital visits and admissions due to worsening asthma and emphysema-related symptoms (Krivoshto *et al.*, 2008). Diesel exposure may also lead to reduced lung function in children living in close proximity to roadways (Brunekreef *et al.*, 1997).

Method

Gridded diesel PM emissions from on-road sources were calculated as follows:

- CARB's on-road emissions model, EMFAC2013, was used to calculate 2010 county-wide estimates of diesel PM emissions for a July weekday. http://www.arb.ca.gov/msei/modeling.htm
- EMFAC2013 county-wide emission estimates are spatially distributed to 4km-by-4km grid cells based on the distribution of regional vehicle activity represented in local agency transportation networks and Caltrans' statewide transportation network (where local agency data are not available) using the Direct Travel Impact model (DTIM4). Transportation networks are produced from travel demand modeling conducted by local agencies and Caltrans.

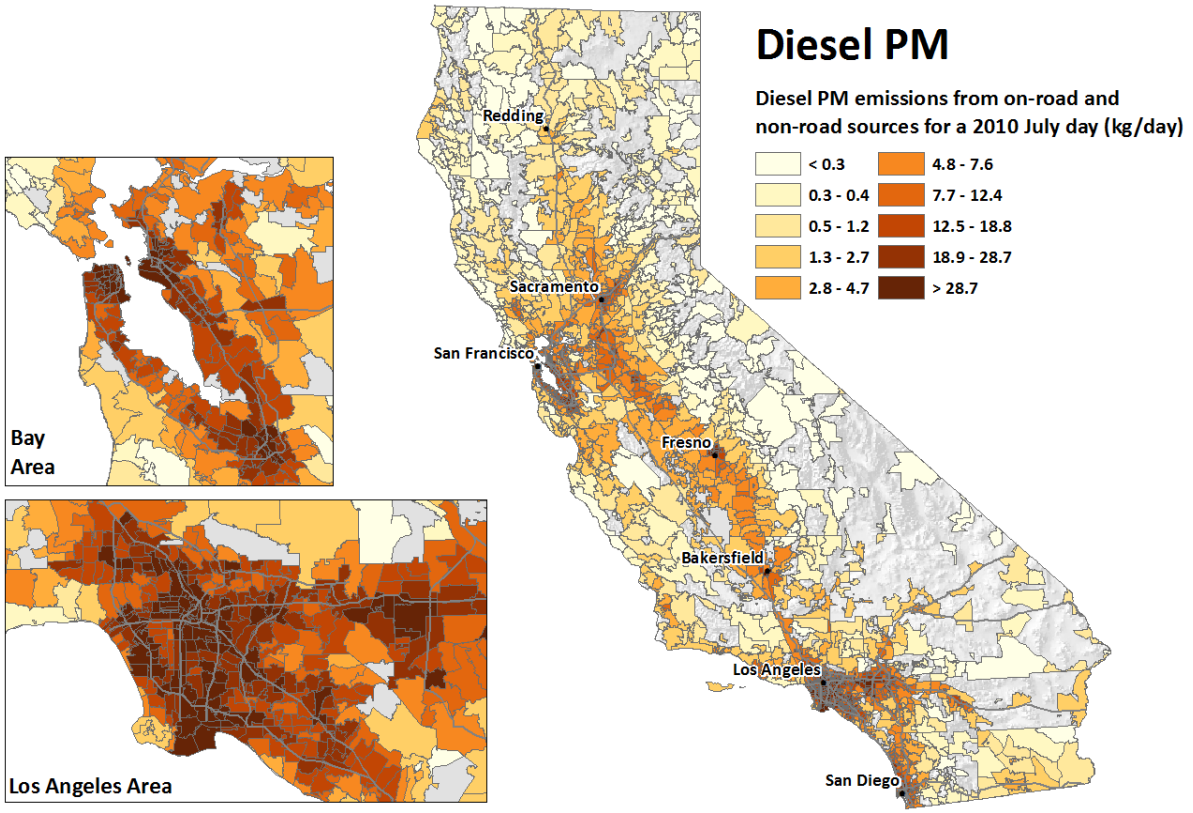
Gridded diesel PM from non-road sources were calculated as follows:

- County-wide estimates of diesel PM from non-road sources for a July weekday were extracted from CARB's emissions inventory forecasting system, CEPAM. http://www.arb.ca.gov/app/emsinv/fcemssumcat2009.php
- County-wide emission estimates are spatially distributed to 4km-by-4km grid cells based on a variety of gridded spatial surrogate datasets. Each category of emissions is mapped to a spatial surrogate that generally represents the expected sub-county

locations of source-specific activities. The surrogates include, for example: Lakes and Coastline; Population; Housing and Employment; Industrial Employment; Irrigated Cropland; Unpaved Roads; Single-Housing Units; Forrest Land; Military Bases; Non-irrigated Pasture Land; Rail Lines; Non-Urban Land; Commercial Airports; and Ports.

Resulting gridded emission estimates from the on-road and non-road categories were summed into a single gridded dataset. Gridded diesel PM emission estimates are then allocated to ZCTA zones in ArcMap using a weighted average where the proportion of a grid-cell intersecting a ZIP code is used as the weight. The resulting ZCTA totals are assigned a percentile based on the statewide distribution of values.

Indicator Map



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PESTICIDE USE

Exposure Indicator

Communities near agricultural fields, primarily farm worker communities, may be at risk for exposure to pesticides. Drift or volatilization of pesticides from agricultural fields can be a significant source of pesticide exposure. Complete statewide data on human exposures to pesticides do not exist. The most robust pesticide information available statewide are data maintained by the California Department of Pesticide Regulation showing where and when pesticides are used across the state. Pesticide use, especially use of volatile chemicals that can easily become airborne, can serve as an indicator of potential exposure. Similarly, unintended environmental damage from the use of pesticides may increase in areas with greater use.

Indicator

Total pounds of selected active pesticide ingredients (filtered for hazard and volatility) used in production-agriculture per square mile.

Data Source

Pesticide Use Reporting,
California Department of Pesticide Regulation (DPR)

In California, all agricultural pesticide use must be reported monthly to county agricultural commissioners, who report the data to DPR. California has a broad legal definition of agricultural use—production agricultural is defined as pesticides used on any plant or animal to be distributed in the channels of trade and non-production agricultural includes pesticide applications to parks and recreational lands, rights-of-ways, golf courses, and cemeteries for example. Non-agricultural control includes home, industrial, institutional, structural, vector control, and veterinary uses. Production agricultural pesticide use data are publicly available for each Meridian-Township-Range-Section (MTRS) in California and was used to create this indicator. An MTRS, or section, is roughly equivalent to one square mile. Data are available statewide except for some areas that are exempt from reporting, such as some military and tribal lands.

Non-production agricultural and non-agricultural pesticide use data is only available at the county scale and was not included in the indicator due to the large geographic scale.

http://www.DPR.ca.gov/docs/pur/purmain.htm

Rationale

To determine whether pesticide exposure may be occurring as a result of agricultural use, DPR established a pesticide air monitoring network for agricultural areas where there is high use of pesticides likely to concentrate in air. Preliminary results for the first year of monitoring show that more than half of pesticides sampled were detected, although none were above the health screening levels (CDPR, 2012). Pesticide air monitoring is not available statewide.

High use of pesticides, however, has been correlated with exposure and with acute pesticide-related illness, and there is evidence of association with chronic disease outcomes. Pregnant, low income Latinas residing in an agricultural area of California had pesticide metabolite levels in

their urine up to 2.5 times higher than a representative sample of U.S. women (Bradman *et al.*, 2005). Some research indicates that proximity to agricultural fields is correlated with measured concentrations in homes (Bradman *et al.*, 2007; Harnly *et al.*, 2009). A recent study in California comparing farmworker homes to homes of low income urban residents found indoor concentrations of an agricultural pesticide only in homes of farmworkers (Quiros-Alcala *et al.,* 2011). Another study, based on data from the California Pesticide Use Report database, found that nearby agricultural pesticide use was significantly associated with pesticide concentrations in carpet dust (Gunier *et al.*, 2011).

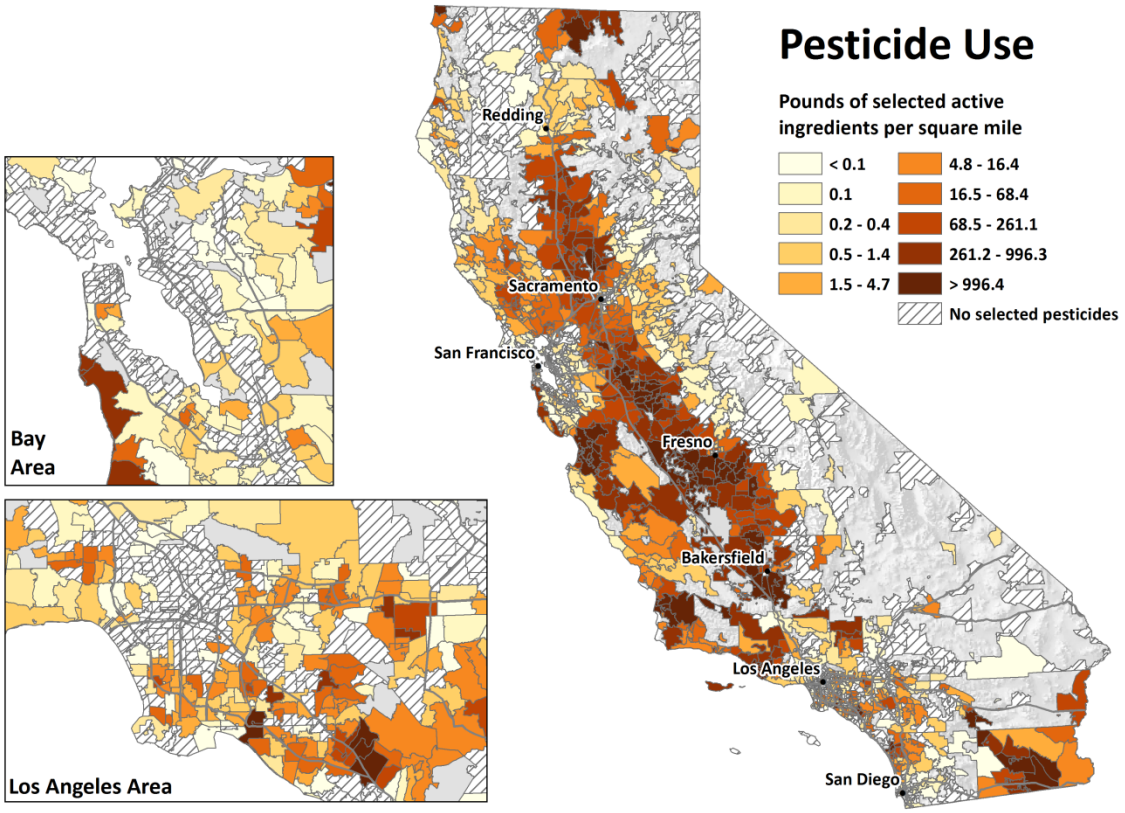
A large cohort study of male pesticide applicators found a significant association between the use of four specific insecticides and aggressive prostate cancer (Koutros *et al.*, 2012). Prenatal exposure to the organophosphate chlorpyrifos has been associated with abnormalities in brain structure in children (Rauh *et al.*, 2012). An examination of national pesticide illness data concluded that agricultural workers and residents near agriculture had the highest rates of pesticide poisoning from drift incidents. Soil fumigation accounted for most of the cases (Lee *et al.*, 2011). DPR has also documented numerous pesticide drift incidents that have led to illness in California (O'Malley *et al.*, 2005). Because of their physical and chemical characteristics, fumigants and other volatile pesticides are most likely to be involved in pesticide drift incidents and illnesses. However, any pesticide that is applied by air or sprayed during windy conditions can drift over neighboring communities (Coronado *et al.*, 2011; Lee *et al.*, 2011).

Method

Specific pesticides included in the measure of pesticide use were narrowed from the list of all registered pesticides in use in California to focus on a subset of 66 chemicals that are filtered for hazard and volatility. Volatility is indicative of higher likelihood of drift and exposure (See Appendix).

- Production agricultural pesticide use records were obtained for the entire state for the years 2009 and 2010.
- Production pesticide use (total pounds of selected active ingredient) for MTRS records were matched to ZIP codes using a match file created in the GIS software ArcMap.
- Production pesticide use for each ZIP code was divided by each ZIP code's area.

Indicator Map



Appendix

Pesticide Use – Filter for Hazard and Volatility

Specific pesticides included in the measure of pesticide use were identified from the list of all registered pesticides through consideration of both hazard and likelihood of exposure.

The more hazardous pesticides were identified using a list generated under the Birth Defect Prevention Act of 1984 (SB 950) and the Proposition 65 list (Safe Drinking Water and Toxic Enforcement Act of 1986). As part of a review process of active ingredients under the SB 950 program, pesticides are classified as "High", "Moderate", or "Low" priority for potential adverse health effects using studies of sufficient quality to characterize risk. The prioritization of each pesticide is a subjective process based upon the nature of potential adverse effects, the number of potential adverse effects, the number of species affected, the no observable effect level (NOEL), potential human exposure, use patterns, quantity used, and US EPA evaluations and actions, among others. Proposition 65 requires the state to maintain a list of chemicals that cause cancer or reproductive toxicity. For the purpose of developing an exposure indicator, pesticides that were prioritized as "Low," not prioritized under SB 950, or not on the Proposition 65 list

were removed from the analysis.

The analysis was further limited to pesticides of high or moderate volatility. Higher volatility was considered to increase the likelihood of exposures. A list of pesticide volatilities was obtained from DPR. Pesticides not appearing on this list were researched for chemical properties in the open literature. Pesticides with volatility less than 10^{-6} mm Hg were removed from the indicator analysis.

The filtering of pesticides for both hazard and volatility resulted in a list of 66 pesticides that were included in the analysis here. The pesticides that are included in the indicator calculation are identified below.

- *1,3-Dichloropropene*
- *2,2-Dibromo-3-nitrilopropionamide (DBNPA)*
- *2,2-dichlorovinyl dimethyl phosphate (DDVP, Dichlorvos)*
- *Acephate*
- *Acrolein*
- *Aldicarb*
- *Azinphos-methyl (Guthion)*
- *Bromoxynil heptanoate*
- *Bromoxynil octanoate*
- *Buprofezin*
- *Carbaryl (Sevin)*
- *Carbofuran*
- *Chloropicrin*
- *Chlorothalonil*
- *Chlorpyrifos*
- *Chlorthal-dimethyl (DCPA, Dacthal)*
- *Clomazone*
- *Cycloate (Ro-Neet)*
- *Cyprodinil*
- *Dazomet*
- *Diazinon*
- *Dichloran*
- *Dimethoate*
- *Endosulfan**
- *Ethalfluralin*
- *Ethoprop*
- *Fenamiphos*
- *Fenpropathrin*
- *Fenthion*
- *Fludioxonil*
- *Flumioxazin*
- *Hydrogen cyanamide*
- *Imazalil*
- *Linuron*
- *Malathion*
- *Metalaxyl*
- *Metam-sodium*
- *Methamidophos (Monitor)*
- *Methidathion*
- *Methomyl*
- *Methyl bromide*
- *Methyl isothiocyanate*
- *Methyl parathion*
- *Molinate*
- *Myclobutanil*
- *Naled*
- *Oxydemeton-methyl*
- *Pentachloronitrobenzene (PCNB)*
- *Phosphine*
- *Metam-potassium*
- *Propetamphos*
- *Propoxur (Baygon)*
- *Propylene oxide*
- *Pyrimethanil*
- *S,S,S-Tributyl phoshorotrithioate (DEF)*
- *S-Ethyl dipropylthiocarbamate (EPTC)*
- *Sodium cyanide*
- *Sodium tetrathiocarbonate*
- *Sulfur dioxide*
- *Sulfuryl fluoride*
- *Thiram*
- *Triclopyr butoxyethyl ester (TBEE)*
- *Triclopyr triethylamine salt (TEA)*
- *Triflumizole*
- *Trifluralin*
- *Ziram*

* *Added based on its designation as a Toxic Air Contaminant (AB 1807 Program).*

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TOXIC RELEASES FROM FACILITIES

Exposure Indicator

There is widespread concern regarding exposures to chemicals that are released from industrial facilities. Statewide information directly measuring exposures to toxic releases has not been identified. However, some data on the *release* of pollutants into the environment is available and may provide some relevant evidence for potential subsequent exposures. The U.S. Environmental Protection Agency maintains a toxic substance inventory of on-site releases to air, water, and land and underground injection of any classified chemical, as well as quantities transferred off-site. The data are reported by each facility.

Indicator

Total toxicity-weighted pounds of chemicals released on-site to air or water from all facilities within the ZIP code, or within one kilometer of the ZIP code.

Data Source

Toxics Release Inventory (TRI) and
Risk Screening Environmental Indicators (RSEI),
U.S. Environmental Protection Agency (US EPA)

TRI is a database of self-reported disposal or other releases and waste management activities for certain listed toxic chemicals. It is updated annually. The TRI program was created by the federal Emergency Planning and Community Right-to-Know Act (EPCRA) and Pollution Prevention Act. The chemicals included in the database are those on EPCRA:

- Chemicals identified in EPCRA Section 313 (593 individually listed chemicals and 30 chemical categories including 3 delimited categories containing 62 chemicals); and
- Persistent, Bioaccumulative and Toxic (PBT) Chemicals (16 specific chemicals and 4 chemical classes).

Facilities are required to report if they have 10 or more full-time employees, operate within a set of industrial sectors outlined by TRI, and manufacture more than 25,000 pounds or otherwise use more than 10,000 pounds of any listed chemical during the calendar year. Lower reporting thresholds apply for PBT chemicals (10 or 100 pounds) and dioxin-like chemicals (0.1 gram).

RSEI is a computer-based chronic health screening tool developed by US EPA. It includes chemical-specific toxicity weights, which can be applied to TRI emissions data to produce a toxicity-weighted result. These weights are drawn from various programs of the US EPA, Cal/EPA, and the Agency for Toxic Substances and Disease Registry. For each facility, individual chemical weights are multiplied by the pounds of the chemical reported released. These are summed across all chemicals reported by the facility for the total toxicity-weighted pounds. Using this metric helps to incorporate toxicity considerations into the emissions data.

http://www.epa.gov/tri/index.htm
http://www.epa.gov/oppt/rsei/pubs/technical_appendix_a_toxicity_v2.3.1.pdf

Rationale

The Toxics Release Inventory (TRI) provides public information on emissions and releases into the environment from a variety of facilities across the state. TRI data do not, however, provide information on the extent of public exposure to these chemicals. That said, US EPA has stated that "[d]isposal or other releases of chemicals into the environment occur through a range of practices that could ultimately affect human exposure to the toxic chemicals ." (US EPA, 2010). A study of pollution in the printed wiring board industry found that among states with high TRI emissions in 2006, RSEI risk scores for California were by far the highest. According to the study, California combines high toxic emissions with a high risk score, based on location, composition of emissions and population exposure modeling (Lam *et al.*, 2011).

Air monitoring data at hundreds of locations across the United States have identified over a dozen hazardous air pollutants at concentrations that exceed California cancer or non-cancer benchmarks (McCarthy *et al.*, 2009). Many of the locations that these authors found to have elevated levels are near major industrial sources, and many of the chemicals monitored are the same as those that are emitted from these facilities. In California, a study that modeled concentrations of air toxic chemicals found significant levels of risk (Morello-Frosch *et al.*, 2000). Although this study found that mobile sources accounted for a major portion of the risk, the authors pointed out that for some communities, local industrial sources were a major contributor.

In addition to routine chemical releases, some communities located near TRI facilities are at risk from exposure to accidental chemical releases. A study of self-reported accident rates at U.S. chemical facilities over a five year period reported that 1,205 facilities (7.8% of facilities in the database) had at least one accident during the reporting period, and an additional 355 facilities (2.3%) had multiple accidents during the reporting period (Kleindorfer *et al.*, 2003). Associated with these events were a total of 1,987 injuries and 32 deaths among workers, and 167 injuries among nonemployees, including emergency responders. There were 215 total hospitalizations and 6,057 individuals given other medical treatments. Over 200,000 community residents were involved in evacuations and shelter-in-place incidents over that five year period.

Several studies have examined the potential for health effects from living near TRI facilities. For example, a case-control study reported an increase in risk for diagnosis of brain cancer in children of mothers living within a mile of a TRI facility that released carcinogens (Choi *et al.*, 2006). In another study, TRI air and water concentrations were associated with an increase in infant, but not fetal, mortality rates (Agarwal *et al.*, 2010).

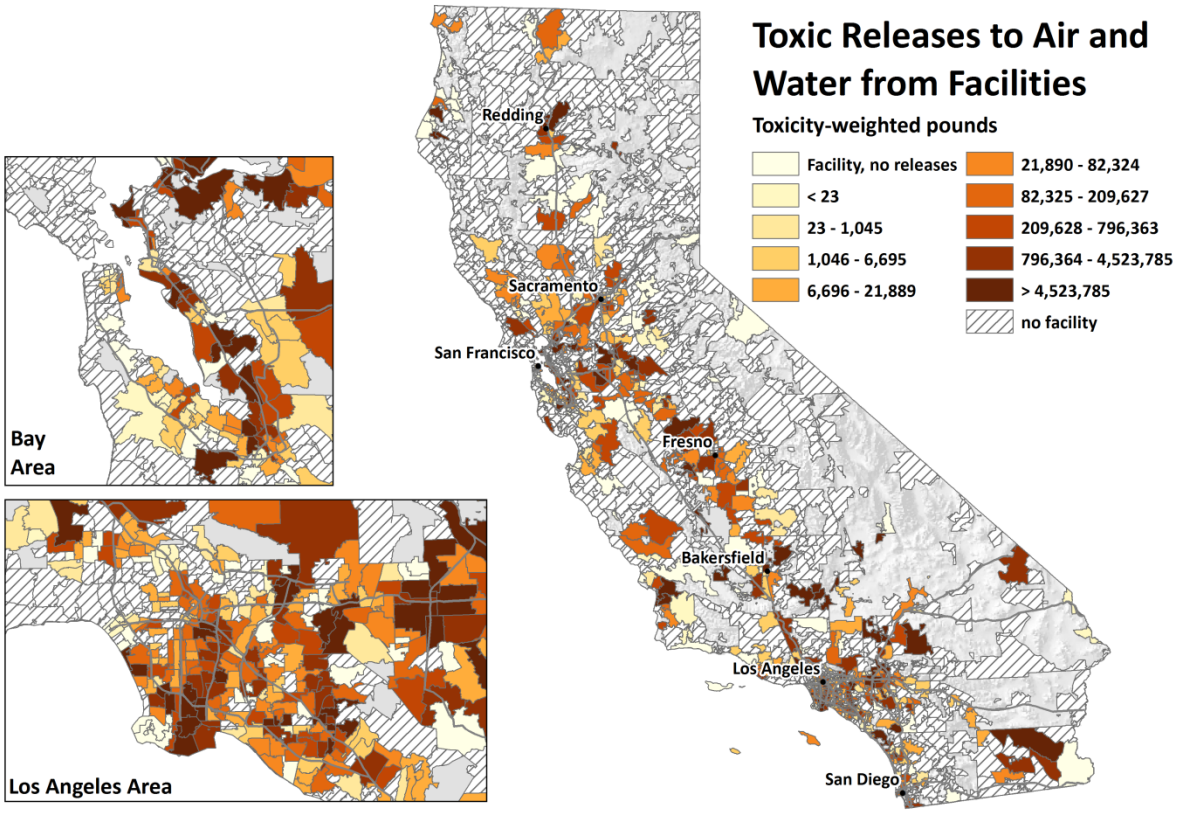
Multiple studies have observed greater emissions in low-income and

disadvantaged areas (Szasz and Meuser, 1997). Additionally, race and ethnicity have been correlated with the presence of toxic release facilities. People of color in studied regions of southern California were found to have a greater likelihood of living in areas with higher toxic releases (Morello-Frosch *et al.*, 2002; Sadd *et al.*, 1999).

Method

- Data on the location and toxicity-weighted emissions for facilities in California, or within one kilometer of California, were extracted from TRI using the TRI.NET program for 2008, 2009, and 2010. (http://www.epa.gov/tri/tridotnet/index.html)
- Toxicity-weighted on-site emissions to air and water were selected. (Releases to land and off-site transfers were excluded.)
- Facility locations with a valid latitude and longitude were mapped. Facility locations with address only were geocoded (ArcMap).
- A 1 kilometer (km) circular buffer (~3.14 km^2) was placed around each facility.
- ZIP codes were scored by summing the toxicity-weighted pounds of emissions for all facilities within the ZIP code or within one kilometer of the ZIP code, using an area-apportionment method:
  - If the 1 km buffer of a facility was fully located within a ZIP code, the toxicity-weighted pounds were fully applied to the ZIP code.
  - If the 1 km buffer crossed adjacent ZIP code(s), a portion of the toxicity-weighted pounds was applied to the ZIP codes based on the portion of the buffer located in each ZIP code area. For example, if the measured area of a facility's buffer was half in one ZIP code and half in another, 50 percent of the toxicity-weighted pounds was assigned to each ZIP code.
- Facilities that do not fall within the boundaries of census ZIP codes (or within the 1 km buffer) were added to the toxicity-weighted pounds of the census ZIP code that corresponds to the facility's ZIP code reported in the TRI database.
- For a three-year average, toxicity-weighted emissions by ZIP code were calculated for the years 2008 to 2010, individually, and then averaged.
  - ZIP codes were assigned a percentile based on their position in the distribution of ZIP codes with a facility located within it or within 1 km of the ZIP code. (If facilities are located within a ZIP code but all had no reported emissions for 2008-2010, the ZIP code is assigned the lowest percentile value.)

Indicator Map



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TRAFFIC DENSITY

Exposure Indicator

While California has the strictest auto emissions standards in the U.S., the state is also known for its freeways and heavy traffic. Traffic is a significant source of air pollution, particularly in urban areas, where more than 50% of particulate emissions come from traffic. Exhaust from vehicles contains a large number of toxic chemicals, including nitrogen oxides, carbon monoxide, and benzene. Traffic exhaust also plays a role in the formation of photochemical smog. Health effects of concern from these pollutants include heart and lung disease, cancer, and increased mortality.

Indicator

Traffic density – Sum of traffic volumes adjusted by road segment length (vehicle-kilometers per hour) divided by total road length (kilometers) within 150 meters of the ZIP code boundary.

Data Source

Traffic Volume Linkage Tool,
California Environmental Health Tracking Program (CEHTP)
Environmental Health Investigations Branch,
California Department of Public Health

Data on the amount of traffic traveling on major roadways statewide are available. Traffic data are compiled under the California Department of Transportation's (Caltrans) Highway Performance Monitoring System (HPMS) every four years. The data consist of traffic volumes along various pre-defined segments of roadways across the state. Locally maintained roads are not included in the data.

A Traffic Volume Linkage Tool developed under CEHTP uses the annual average daily traffic (AADT) volumes from the 2004 HPMS data to calculate traffic-related metrics within a circular buffer of any geographic coordinate in California.

For this analysis, CEHTP used the 2004 HPMS data and the Traffic Volume Linkage Tool to calculate traffic density within a 150 meter buffer of the ZIP code boundary. Traffic density was calculated as the sum of all road length-adjusted traffic volumes per hour divided by the total road length (from HPMS) in and within 150 meters of each ZIP code.

The most recent year for which data are available for use by this tool is 2004.

http://www.cehtp.org/p/tools_traffic

Rationale

Traffic density is used to represent the number of mobile sources in a specified area, resulting in human exposures to chemicals that are released into the air by vehicle exhaust, as well as other effects related to large concentrations of motor vehicles. Major roadways have been associated with a variety of effects on communities, including noise, vibration, injuries, and local land use changes such as increased numbers of gas stations. For example, motorists often detour through residential

streets near major roads in order to avoid congestion or traffic controls, a phenomenon known as "rat-running"; this phenomenon can increase risk of injuries among pedestrians or bicyclists in these communities. Vehicle speed is directly associated with risk of pedestrian fatality, and speeds along major roadways tend to be higher than normal speeds on residential streets.

Studies have shown that non-white and low income people make up the majority of residents in high-traffic areas (Gunier *et al.* 2003; Tian *et al.*, 2013) and that schools that are located near busy roads are more likely to be in poor neighborhoods than those farther away (Green *et al.* 2004). In addition, children who live or attend schools near busy roads are more likely to suffer from asthma and bronchitis than children in areas with lower traffic density. This relationship has been seen in both developed (Patel *et al., 2011;* Schultz *et al.* 2012) and developing countries (Baumann *et al.*, 2011).

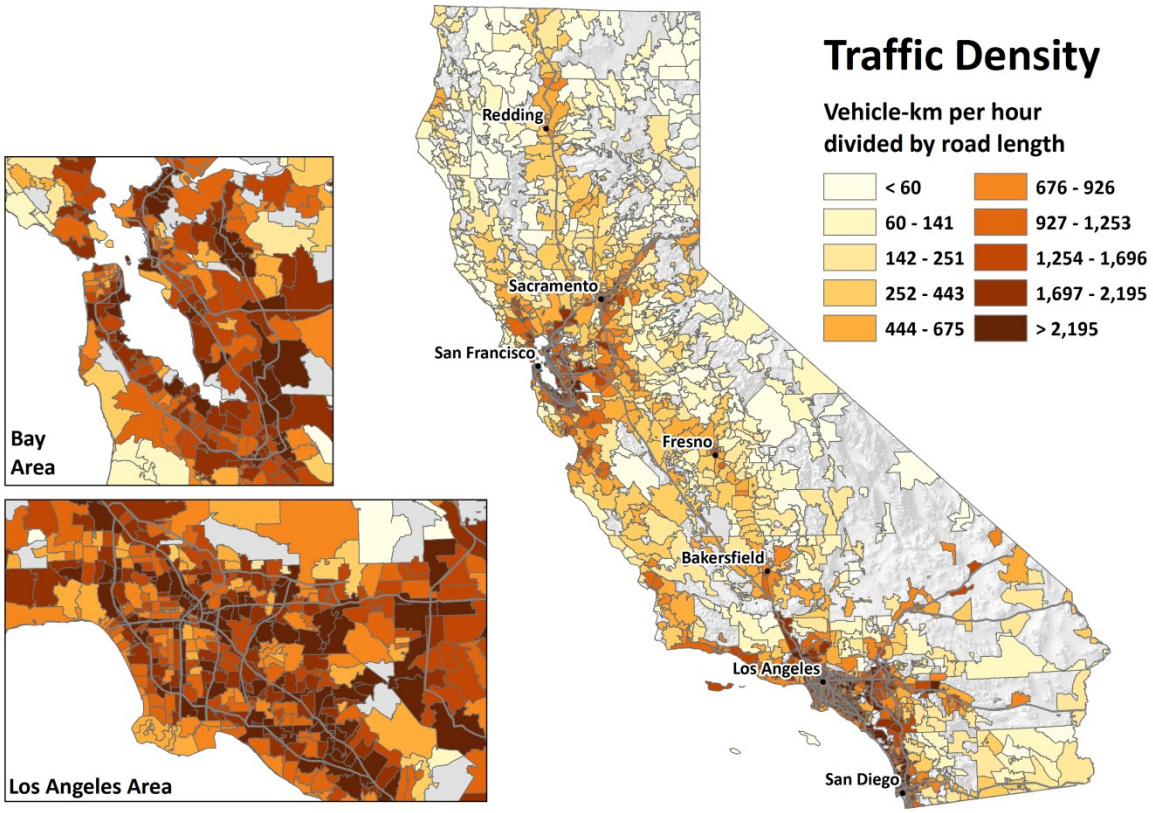
Exposure to air pollutants from vehicle emissions has been linked to adverse birth outcomes, such as low birth weight and preterm birth (Ghosh *et al.*, 2012; Ritz *et al.* 2007). A recent study of children in Los Angeles found that those with the highest prenatal exposure to traffic-related pollution were up to 15% more likely to be diagnosed with autism than children of mothers in the lowest quartile of exposure (Becerra *et al.*, 2013). The Atherosclerosis in Communities study, a cohort study with over 15,000 participants, found that traffic density and distance to roadways were associated with reduced lung function in adult women (Kan *et al.*, 2007). Road density and traffic volume were associated with adult male mortality from cardiovascular disease in an urban area in Brazil (Habermann and Gouveia, 2012). Motor vehicle exhaust is also a major source of polycyclic aromatic hydrocarbons (PAH), which can damage DNA and may cause cancer (IARC, 2010).

Method

- A 150 meter buffer was placed around each of the census ZIP codes in California. A buffer was chosen to account for roadways near ZIP code boundaries. The selected buffer distance of 150 meters, or about 500 feet, is taken from the California Air Resources Board Air Quality and Land Use Handbook recommendations, which states that most particulate air pollution from traffic drops off after approximately 500 feet (CARB, 2005).
- The buffered boundaries were put into the Traffic Volume Linkage Tool.
- Traffic density was calculated using two metrics from the tool: 1) the sum of all length-adjusted traffic volumes within the buffered ZIP code (vehicle-km/hr), then divided by 2) the sum of the length of all road segments within the buffered ZIP code (km).
- Due to differences in the length of road segments within Highway Performance Monitoring (HPMS), a length-adjusted traffic volumes metric was selected. This metric multiplies traffic volumes by length of the road segment in HPMS.
- Traffic density is calculated as traffic volumes (adjusted by road

segment lengths) divided by the total road length within the 150 meter buffer of each ZIP code (vehicles-km/hr/km).
- ZIP codes were sorted by traffic density and assigned percentiles based on the distribution.

Indicator Map



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CLEANUP SITES

Environmental Effects Indicator

Sites undergoing cleanup actions by governmental authorities or by property owners have suffered environmental degradation due to the presence of hazardous substances. Of primary concern is the potential for people to come into contact with these substances. Some of these "brownfield" sites are also underutilized due to cleanup costs or concerns about liability. The most complete set of information available related to cleanup sites and brownfields in California is maintained by the Department of Toxic Substances Control.

Indicator

Sum of weighted sites within each ZIP code.

Since the nature and the magnitude of the threat and burden posed by hazardous substances vary among the different types of sites as well as the site status, the indicator takes both into account.

Data Source

EnviroStor Cleanup Sites Database,
Department of Toxic Substances Control (DTSC)
Agency for Toxic Substances and Disease Registry (ATSDR) Hazardous Waste Site Polygon Data with CIESIN Modifications, v1 (2008)

EnviroStor is a public database that provides access to information maintained by DTSC on site cleanup. The database contains information on numerous types of cleanup sites, including Federal Superfund, State Response, Corrective Action, School Cleanup, Voluntary Cleanup, Tiered Permit, Evaluation, Historical, and Military Evaluation sites. The database contains information related to the status of the site such as required cleanup actions, involvement/land use restriction, or "no involvement."

The Columbia University Center for International Earth Science Information Network (CIESIN) maintains and distributes the dataset for National Priorities List (NPL) Superfund sites nationwide. The data come in polygon format and generally represent the parcel boundaries of the sites. These data represent a subset of the larger Hazardous Waste Polygon Database, originally developed by the Center for Disease Control's Geospatial Research, Analysis, and Services Program.

http://www.envirostor.dtsc.ca.gov/public/
http://sedac.ciesin.columbia.edu/data/set/superfund-atsdr-hazardous-waste-site-ciesin-mod-1996

Rationale

Contaminated sites can pose a variety of risks to nearby residents. Hazardous substances can move off-site and impact surrounding communities through volatilization, groundwater plume migration, or windblown dust. Studies have found levels of organochlorine pesticides in blood (Gaffney *et al.* 2005) and toxic metals in house dust (Zota *et al.* 2011) that were correlated with residents' proximity to contaminated sites.

A study of pregnant women living near Superfund sites in New York state found an increased risk of having a low birth weight male child

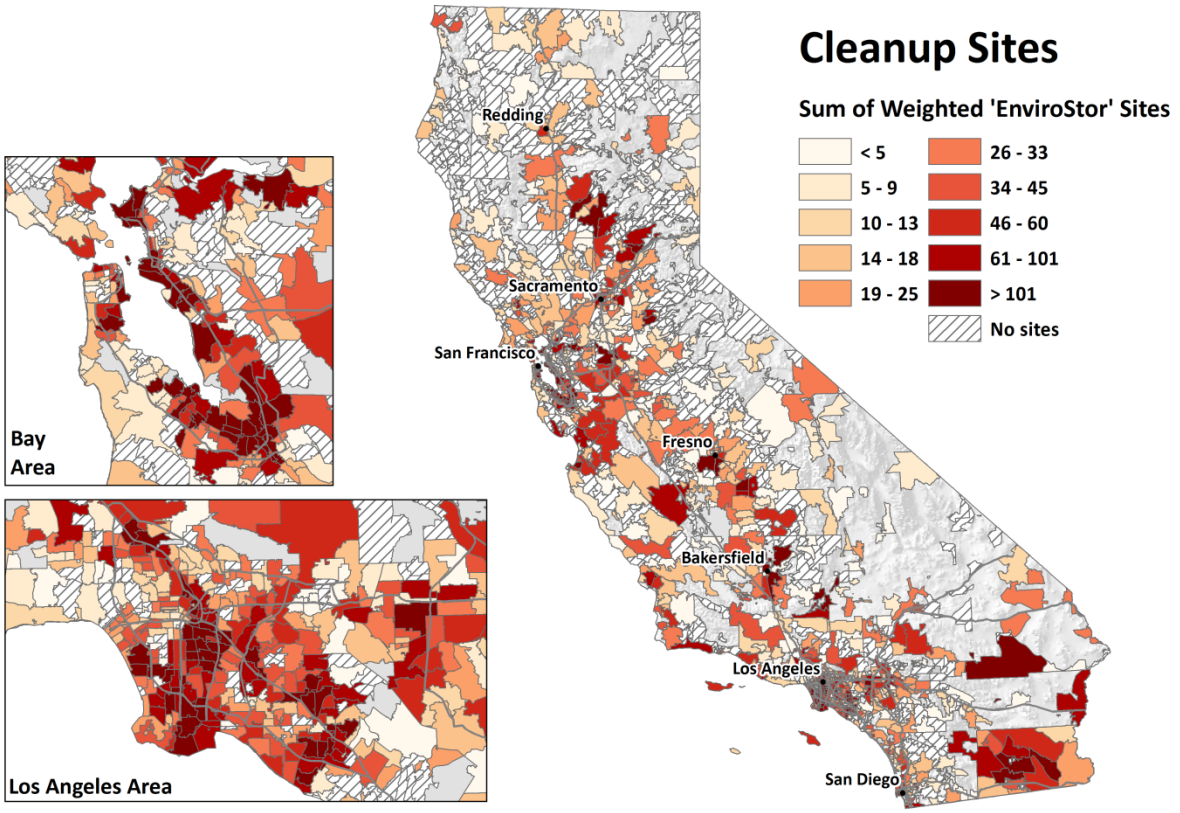
(Baibergenova *et al*. 2003). A later study in New York City found an association between prevalence of liver disease and the number of Superfund sites per 100 square miles (Ala *et al*. 2007). A demographic study of socioeconomic factors in communities in Florida found that census tracts with Superfund sites had significantly higher proportions of African Americans, Latinos and people employed in "blue collar" occupations than census tracts that did not contain a Superfund site (Kearney and Kiros, 2009). Some of the relationships between CalEnviroScreen scores and race have been added to the final section of this report.

It generally takes many years for a site to be certified as clean, and cleanup work is often delayed due to cost, litigation, concerns about liability or detection of previously unrecognized contaminants. Contaminated sites also have the potential to degrade nearby wildlife habitats, resulting in potential ecological impacts as well as threats to human health.

Method

- Data on cleanup site type, status, and location (coordinate or address) for the entire state were downloaded from the EnviroStor Cleanup Sites database.
- Several types of sites and statuses were excluded from the analysis because they indicate neither the presence of hazardous waste nor potential environmental risk (See Appendix).
- Each remaining site was scored on a weighted scale of 2 to 12 in consideration of both the site type and status (See Appendix). Higher weights were applied to Superfund, State Response sites, and cleanups compared to evaluations, for example. Similarly, higher weights were applied to sites that are undergoing active remediation and oversight by DTSC, relative to those with little or no state involvement.
- Sites with a valid latitude and longitude were mapped and sites with address only were geocoded in ArcMap.
- Agency for Toxic Substances and Disease Registry (ATSDR) Hazardous Waste Site polygon data were downloaded from the CIESIN website.
- Polygon sites in California on the NPL were identified. Sites were assigned a score of 12 (as a federal Superfund site).
- EnviroStor sites with a NPL polygon representation were replaced.
- All sites, including NPL polygon sites, were assigned a 250-meter buffer.
- Each ZIP code was scored based on the sum of the weighted sites it contains and the buffers that it intersects.
- Summed ZIP code ranks were assigned percentile scores.

Indicator Map



References

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Appendix

Weighting Matrix for Cleanup Sites

Cleanup Sites from the EnviroStor Cleanup Sites database were weighted on a scale of 0 to 12 in consideration of both the site type and status. The following table shows the weights applied for each site type and status.

Site and status types excluded from the analysis:
School Investigation and *Border Zone/Hazardous Waste Evaluation* site types were not included in the analysis. Sites with the following statuses were also not included in the analysis: *Agreement – Work Completed*, *Referrals*, *Hazardous Waste Disposal Land Use,* and *De-listed*. Sites with statuses of *Certified, Completed,* and *No Further Action* were assigned a weight of zero and were effectively not included in the analysis. These sites and status types were excluded because they are not indicative of hazardous waste or potential environmental risk.

For a given ZIP code, the weighted scores of all facilities in the area were summed. Definitions used in the table are defined below.

Site Type	Status		
	Low • Certified • Completed • No Further Action	**Medium** • Inactive-Needs Eval. • Inactive • Certified Operation & Maintenance – Land Use Restrictions • Certified Operation & Maintenance	**High** • Active • Backlog • Inactive- Action Required
Low • Evaluation • Historical • Military Evaluation	0	4	6
Medium • Corrective Action • School Cleanup • Voluntary Cleanup • Tiered Permit	1	7	9
High • State Response • Superfund	2	10	12

Definitions*

- *Active*: Identifies that an investigation and/or remediation is currently in progress and that DTSC is actively involved, either in a lead or support capacity.
- *Certified Operation and Maintenance (O&M)*: Identifies sites that have certified cleanups in place but require ongoing O&M activities.
- *Certified*: Identifies completed sites with previously confirmed releases that are subsequently certified by DTSC as having been remediated satisfactorily under DTSC oversight.
- *Corrective Action*: Identifies sites undergoing "corrective action," defined as investigation and cleanup activities at hazardous waste facilities (either Resource Conservation and Recovery Act (RCRA) or State-only) that either were eligible for a permit or received a permit. These facilities treat, store, dispose and/or transfer hazardous waste.
- *Evaluation*: Identifies suspected, but unconfirmed, contaminated sites that need or have gone through a limited investigation and assessment process.
- *Inactive – Action Required*: Identifies non-active sites where, through a Preliminary Endangerment Assessment (PEA) or other evaluation, DTSC has determined that a removal or remedial action or further extensive investigation is required.
- *Inactive - Needs Evaluation*: Identifies inactive sites where DTSC has determined a Preliminary Endangerment Assessment or other evaluation is required.

- *No Further Action*: Identifies completed sites where DTSC determined after investigation, generally a PEA (an initial assessment), that the property does not pose a problem to public health or the environment.
- *School Cleanup*: Identifies proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination at which remedial action occurred.
- *State Response*: Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.
- *Superfund*: Identifies sites where the US EPA proposed, listed, or delisted a site on the National Priorities List (NPL).
- *Voluntary Cleanup*: Identifies sites with either confirmed or unconfirmed releases, and the project proponents have requested that DTSC oversee evaluation, investigation, and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

* EnviroStor Glossary of Terms
(http://www.envirostor.dtsc.ca.gov/public/EnviroStor%20Glossary.pdf)

GROUNDWATER THREATS

Environmental Effects Indicator

Many activities can pose threats to groundwater quality. These include the storage and disposal of hazardous materials on land and in underground storage tanks at various types of commercial, industrial, and military sites. Thousands of storage tanks in California have leaked petroleum or other hazardous substances, degrading soil and groundwater. Storage tanks are of particular concern when they can affect drinking water supplies. Storage tank sites can expose people to contaminated soil and volatile contaminants in air. In addition, the land surrounding these sites may be taken out of service due to perceived cleanup costs or concerns about liability. The most complete set of information related to sites that may impact groundwater and require cleanup is maintained by the State Water Resources Control Board.

Indicator

Sum of weighted scores for sites within each ZIP code.

The nature and the magnitude of the threat and burden posed by sites maintained in GeoTracker vary significantly by site type (e.g., leaking underground storage tank or cleanup site) and status (e.g., Completed Case Closed or Active Clean up). Thus, the indicator takes into account information about both the type of site and its status.

Data Source

GeoTracker Database,
State Water Resources Control Board (SWRCB)

GeoTracker is a public web site that allows the SWRCB, regional water quality control boards and local agencies to oversee and track projects at cleanup sites that can impact groundwater. The GeoTracker database contains information on locations and water quality of wells that could be contaminated, as well as potential sources of groundwater contamination. These include leaking underground storage tanks (LUSTs), leaking military underground storage tanks (USTs) cleanup and land disposal sites, and cleanup sites, industrial sites, airports, dairies, dry cleaners, and publicly-owned sewage treatment plants. For each site, there is additional information on the status of cleanup activities. Groundwater quality data are extracted from monitoring and records maintained by SWRCB, the Department of Water Resources, Department of Public Health, Department of Pesticide Regulation, U.S. Geological Survey and Lawrence Livermore National Laboratory. The database is constantly updated and sites are never deleted from the database, where they may ultimately be designated 'clean closed.'

A separate GeoTracker database contains information on the location of underground storage tanks (not leaking), which was not used.

http://geotracker.waterboards.ca.gov/

Rationale

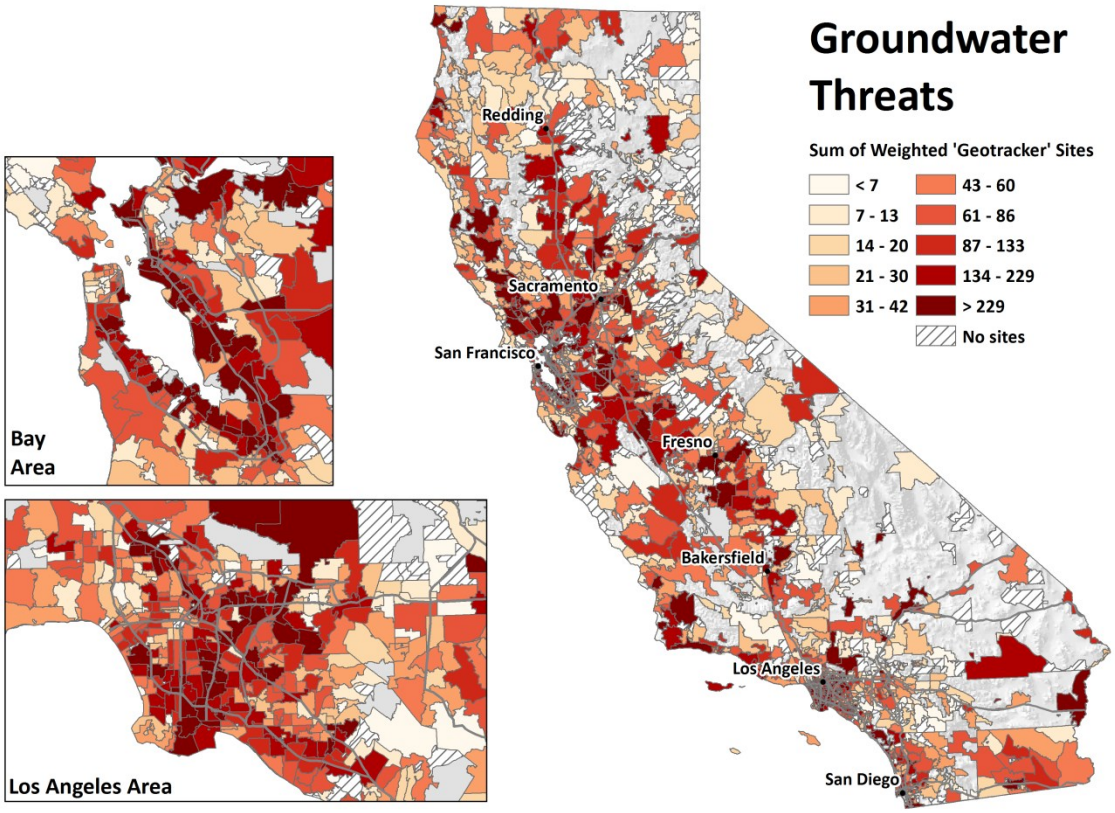
Common groundwater pollutants found at LUST and cleanup sites in California include gasoline and diesel fuels, chlorinated solvents and other volatile organic compounds (VOCs) such as benzene, toluene, and methyl tert-butyl ether (MTBE); heavy metals such as lead, chromium and

arsenic; polycyclic aromatic hydrocarbons (PAHs); persistent organic pollutants like polychlorinated biphenyls (PCBs); DDT and other insecticides; and perchlorate (SWRCB, 2012; DPR, 2011; US EPA, 2002). Dioxins and dioxin-like substances have been detected in groundwater in areas where treated wastewater has been used for irrigation (Mahjoub *et al.*, 2011) and near wood treatment facilities (Karouna-Renier *et al.*, 2007). The occurrence of storage tanks, leaking or not, provides a good indication of potential concentrated sources of some of the more prevalent compounds in groundwater. For example, the detection frequency of VOCs found in gasoline is associated with the number of UST or LUST sites within one kilometer of a well (Squillace and Moran, 2007). The occurrence of chlorinated solvents in groundwater is also associated with the presence of cleanup sites (Moran *et al.*, 2007). Some of these cancer-causing compounds have in turn been detected in drinking water supplies in California (Williams *et al.*, 2002). People who live near shallow groundwater plumes containing VOCs may also be exposed via the intrusion of vapors from soil into indoor air (Picone *et al.*, 2012; Yao *et al.*, 2013).

Method

- Data on cleanup site type, status, and location (coordinate or address) for the entire state were downloaded from GeoTracker (http://geotracker.waterboards.ca.gov/data_download.asp; GeoTracker Cleanup Sites).
- Certain types of sites and statuses were excluded from the analysis because they are not indicative of a hazard or a potential environmental risk (see Appendix).
- Each remaining site was scored on a weighted scale of 3 to 15 in consideration of both the site type and status.
- Sites with a valid latitude and longitude were mapped and sites with address only were geocoded in ArcMap. Sites without a valid latitude and longitude or unrecognizable address were excluded from the analysis.
- Sites were assigned a 250-meter buffer.
- Each ZIP code was scored based on the sum of the weighted sites it contains and the buffers it intersects.
- Summed ZIP code scores were assigned percentiles.

Indicator Map



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Appendix

Weighting Matrix for Groundwater Threats

Groundwater threats from the GeoTracker database were weighted on a scale of 3 to 15 in consideration of both the site type and status. The following table shows the weights applied for each site type and status.

Sites with a status type of *Completed – Case Closed* and *Open-Referred* were excluded from the analysis.

For a given ZIP code, the weighted scores of all facilities in the area were summed.

	Status	
	Low • **Open** • **Open—Inactive Open** • **Open—Verification Monitoring**	**High** • **Open—Remediation** • **Open—Reopen** • **Open—Site Assessment** • **Open—Site Assessment & Remedial Action**
Low • **LUST Cleanup Program** • **Military Underground Storage Tanks**	**3**	**5**
Medium • **Land Disposal Site**	**6**	**10**
High • **Cleanup Program Site** • **Military Privatized Site** • **Military Cleanup Site**	**9**	**15**

Definitions*

- *Cleanup Program Site* (Site Cleanup Program): In general, Site Cleanup Program sites are areas where a release of pollutants has occurred that is not addressed in the other core regulatory programs (e.g., permitted facilities, USTs). The funding for the Program is primarily cost reimbursement from responsible parties.
- *Completed - Case Closed:* A closure letter or other formal closure decision document has been issued for the site.
- *Land Disposal Site:* The Land Disposal program regulates water quality aspects of discharges to land for disposal, treatment, or storage of waste at waste management facilities and units such as landfills, waste piles and land treatment units under California

Code of Regulations, Title 27. A land disposal unit is an area of land, or a portion of a waste management facility, at which waste is discharged.

- *Military Cleanup Site:* Military Cleanup Program sites are areas where a release of pollutants from an active or closed military facility has occurred. The military fully funds for the Program oversight.
- *Military Privatized Site:* These sites are within the Site Cleanup Program. They are unique because these sites have been transferred by the military into non-military ownership with or without further cleanup necessary.
- *Military Underground Storage Tanks (UST):* Military UST Program sites are areas where a release of pollutants from an underground storage tank has occurred at a military or former military installation. The military fully funds for the Program oversight costs.
- *Open – Eligible for Closure:* Identifies cases that meet the general and media-specific criteria established in the SWRCB Low-Threat Underground Storage Tank Policy Case Closure Policy.
- *Open – Inactive:* Identifies inactive cases where a Regional Water Quality Control Board and/or a local agency have determined a site assessment or other evaluation is required. The case may also be inactive if a responsible party appears to be recalcitrant and or has inadequate funding.
- *Open – Remediation:* Identifies sites that have on-going cleanup activities designed to remove or destroy in-place the most readily recoverable fraction of source-area mass.
- *Open – Site Assessment and Interim Remedial Action:* An interim remedial action is occurring at the site and additional activities such as site characterization, investigation, risk evaluation, and/or site conceptual model development are occurring.
- *Open – Site Assessment:* Activities such as site characterization, investigation, risk evaluation, and/or conceptual site model development are occurring.
- *Open – Verification Monitoring:* Identifies sites that have recently completed remedial actions and the RWQCB and or a local agency have requested post remediation sampling to assess the post remediation conceptual site model.

HAZARDOUS WASTE FACILITIES AND GENERATORS

Environmental Effects Indicator

Most hazardous waste must be transported from hazardous waste generators to permitted recycling, treatment, storage, or disposal facilities (TSDF) by registered hazardous waste transporters. Most shipments must be accompanied by a hazardous waste manifest. There are widespread concerns for both human health and the environment from sites that serve for the processing or disposal of hazardous waste. Many newer facilities are designed to prevent the contamination of air, water, and soil with hazardous materials, but even newer facilities may negatively affect perceptions of surrounding areas in ways that have economic, social and health impacts. The Department of Toxic Substances Control maintains data on permitted facilities that are involved in the treatment, storage, or disposal of hazardous waste as well as information on hazardous waste generators.

Indicator

Sum of weighted permitted hazardous waste facilities and hazardous waste generators within each ZIP code.

Data Source

EnviroStor Hazardous Waste Facilities Database and
Hazardous Waste Tracking System,
Department of Toxic Substances Control (DTSC)

EnviroStor is a public web site that provides access to detailed information on hazardous waste permitted facilities. Information included in the database includes the facility name and address, geographic location, facility type and status.

DTSC also maintains information on the manifests created for the transport of hazardous waste from generators in its Hazardous Waste Tracking System. Manifests include the generators' name and identification number, the transporter, the designated recipient and description of the type and quantity of waste classified by a coding system. Data are currently available for 2009.

http://www.envirostor.dtsc.ca.gov/public/data_download.asp
http://hwts.dtsc.ca.gov/

Rationale

Hazardous waste by definition that is potentially dangerous or harmful to human health or the environment. U.S. EPA and DTSC both have standards for determining when waste materials must be managed as hazardous waste. Hazardous waste can be liquids, solids, or contained gases. It can include manufacturing by-products, and discarded used or unused materials such as cleaning fluids (solvents) or pesticides. Used oil and contaminated soil generated from a site clean-up can be hazardous wastes (DTSC, Defining Hazardous Waste). In 1995, 97% of toxic chemicals released nationwide came from small generators and facilities (McGlinn, 2000). Generators of hazardous waste may treat waste onsite or send it elsewhere for disposal.

The potential health effects that come from living near hazardous waste

disposal sites have been examined in a number of studies (Vrijheid, 2000). While there is sometimes limited assessment of exposures that occur in nearby populations, there are studies that have found health effects, including diabetes and cardiovascular disease, associated with living in proximity to hazardous waste sites (Kouznetsova *et al.*, 2007; Sergeev and Carpenter, 2005).

Location of hazardous waste sites in communities has long been an environmental justice concern in California. For example, a recent study of 82 hazardous waste treatment, storage, and disposal facilities in Los Angeles County found that the communities most affected by the facilities are composed of working-class and ethnic minority populations living near industrial areas (Aliyu et al, 2011). A 1997 study correlated race/ethnicity with the location of hazardous waste treatment, storage and disposal facilities for both African-American and Latino populations (Boer *et al.*, 1997).

Electronic waste is defined as universal waste rather than hazardous waste by California law, and is subject to different rules for handling and transportation. However, some components of electronic devices contain hazardous materials, and facilities that collect or recycle electronic waste are potential sources of exposure to toxic chemicals (DTSC, 2010; CalRecycle, 2012).

Method

Permitted hazardous waste facilities:

- Permitted facility data were obtained from the DTSC website.
- Facilities were scored on a weighted scale in consideration of the type and permit status for the facility (See Appendix).
- Site locations were mapped or geocoded (in ArcMap).

Hazardous waste generators:

- Generator data were obtained from DTSC from the Hazardous Waste Tracking System.
- Facilities were scored on a weighted scale in consideration the type of waste (RCRA[7] waste vs. non-RCRA[8] waste) and volume generated (large quantity generator) (see Appendix).
- Class I hazardous waste facilities that did not fall within the boundaries of census ZIP codes (or within the 250 meter buffer) were assigned to the ZIP code matching the facility's postal ZIP code provided in the database.
- Site locations were mapped or geocoded (in ArcMap).

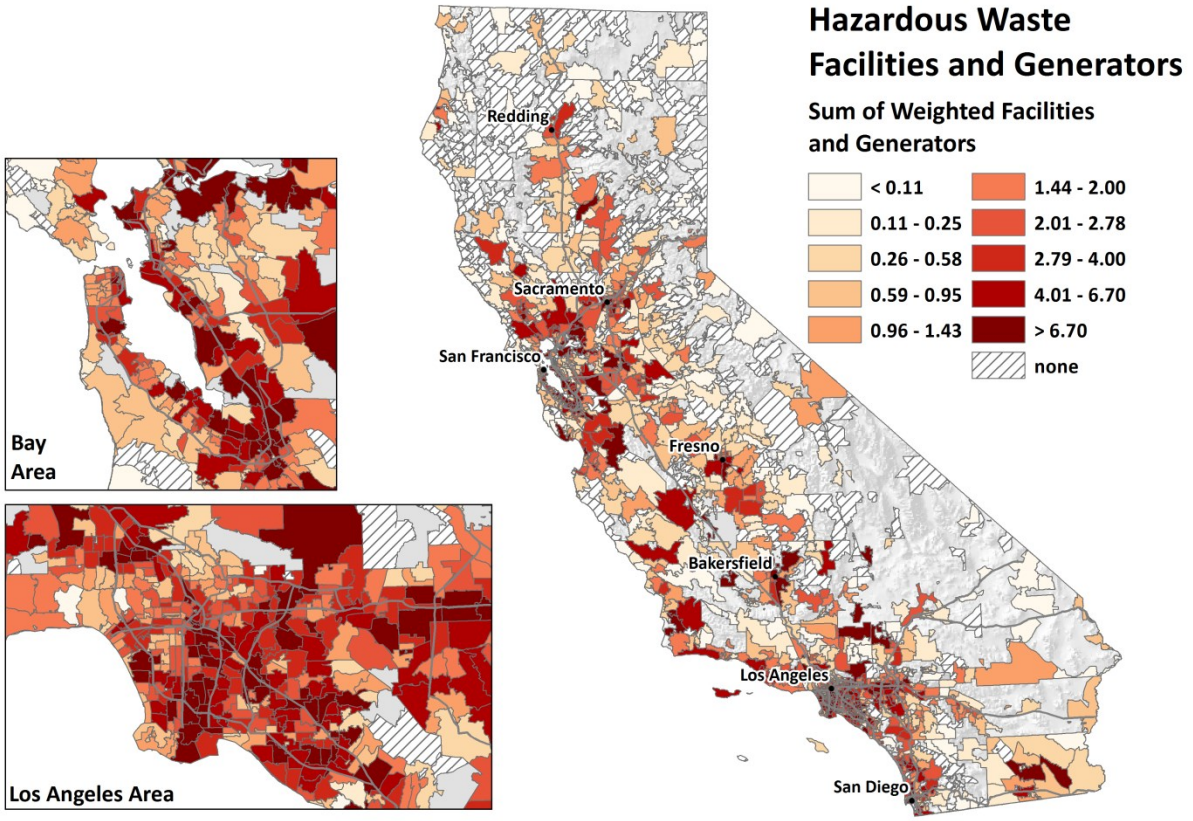
All sites were assigned a 250-meter buffer and ZIP codes were scored based on the sum of weighted sites contained in their boundaries or buffers that they intersected (in ArcMap). Summed scores were assigned

[7] RCRA: Resource Conservation and Recovery Act governs the federal management of hazardous wastes; (List of RCRA waste: http://www.epa.gov/osw/inforesources/data/br91/na_apb-p.pdf)

[8] Non-RCRA: waste streams considered hazardous in California; (List: http://www.dtsc.ca.gov/LawsRegsPolicies/Title22/upload/OEARA_REG_Title22_Ch11_AppXII.pdf)

percentiles.

Indicator Map



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Appendix

Weighting Matrix for Permitted Hazardous Waste Facilities and Hazardous Waste Generators

Permitted Hazardous Waste Facilities from DTSC's permitted facilities database were weighted on a scale of 1 to 12 in consideration of both facility activity and permit type. The score for any given Permitted Hazardous Waste Facility represents the sum of its Facility Activity and Permit Type.

Hazardous waste generators were weighted on a scale of 0.05 to 0.1, where all generators were given a base weight of 0.05. The score for hazardous waste generators is the sum of the based weight and any additional type of generator activity.

The following tables show the weights applied to the facilities and generators. Greater concerns were identified for permitted hazardous waste facilities that handle much of the hazardous waste generated from the ~30,000 generators in California. For this reason, weighting of generators was considerably lower than that for the handling facilities. Of the generators, higher weights were given for those that create RCRA waste or are large quantity generators (>1000 kg/month). For all ZIP codes, the weighted scores of all facilities in the area were summed.

Permitted Hazardous Waste Facilities

Category	Facility Activity	Permit Type
Permitted Hazardous Waste Facilities	**10** (Landfill) **7** (Treatment) **4** (Storage) **2** (Post-closure)	**1** (Large facilities) **1** (Non-RCRA facilities) **2** (RCRA facilities)

Hazardous Waste Generators

Category	Base weight	Generator activity
Hazardous Waste Generators	**0.05** (All generators)	**0.025** (Large quantity generator) **0.025** (RCRA waste)

IMPAIRED WATER BODIES

Environmental Effects Indicator

Contamination of California streams, rivers, and lakes by pollutants can compromise the use of the water body for drinking, swimming, fishing, aquatic life protection, and other beneficial uses. When this occurs, such bodies are considered "impaired." Information on impairments to these water bodies can help determine the extent of environmental degradation within an area.

Indicator

Summed number of pollutants across all water bodies designated as impaired within the area.

Data Source

303(d) List of Impaired Water Bodies,
State Water Resources Control Board (SWRCB)

The SWRCB provides information relevant to the condition of California surface waters. Such information is required by the Federal Clean Water Act. Every two years, State and Regional Water Boards assess the quality of California surface waters. Lakes, streams and rivers that do meet water quality standards, or are not expected to meet water quality standards, are listed as impaired under Section 303(d) of the Clean Water Act.

http://www.waterboards.ca.gov/rwqcb2/water_issues/programs/TMDLs/303dlist.shtml

Rationale

Rivers, lakes, estuaries and marine waters in California are important for many different uses. Water bodies used for recreation may also be important to the quality of life of nearby residents if subsistence fishing is critical to their livelihood (Cal/EPA, 2002). Water bodies also support abundant flora and fauna. Changes in aquatic environments can affect biological diversity and overall health of ecosystems. Aquatic species important to local economies may be impaired if the habitats where they seek food and reproduce are changed. Marine wildlife like fish and shellfish that are exposed to toxic substances may potentially expose local consumers to toxic substances as well (Cal/EPA, 2002). Excessive hardness, unpleasant odor or taste, turbidity, color, weeds, and trash in the waters are types of pollutants affecting water aesthetics (Cal/EPA, 2002), which in turn can affect nearby communities.

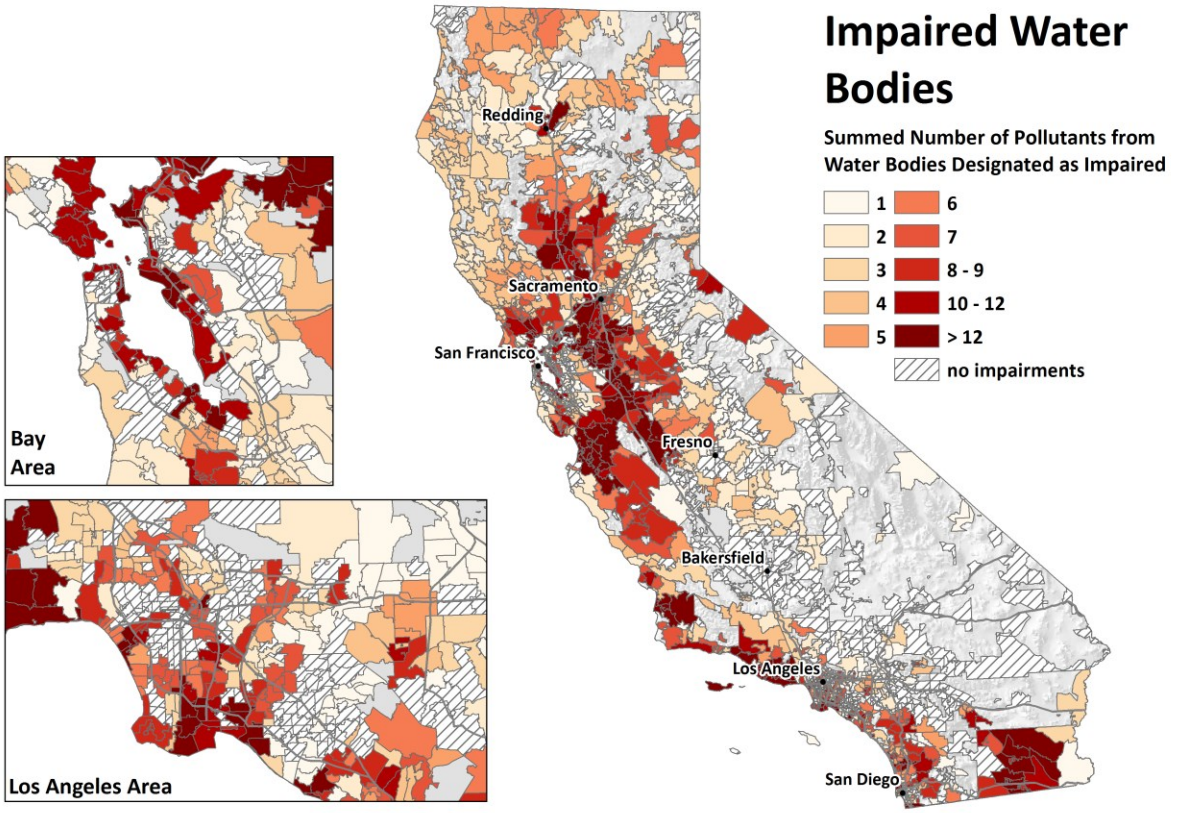
Communities of color, low-income communities, and tribes generally depend on the fish, aquatic plants, and wildlife provided by nearby surface waters to a greater extent than the general population (NEJAC, 2002). Some communities that rely on resources provided by nearby surface waters have populations of lower socioeconomic status than the general population. For example, certain fishing communities along California's northern coast have lower educational attainment and median income than California as a whole (Pomeroy *et al.*, 2010). Low-income communities in California that rely on fishing and waterfront businesses have been affected by a recent decline in the fishing

community (California State Lands Commission, 2011). Lower per capita income has been associated with increased levels of certain surface water pollutants, as have a higher percentage of minorities and people of color (Farzin and Grogan, 2012).

Method

- Data on water body type, water body ID, and pollutant type were downloaded in Excel format, and GIS data showing the visual representation of all water bodies were downloaded from the SWRCB website. http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml)
- All water bodies were identified in all ZIP codes in the GIS software ArcMap.
- The number of pollutants listed in streams and/or rivers that intersected a ZIP code were counted.
- The number of pollutants listed in lakes, bays, estuaries and/or shoreline that intersected or bordered a ZIP code were counted.
- The two pollutant counts were summed for every ZIP code.
- Each ZIP code was scored based on the sum of the number of individual pollutants found within and/or bordering it. For example, if two stream sections within a ZIP code were both listed for the same pollutant, the pollutant was only counted once.
- Summed ZIP code scores were assigned percentile scores.

Indicator Map



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SOLID WASTE SITES AND FACILITIES

Environmental Effects Indicator

Many newer solid waste landfills are designed to prevent the contamination of air, water, and soil with hazardous materials. However, older sites that are out of compliance with current standards or illegal solid waste sites may degrade environmental conditions in the surrounding area and pose a risk of exposure. Other types of facilities, such as composting, treatment and recycling facilities, may raise concerns about odors, vermin, and increased truck traffic. While data that describe environmental effects from the siting and operation of all types of solid waste facilities are not currently available, the California Department of Resources Recycling and Recovery (CalRecycle) maintains data on facilities that operate within the state, as well as sites that are abandoned, no longer in operation, or illegal.

Indicator

Sum of weighted solid waste sites and facilities.

Data Source

Solid Waste Information System (SWIS) and
Closed, Illegal, and Abandoned (CIA) Disposal Sites Program,
California Department of Resources Recycling and Recovery, CalRecycle

SWIS is a database which tracks solid waste facilities, operations, and disposal sites throughout California. Solid waste sites found in this database include landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal sites.

The CIA Disposal Sites Program is a subset of the SWIS database, and includes closed landfills and disposal sites that have not met minimum state standards for closure as well as illegal and abandoned sites. Sites within CIA have been prioritized to assist local enforcement agencies investigate the sites and enforce state standards.

http://calrecycle.ca.gov/SWFacilities/Directory/
http://www.calrecycle.ca.gov/SWFacilities/CIA/

Rationale

Solid waste sites can have multiple impacts on a community. Waste gases like methane and carbon dioxide can be released into the air from disposal sites for decades, even after site closure (US EPA, 2011; Ofungwu and Eget, 2005). Fires, although rare, can pose a health risk from exposure to smoke and ash (CalRecycle, 2010a; US Fire Administration, 2002). Odors and the known presence of solid waste may impair a community's perceived desirability.

Although all active solid waste sites are regulated, CalRecycle has recorded a number of old closed disposal sites and landfills that are monitored less frequently. Former abandoned disposal sites present potential for human or animal exposure to uncovered waste or burn ash. Such sites are of concern to State and local enforcement agencies (CalRecycle, 2010b).

Many of the studies that address the potential toxicity of solid waste site emissions look at the biological effects of landfill leachate on selected species of animals and plants in the laboratory. New ecological test methods have demonstrated that exposure to landfill soil containing a mixture of hazardous chemicals can cause genetic changes that are associated with adverse effects on the reproductive system (Roelofs *et al.*, 2012). In addition, an epidemiologic study of human births near landfills in Wales found an increase in the rate of birth defects after the opening or expansion of sites (Palmer *et al.*, 2005). A study conducted after an accidental fire at a municipal landfill in Greece found unacceptably high levels of dioxins in food products, primarily meat, milk and olives, from an area near the landfill (Vassiliadou *et al.*, 2009).

Method:

Closed, Illegal, and Abandoned (CIA) sites:

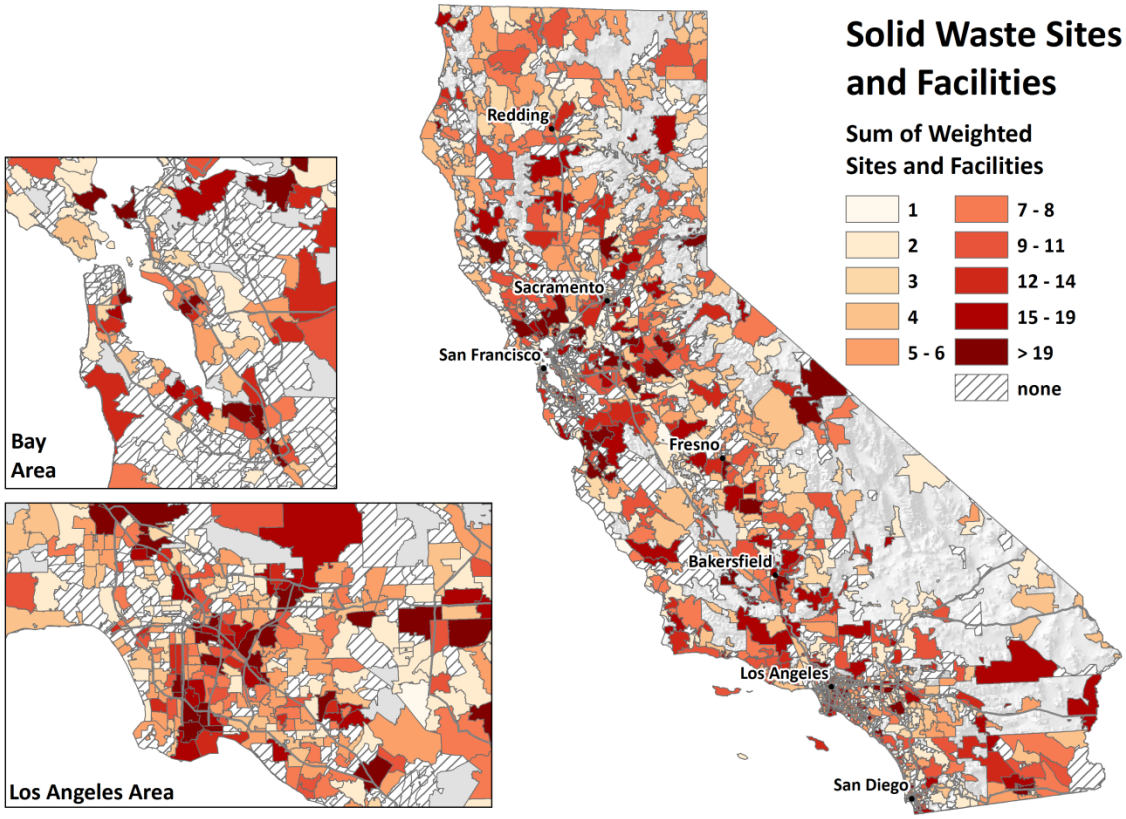
- CIA data were obtained from CalRecycle for all priorities. (Only high priority CIA sites data are available online.)
- Unconfirmed and non-solid waste sites were removed from the analysis.
- Each remaining site was scored on a weighted scale in consideration of CalRecycle's prioritization categories (see table in appendix).
- Site locations were mapped or geocoded (in ArcMap).

Active Solid Waste Information (SWIS) sites:

- SWIS data were obtained from the CalRecycle website.
- CIA records were filtered from the database because SWIS contains an inventory of both active and CIA sites.
- Of the remaining sites, Clean Closed, Absorbed, Inactive and Planned sites were not included.
- Each remaining site was scored on a weighted scale in consideration of the category type of solid waste operation (see table in appendix).
- Site locations were mapped or geocoded (in ArcMap).

All sites were assigned a 250-meter buffer and ZIP codes were scored based on the sum of weighted sites contained in their boundaries or buffers that they intersected (in ArcMap).
Solid waste facilities that scored higher than seven under the weighting matrix that did not fall within the boundaries of census ZIP codes (or within the 250 meter buffer) were assigned to the ZIP code matching the facility's postal ZIP code provided in the database.
Summed scores were assigned percentiles.

Indicator Map



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Appendix

Weighting Matrix for Solid Waste Sites and Facilities

Solid Waste Sites and Facilities from the Solid Waste Information System were weighted on a scale of 1 to a maximum of 13 in consideration of both the site type and violation history. The following table shows the weights applied to the facilities and sites. The score for any given Solid Waste Site or Facility represents the sum of its 'Site or Facility Type' and 'Violations'. For all ZIP codes, the weighted scores of all facilities in the area were summed.

Category	Criteria	Site or Facility Type	Violations (any in previous 12 months) [1]
Closed, Illegal, or Abandoned Site [1]	Priority Code [2]	**6** (Priority Code A) **4** (Priority Code B) **2** (Priority Code C) **1** (Priority Code D)	NA
Solid Waste Landfill *or* Construction, Demolition and Inert (CDI) Debris Waste Disposal (active) [3]	Tonnage	**8** (> 10,000 tpd) **7** (> 3,000 to < 10,000 tpd) **6** (> 1,000 to < 3,000 tpd) **5** (> 100 to < 1,000 tpd) **4** (< 100 tpd)	**3** (gas) **1** (each for litter, dust, noise, vectors, and site security)
Solid Waste Disposal Site (closed, closing, inactive) [4]	Tonnage	**1** (All)	**3** (gas) **1** (each for litter, vector, site security)
Inert Debris: Engineered Fill	Regulatory Tier [5]	**2** (Notification)	**1** (each for dust, noise, vectors, site security)
Inert Debris: Type A Disposal	Regulatory Tier [5]	**3** (Permitted)	**1** (each for dust, noise, vectors, site security)
Composting	Regulatory Tier [5]	**4** (Permitted) **3** (Permitted: Chipping & Grinding, 200 to ≤500 tpd) **2** (Notification)	**1** (each for vector, odor, litter, hazard, nuisance, noise, dust, site security) **1** (fire)
Transfer/Processing	Regulatory Tier [5]	**5** (Permitted: large vol.) **3** (Permitted: medium vol.; direct transfer) **2** (Notification)	**1** (each for dust, litter, vector/bird/animal, fire, site security)
Waste Tire	Regulatory Tier [5]	**4** (Major) **2** (Minor)	**2** (each for storage, fire) **1** (each for vectors, site security)

[1] Violations: Recurring requirements ensures only facilities that exhibit a pattern and practice of non-compliance receive a higher impact score and reduces point-in-time fluctuations. Explosive gas violations have a greater potential environmental impact than dust, noise, and vectors (from SWIS and the Waste Tire Management System).

[2] CIA Sites weighted per established CIA Site Priority Code scoring methodology (A through D; additional information available at http://www.calrecycle.ca.gov/SWFacilities/CIA/forms/prioritize.htm).

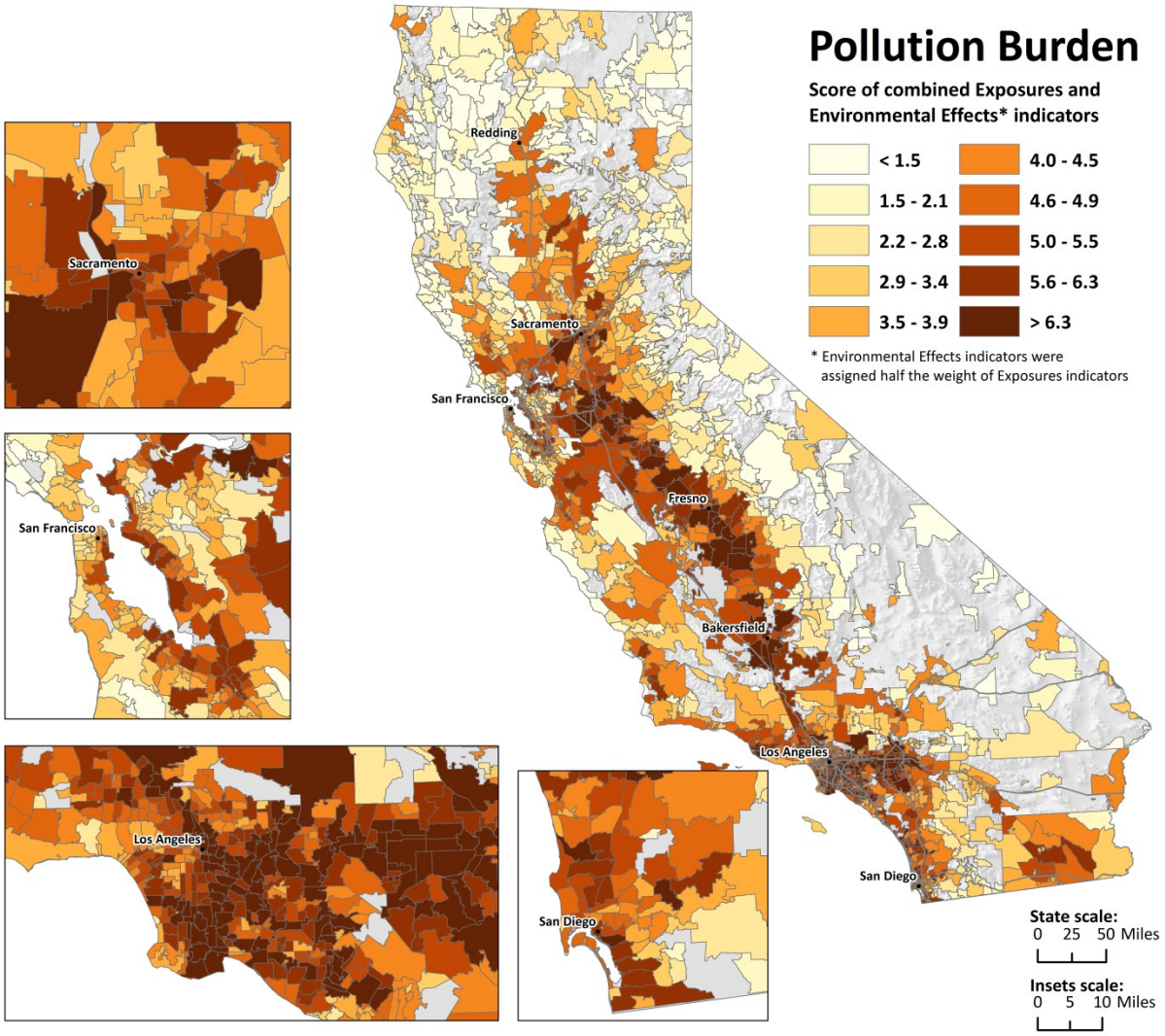
[3] Active landfills (other than Contaminated Soil Disposal Sites and Nonhazardous Ash Disposal/Monofill Facilities) are all in the Full Permit tier, so permitted tonnage (from SWIS) is used to scale impact score.

[4] Solid Waste Disposal Site (closed) means the site was closed pursuant to state closure standards that became operative in 1989. Closed sites associated with the CIA Site database were closed prior to 1989 in accordance with standards applicable at the time of closure.

[5] Regulatory Tier used to weight the site or facility. Placement within a regulatory tier accounts for the type of waste and amount of waste processed per day or onsite at any one time. See SWIS for compost and transfer/processing; Waste Tire Management System (WTMS) for waste tire sites.

SCORES FOR POLLUTION BURDEN (RANGE OF POSSIBLE SCORES: 0.1 TO 10)

Pollution Burden scores for each ZIP code are derived from the average percentiles of the six Exposures indicators (ozone and PM2.5 concentrations, diesel PM emissions, pesticide use, toxic releases from facilities, and traffic density) and the five Environmental Effects indicators (cleanup sites, impaired water bodies, groundwater threats, hazardous waste facilities and generators, and solid waste sites and facilities). Indicators from the Environmental Effects component were given half the weight of the indicators from the Exposures component. The calculated average percentile (up to 100th percentile) was divided by 10 and rounded to one decimal place for a Pollution Burden score ranging from 0.1 -10.



AGE: CHILDREN AND ELDERLY

Sensitive Populations Indicator

Children can be especially sensitive to the adverse effects of pollutants for many reasons. Children are often more susceptible to the health effects of air pollution because their immune systems and organs are still immature. Irritation or inflammation caused by air pollution is more likely to obstruct their narrow airways. Children, especially toddlers and young children, may have higher background exposures to multiple contaminants from contact with the ground, from breathing through their mouths, and from spending a significant amount of time outdoors. Further, exposure to toxic contaminants in air or other sources during infancy or childhood could affect the development of the respiratory, nervous, endocrine and immune systems, and could increase the risk of cancer later in life.

Elderly populations can also be more vulnerable to adverse health effects from exposures to pollutants than younger adults. This population is more likely to have health conditions that may worsen responses, such as weakened immune system and existing cardiovascular and respiratory disease. A history of exposure to pollutants, or interactions with medications, may influence responses.

Indicator

Percent of population under age 10 and over age 65.

Data Source

U.S. Census Bureau

As part of the 2010 decennial census, the U.S. Census Bureau questionnaire asked all census respondents for the age and date of birth of all members of the household. Datasets describing the number of individuals in different age categories are available for California at different geographic scales. The data are made available using the American FactFinder website.

http://factfinder2.census.gov/

Rationale

Sensitivity of Children

Biological differences account for children's enhanced susceptibility to environmental pollutants. Children have smaller airways, a higher oxygen demand, and lower body weight than adults. Studies have demonstrated that children under the age of two have the highest exposure to lead in soil and household dust because of hand-to-mouth behavior. Even low levels of lead in a child's blood can result in intellectual delays, attention deficit-hyperactivity disorder and behavior problems. Childhood lead poisoning is associated with poverty, recent immigrant status and lack of private health insurance (Bellinger 2004; Howarth 2012; Wright *et al.* 2008, Canfield *et al.* 2003).

Children may spend 70% of their time outdoors, where they are exposed to contaminants in outdoor air. Air pollution can contribute to asthma, aggravated by children's high breathing rates and increased particle deposition in their small airways. Because children have low

body weights and high oxygen demands, they can also ingest higher amounts of chemicals than adults in relation to their size (OEHHA, 2001).

Children have proportionately greater skin surface area than adults, allowing body heat to be lost more readily and requiring a higher rate of metabolism to maintain body temperature and fuel growth and development. The resulting higher oxygen and food requirements can lead to higher exposures to environmental contaminants in air and food (Cohen Hubal *et al.*, 2000). In addition, the skin of children, especially newborns, is softer than the skin of adults and therefore can be more readily penetrated by chemicals. Infants may have higher exposures to fat-soluble chemicals once the layer of fat underlying the skin develops at approximately 2-3 months of age, continuing through the toddler period (OEHHA, 2001). The percentage of body fat generally decreases with age (Cohen Hubal *et al.*, 2000). Once environmental chemicals have been absorbed, the infant's immature renal system is unable to eliminate them as effectively as older children and adults (Sly and Flack, 2008).

Sensitivity of the Elderly

The mechanisms of absorption, distribution, metabolism, and excretion change with age. There is a reduction in lean body mass, certain blood proteins, and total body water as we get older. In comparison to younger adult populations, there is more variation in elderly individuals' capacity to metabolize substances. Reduced metabolic rates result in decreases in blood flow, prolonging the process of chemical elimination. In addition, renal function can be reduced by 50% in the elderly (Pedersen, 1997). Heart disease, which is found in the majority of elderly populations, increases susceptibility to the effects of exposure to particulate matter and can decrease heart rate and oxygen saturation (Adler, 2003).

Researchers in Korea in the 1990s noted that an increase in air pollution resulted in an increased risk for stroke in adults over the age of 65 (Hong *et al.*, 2002). Increased prevalence of stroke has also been associated with higher concentrations of carbon monoxide, sulfur dioxide, ozone, and nitrogen oxide (Adler, 2003). A study involving senior citizens in Denver found an increased hospitalization rate for heart attacks, atherosclerosis, and pulmonary heart disease on days with high air pollution levels. Sulfur dioxide and carbon monoxide exposure have also been linked to longer hospital stays for cardiac dysrhythmias and congestive heart failure, respectively (Koken *et al.*, 2003).

Contaminants in drinking water, such as arsenic, may also pose a threat to the elderly. Arsenic accumulates in cardiovascular tissue and can trigger inflammation of the arteries, increasing the risk of atherosclerosis and vascular disease (Adler, 2003).

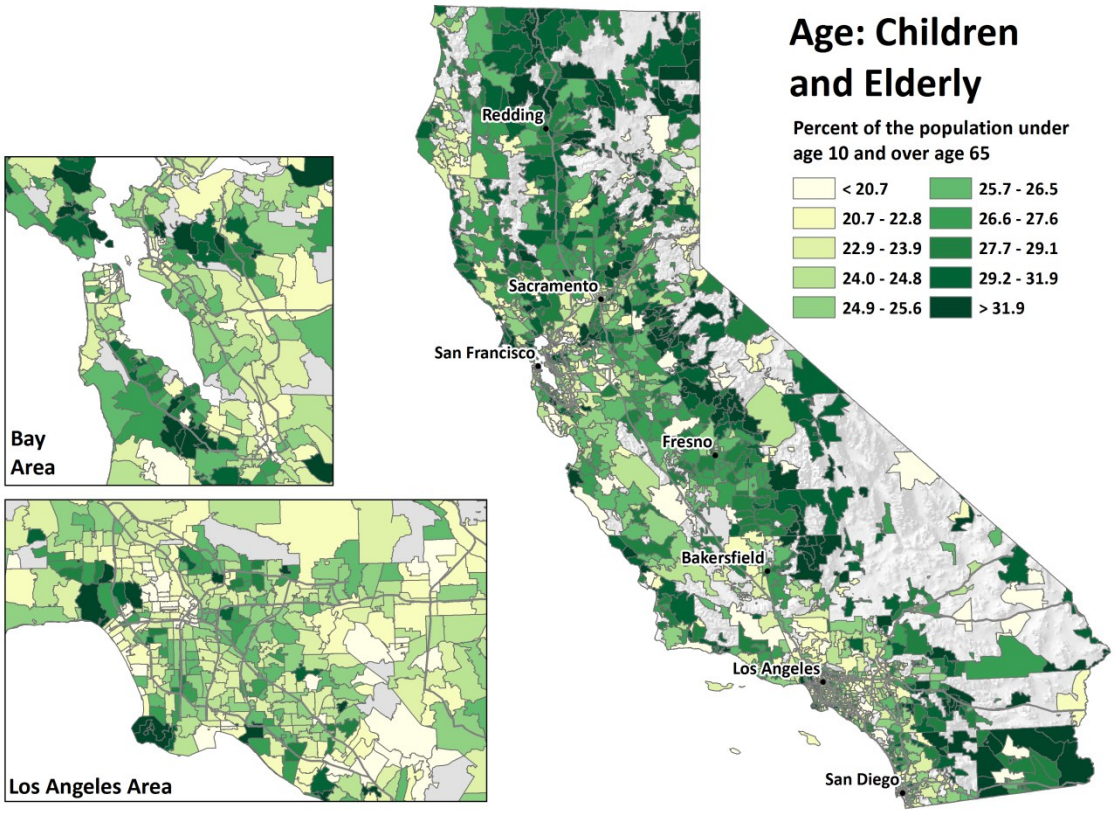
Method

- A dataset containing the number of people in different age groups by census ZIP codes was downloaded for the State.
- The percentage of children and elderly in each ZIP code was

calculated as the total number of individuals less than 10 years of age and greater than 65 years of age in the ZIP code divided by the ZIP code's total population.

- ZIP codes were ordered by this percentage. A percentile score for each ZIP code was determined by its place in the distribution of all ZIP codes.

Indicator Map



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ASTHMA

Sensitive Populations Indicator

Asthma is a chronic lung disease characterized by episodic breathlessness, wheezing, coughing, and chest tightness. While the causes of asthma are poorly understood, it is well established that exposure to traffic and outdoor air pollutants, including particulate matter, ozone, and diesel exhaust, can trigger asthma attacks. Nearly three million Californians currently have asthma and about five million have had it at some point in their lives. Children, the elderly and low-income Californians suffer disproportionately from asthma (California Health Interview Survey, 2009). Although well-controlled asthma can be managed as a chronic disease, asthma can be a life-threatening condition, and emergency department visits for asthma are a very serious outcome, both for patients and for the medical system.

Indicator

Spatially modeled, age-adjusted rate of emergency department (ED) visits for asthma per 10,000 (averaged over 2007-2009).

Data Source

California Office of Statewide Health Planning and Development (OSHPD)
California Environmental Health Tracking Program (CEHTP)
Environmental Health Investigations Branch,
California Department of Public Health

Since 2005, hospitals licensed by the state of California to provide emergency medical services are required to report all emergency department (ED) visits to OSHPD. Federally-owned facilities, including Veterans Administration and Public Health Services hospitals are not required to report. The ED dataset includes information on the principal diagnosis, which can be used to identify which patients visited the ED because of asthma.

ED utilization does not capture the full burden of asthma in a community because not everyone with asthma requires emergency care, especially if they receive preventive care, avoid asthma triggers and undertake disease maintenance. However, there is limited state-wide monitoring of other indicators, such as planned and unplanned doctor's visits, that might provide a better indication of overall disease burden. Some ED visits result in hospitalization, and OSPHD collects data on hospitalization due to asthma in addition to emergency department visits. ED visits are thought to provide a better comparative measure of asthma burden than hospitalizations and deaths because the data capture a larger portion of the overall burden and include less severe occurrences.

CEHTP used OSHPD's data to calculate age-adjusted rates of asthma ED visits for California ZIP codes. These estimates make use of ZIP-code level population estimates from a private vendor (Esri) and the U.S. 2000 Standard Population to derive age-adjusted rates. Age-adjustment takes the age distribution of a population into account and allows for meaningful comparisons between ZIP codes with different age

structures.

http://www.oshpd.ca.gov/HID/Products/EmerDeptData/
http://www.cehtp.org/p/asthma

Rationale

Asthma increases an individual's sensitivity to pollutants. Air pollutants, including particulate matter, ozone, nitrogen dioxide, and diesel exhaust, can trigger symptoms among asthmatics (Meng *et al.*, 2011). Children living near major roadways and traffic corridors in California have been shown to suffer disproportionate rates of asthma (Kim *et al.*, 2004). Particulate matter from diesel engines has been implicated as a cause of new-onset asthma (Pandya *et al*, 2002). Exposure to certain pesticides can also trigger wheezing, coughing, and chest tightness (Hernández *et al.*, 2011).

Asthma can increase susceptibility to respiratory diseases such as pneumonia and influenza (Kloepfer *et al.*, 2012). For example, one study found that when ambient particulate pollution levels are high, persons with asthma have twice the risk of being hospitalized for pneumonia compared to persons without asthma (Zanobetti *et al.*, 2000).

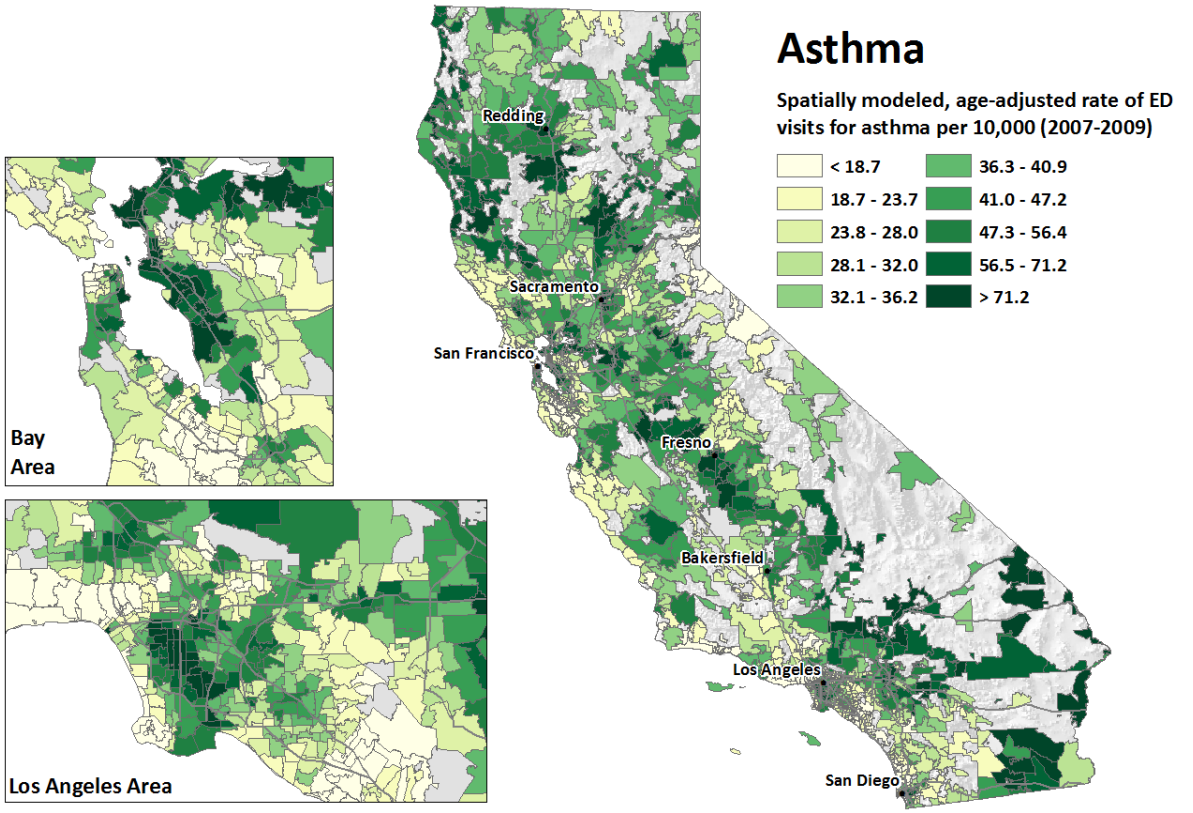
Asthma rates are a good indicator of population sensitivity to environmental stressors because asthma is both caused by and worsened by pollutants (CDPH, 2010). The severity of symptoms and the likelihood of needing hospital care decrease with access to regular medical care and asthma medication (Delfino *et al.*, 1998; Grineski *et al.*, 2010). Asthma-related emergency department visits provide a conservative estimate of total asthma cases because not all cases require emergency care. However, using those cases requiring emergency care as an indicator also captures some aspects of access to care and can be seen as a marker of both environmental and social stressors. Potential biases in using emergency department visits as an indicator of sensitivity include the possibility that lower socioeconomic status or more isolated rural populations may not have access to nearby health care facilities. Conversely, populations without health insurance may turn to emergency departments for care.

Method

- An age-adjusted rate of asthma emergency department (ED) visits was calculated for each ZIP code by CEHTP using data obtained from OSHPD.
- CEHTP obtained records for ED visits occurring during 2007-2009 from OSHPD's Emergency Department and Ambulatory Surgery files if the patient was listed as residing in California and principle diagnostic ICD-9-CM code began with the digits 493 (asthma).
- Population data used for the age-adjustment were obtained from Esri and rates reported are standardized to the 2000 U.S. population using five-year age groupings (0-4, 5-9, etc.). The rates are per 10,000 residents per year.
- The age-adjusted rates of asthma ED visits per 10,000 residents by ZIP code were then spatially modeled to provide estimates for ZIP codes with fewer than 12 ED visits and to incorporate information

about local and statewide averages into the calculations.
- A Bayesian modeling technique was used to calculate the spatially modeled rates (Mollié, 1996).
- ZIP codes without a spatially modeled rate are census ZIP codes that did not correspond to Esri ZIP codes used in the age-adjustment.
- ZIP codes were ordered by the spatially modeled rate and were assigned percentiles based on the distribution across all ZIP codes.

Indicator Map



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LOW BIRTH WEIGHT INFANTS

Sensitive Populations Indicator

Infants born weighing less than 2,500 grams (about 5.5 pounds) are classified as low birth weight (LBW), a condition that is associated with increased risk of later health problems as well as infant mortality. Most LBW infants are small because they were born early. Infants born at full term (after 37 complete weeks of pregnancy) can also be LBW if their growth was impaired during pregnancy. Nutritional status, lack of prenatal care, stress, and maternal smoking are known risk factors for LBW. Studies also suggest links with environmental exposures to lead, air pollution, toxic air contaminants, traffic pollution, pesticides, and polychlorinated biphenyls (PCBs). These children are at risk for numerous chronic health conditions and may be more sensitive to environmental exposures after birth.

Indicator

Percent low birth weight (averaged over 2007-2011).

Data Source

California Department of Public Health (CDPH)

The Health Information and Research Section of CDPH is responsible for the stewardship and distribution of birth records in the state. Medical data related to a birth, as well as demographic information related to the infant, mother, and father is collected from birth certificates. The residential ZIP code reported by the mother is also included. Birth profiles for California ZIP codes and counties can be accessed by the general public from the CDPH website. Personal identifiers are not released publicly to protect confidentiality.

http://www.cdph.ca.gov/data/statistics/Pages/BirthProfilesbyZIPCode.aspx
http://www.cdph.ca.gov/data/statistics/Pages/CountyBirthStatisticalDataTables.aspx

Rationale

LBW is considered a key marker of overall population health. Being born low weight puts individuals at higher risk of health conditions that can subsequently make them more sensitive to environmental exposures. For example, children born low weight are at increased risk of developing asthma (Nepomnyaschy and Reichman, 2006). Asthma symptoms, in turn, are worsened by exposure to air pollution. LBW can also put one at increased risk of coronary heart disease and type 2 diabetes (Barker *et al.*, 2002). These conditions can predispose one to mortality associated with particulate air pollution or excessive heat (Bateson and Schwartz, 2004; Basu and Samet, 2002). There is also evidence that children born early have lowered cognitive development and more behavioral problems compared to children born at term (Butta *et al.*, 2002), putting them at disadvantage for subsequent opportunities for good health.

Risk of LBW is increased by certain environmental exposures and social factors and can therefore be considered a marker of the combined

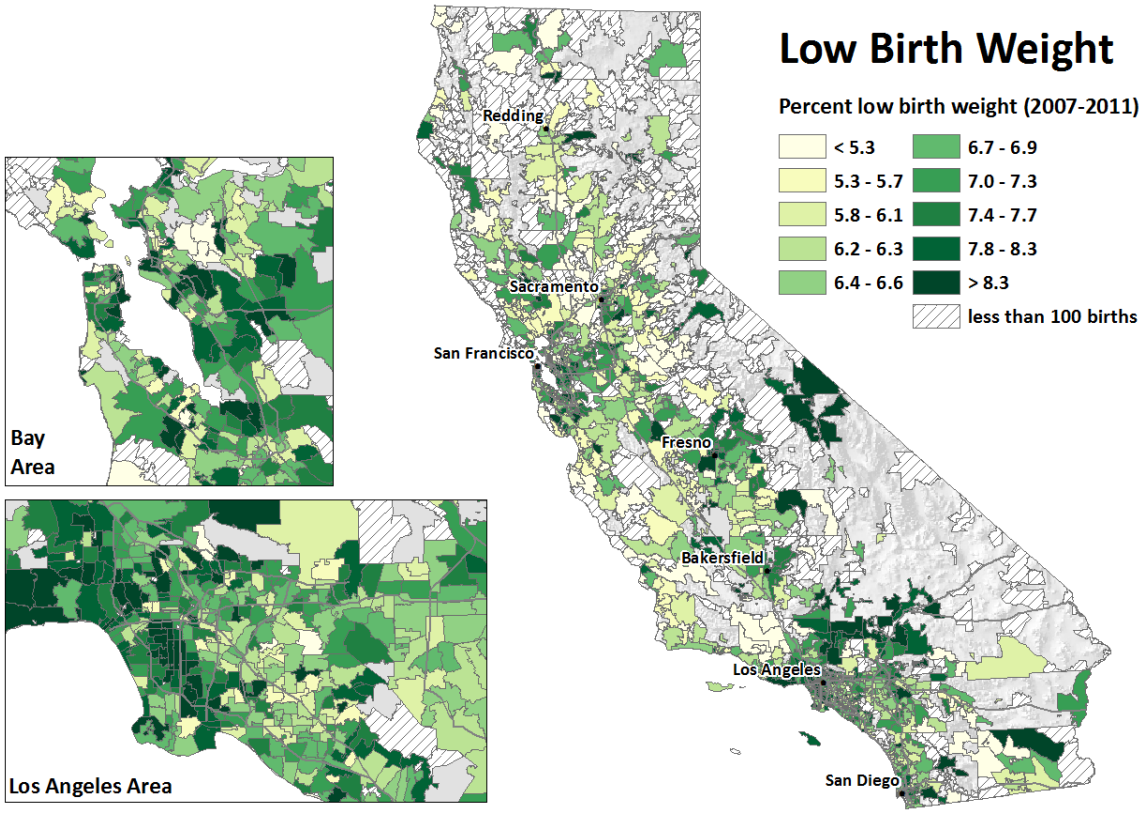
impact of environmental and social stressors. For example, exposures to traffic and to toxic air contaminants such as benzene, xylene, and toluene have been linked to LBW in California (Ghosh *et al.*, 2012). Low weight births are more common among African-American women than they are among Hispanic and non-Hispanic white women, even among those with comparable socioeconomic status, prenatal care, and behavioral risk factors (Lu and Halfon, 2003).

Living in close proximity to freeways has been associated with an increased risk for low birth weight term infants (Laurent *et al.*, 2013). Latina women exposed to pesticides in California in low-income farmworker communities were found to be at risk for low birth weight infants that were small for gestational age, with smaller than average head circumference, an indicator of brain development. (Harley *et al.*, 2011).

Method

- The average low birth weight (LBW) rate was defined as the percent of live births (including multiple births) weighing less than 2,500 grams occurring in one year.
- Estimates derived from places with few births are considered unreliable because they vary greatly from year to year. For this reason, ZIP codes with less than 100 live births during the time period considered were excluded. The average was estimated using five years of data (2007-2011) in order to minimize the number of ZIP codes that had to be excluded. It was assumed that the ZIP code geographic boundaries did not change during these five years.
- Reported ZIP codes were assigned the rate of their corresponding census ZIP code, assuming perfect geographic overlap. Reported ZIP codes that did not correspond to a census ZIP code were excluded from the analysis.
- ZIP codes that had less than 100 live births over the five years or did not correspond to a census ZIP code were excluded from the calculation of percentiles for all other ZIP codes.

Indicator Map



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EDUCATIONAL ATTAINMENT

Socioeconomic Factors Indicator

Educational attainment is an important element of socioeconomic status and a social determinant of health. Numerous studies suggest education can have a protective effect from exposure to environmental pollutants that damage health. Information on educational attainment is collected annually in the U.S. Census Bureau's American Community Survey (ACS). In contrast to the decennial census, the ACS surveys a small sample of the U.S. population to estimate more detailed economic and social information for the country's population.

Indicator

Percent of the population over age 25 with less than a high school education (5-year estimate, 2007-2011).

Data Source

American Community Survey
U.S. Census Bureau

The American Community Survey (ACS) is an ongoing survey of the U.S. population conducted by the U.S. Census Bureau and has replaced the long form of the decennial census. Unlike the decennial census, which attempts to survey the entire population and collects a limited amount of information, the ACS releases results annually based on a sub-sample of the population and includes more detailed information on socioeconomic factors such as educational attainment. Multiple years of data are pooled together to provide more reliable estimates for geographic areas with small population sizes. The most recent results available at the census ZIP code are the 5-year estimates for 2007-2011. The data are made available using the American FactFinder website.

http://www.census.gov/acs/www/
http://factfinder2.census.gov/

Rationale

Educational attainment is an important independent predictor of health (Cutler and Lleras-Muney, 2006). As a component of socioeconomic status, education is often inversely related to the degree of exposure to indoor and outdoor pollution. Several studies have associated educational attainment with susceptibility to the health impacts of environmental pollutants. For example, individuals without a high school education appear to be at higher risk of mortality associated with particulate air pollution than those with a high school education (Krewski *et al.*, 2000). There is also evidence that the effects of air and traffic-related pollution on respiratory illness, including childhood asthma, are more severe in communities with lower levels of education (Cakmak *et al.*, 2006; Shankardass *et al.*, 2009; Neidell, 2004).

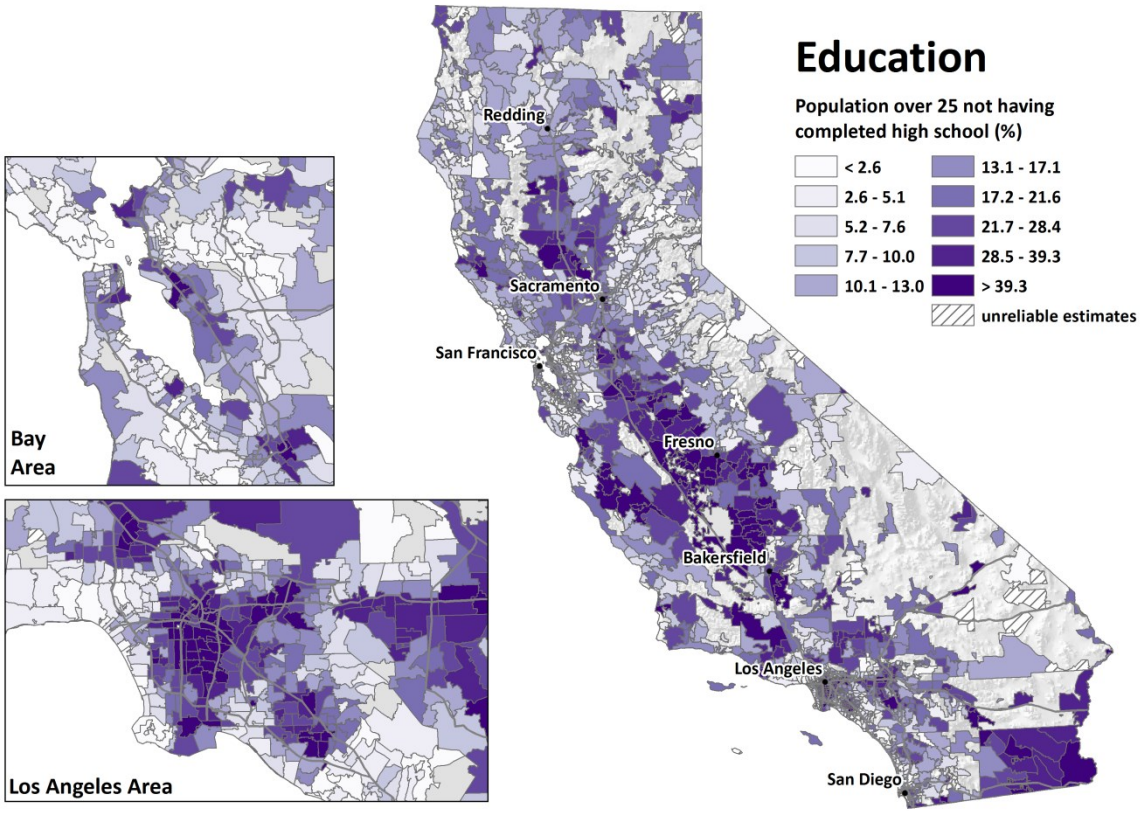
The ways in which lower educational attainment can decrease health status are not completely understood, but may include economic hardship, stress, fewer occupational opportunities, lack of social support, and reduced access to health-protective resources such as medical care, prevention and wellness initiatives, and nutritious food. In a study of pregnant women in Amsterdam, smoking and exposure to environmental

tobacco smoke were more common among women with less education. These women also were at significantly increased risk of preterm birth, low birth weight and small for gestational age infants (van den Berg *et al.*, 2012). A review of studies tying social stressors with the effects of chemical exposures on health found that level of education was related to mortality and incidence of asthma and respiratory diseases from exposure to particulate air pollution and sulfur dioxide (Lewis *et al.*, 2011).

Method

- From the 2007-2011 American Community Survey estimates, a dataset containing the percentage of the population over age 25 with a high school education or higher was downloaded by census ZIP codes for the state of California.
- This percentage was subtracted from 100 to obtain the proportion of the population with less than a high school education by census ZIP code.
- Due to small sampling size or small population size within a ZIP code, not all estimates of the educational attainment are reliable. The margin of error (MOE) reported in the ACS was used to evaluate the reliability estimates. The MOE is the difference between an estimate and its upper or lower confidence bound. All ACS-published margins of error are based on a 90 percent confidence level.
- All ZIP codes in which the ratio of the MOE to the estimate was less than 66.6 percent (two-thirds) were retained. Of the remaining estimates, the MOE was larger than 20.6, which corresponds to the 33.3 percentile (tertile) of all-percent high school education estimates. These estimates were also removed.
- ZIP codes meeting this criteria were ordered by percent of population over age 25 with less than a high school education and percentiles were assigned to each based on the distribution across all ZIP codes.

Indicator Map



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LINGUISTIC ISOLATION

Socioeconomic Factors Indicator

According to the most recent U.S. Census Bureau's 2007-2011 American Community Survey (ACS), nearly 43% of Californians speak a language at home other than English, about 20% of the state's population speaks English "not well" or "not at all," and 10% of all households in California are linguistically isolated. The U.S. Census Bureau uses the term "linguistic isolation" to measure households where all members 14 years of age or above have at least some difficulty speaking English. A high degree of linguistic isolation among members of a community raises concerns about access to health information and public services, and effective engagement with regulatory processes. Information on language use is collected annually in the ACS. In contrast to the decennial census, the ACS surveys a small sample of the U.S. population to estimate more detailed economic and social information for the country's population.

Indicator

Percentage of households in which no one age 14 and over speaks English "very well" or speaks English only.

Data Source

American Community Survey
U.S. Census Bureau

The American Community Survey (ACS) is an ongoing survey of the U.S. population conducted by the U.S. Census Bureau and has replaced the long form of the decennial census. Unlike the decennial census, which attempts to survey the entire population and collects a limited amount of information, the ACS releases results annually based on a sub-sample of the population and includes more detailed information on socioeconomic factors such as linguistic isolation. Multiple years of data are pooled together to provide more reliable estimates for geographic areas with small population sizes. The most recent results available at the census ZIP code are the 5-year estimates for 2007-2011. The data are made available using the American FactFinder website.

http://www.census.gov/acs/www/
http://factfinder2.census.gov/

Rationale

From 1990 to 2000 the number of households in the U.S. defined as "linguistically isolated" rose by almost 50% (Shin and Bruno, 2003). While the percentage of immigrant households in California that are linguistically isolated is comparable to the national percentage, according to the 2009 American Community Survey (Hill, 2011), California has a higher proportion of immigrants than any other state and the immigrant population has increased by 400% since 1970 (Johnson, 2011). The inability to speak English well can affect an individual's communication with service providers and his or her ability to perform daily activities. People with limited English are less likely to have regular medical care and are more likely to report difficulty getting medical information or advice than English speakers. Communication is essential for many steps in the process of obtaining health care, and limited English speakers may delay care because they

lack important information about symptoms and available services (Shi *et al*. 2009). Non-English speakers are also less likely to receive mental health services when needed, and because in California non-English speakers are concentrated in minority ethnic communities, limited English proficiency may contribute to further ethnic and racial disparities in health status and disability (Sentell *et al*. 2007). Linguistic isolation is also an indicator of a community's ability to participate in decision-making processes and the ability to navigate the political system.

Lack of proficiency in English often results in racial discrimination, and both language difficulties and discrimination are associated with stress, low socioeconomic status and reduced quality of life (Gee and Ponce, 2010). Linguistic isolation hampers the ability of the public health sector to reduce racial and ethnic disparities because non-English-speaking individuals participate in public health surveillance studies at very low rates, even when there is translation available (Link *et al*., 2006).

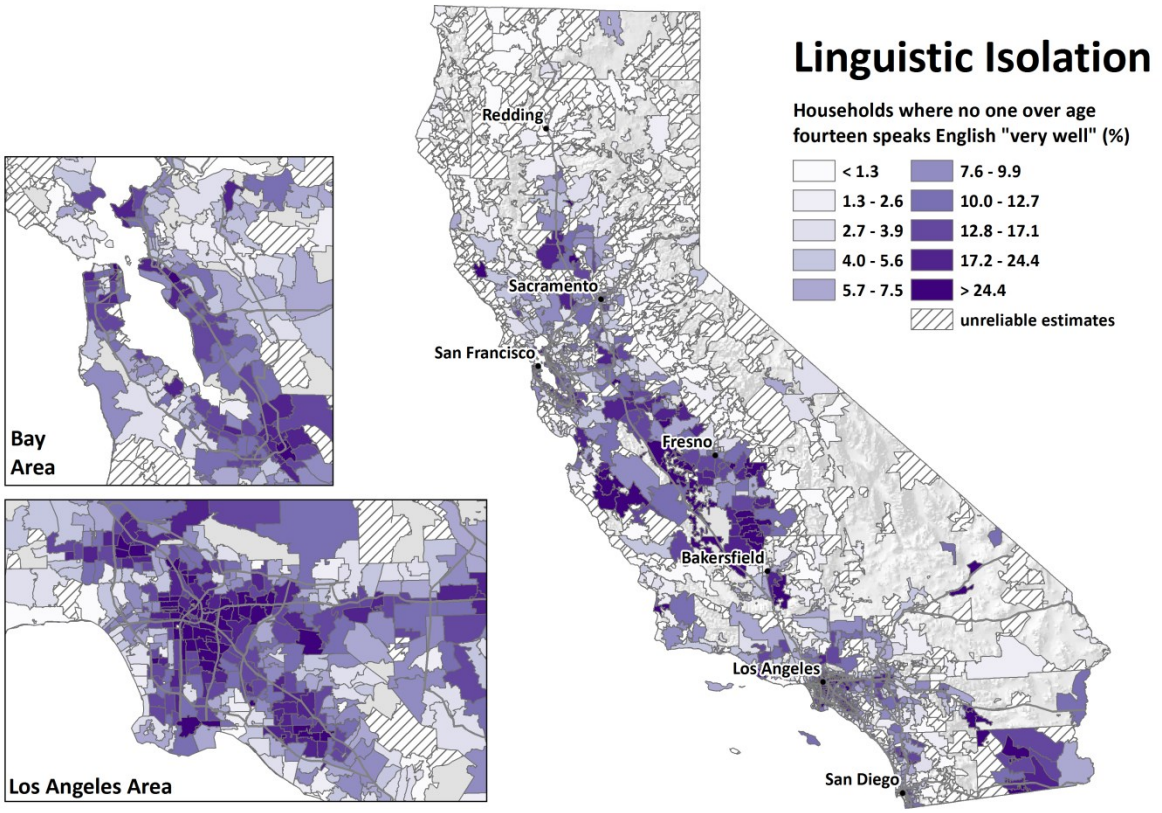
In the event of an emergency, such as an accidental chemical release or a spill, households that are linguistically isolated may not receive timely information on evacuation or shelter-in-place orders, and may therefore experience health risks that those who speak English can more easily avoid. Additionally, linguistic isolation was independently related to both proximity to a Toxic Release Inventory (TRI) facility and cancer risks by the National-Scale Air Toxics Assessment (NATA) in an analysis of the San Francisco Bay Area, suggesting that linguistically isolated communities may bear a greater share of health risks from air pollution hazards (Pastor *et al*,. 2010).

Method

- From the 2007-2011 American Community Survey, a dataset containing the average percent of household in which no one age 14 and over speaks English "very well" or speaks English only was downloaded by census ZIP codes for the state of California. This variable is referred to as "linguistic isolation" and measures households where no one speaks English well.
- Due to small sampling size or small population size within a ZIP code, not all estimates are reliable. The margin of error (MOE) reported in the ACS was used to evaluate the reliability of each estimate. The margin of error is the difference between an estimate and its upper or lower confidence bound. All ACS-published margins of error are based on a 90 percent confidence level. The following criteria were used:
  - All estimates where the ratio of the MOE to the estimate was less than 66.6 percent (two-thirds) were included.
  - The distribution of all the ZIP codes was considered. The 33.3 percentile (lower tertile) was 4.2% and the 66.6 percentile (upper tertile) was 11.2%.
  - For estimates below 4.2%, if the upper bound was greater or equal to 4.2%, then the estimate was retained.
  - For estimates between 4.3% and 11.2%, if the lower bound was greater than 4.3% and the upper bound was less than 11.2%,

then the estimate was retained.
    - For estimates greater than 11.3%, if the lower bound was greater than 4.3%, then the estimate was retained.
- ZIP codes meeting this criteria were ordered by the percent linguistically isolated and percentiles were assigned to each based on the distribution across all ZIP codes.

Indicator Map



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POVERTY

Socioeconomic Factors Indicator

Poverty is an important social determinant of health. Numerous studies have suggested that impoverished populations are more likely than wealthier populations to experience adverse health outcomes when exposed to environmental pollution. Information on poverty is collected annually in the U.S. Census Bureau's American Community Survey (ACS). In contrast to the decennial census, the ACS surveys a small sample of the U.S. population to estimate more detailed economic and social information for the country's population.

Indicator

Percent of the population living below two times the federal poverty level (5-year estimate, 2007-2011).

Data Source

American Community Survey
U.S. Census Bureau

The American Community Survey (ACS) is an ongoing survey of the U.S. population conducted by the U.S. Census Bureau and has replaced the long form of the decennial census. Unlike the decennial census, which attempts to survey the entire population and collects a limited amount of information, the ACS releases results annually based on a sub-sample of the population and includes more detailed information on socioeconomic factors such as poverty. Multiple years of data are pooled together to provide more reliable estimates for geographic areas with small population sizes. The most recent results available at the census ZIP code are the 5-year estimates for 2007-2011. The data are made available using the American FactFinder website.

The Census Bureau uses income thresholds that are dependent on family size to determine a person's poverty status during the previous year. For example, if a family of four with two children has a total income less than $21,938 during 2010, everyone in that family is considered to live below the federal poverty line. A threshold of twice the federal poverty level was used in this analysis because the federal poverty thresholds have not changed since the 1980s despite increases in the cost of living, and because California's cost of living is higher than many other parts of the country.

http://www.census.gov/acs/www/
http://factfinder2.census.gov/

Rationale

Wealth influences health because it helps determine one's living conditions, nutrition, occupation, and access to health care and other health-promoting resources. For example, studies have shown a stronger effect of air pollution on mortality (Forastiere *et al.*, 2007) and childhood asthma (Lin *et al.*, 2004, Meng *et al.*, 2011) among low income communities. A multi-city study in Canada found that the effect of nitrogen dioxide on respiratory hospitalizations was increased among lower income households compared to those with higher incomes (Cakmak *et al.*, 2006). Other studies have found that neighborhood-level

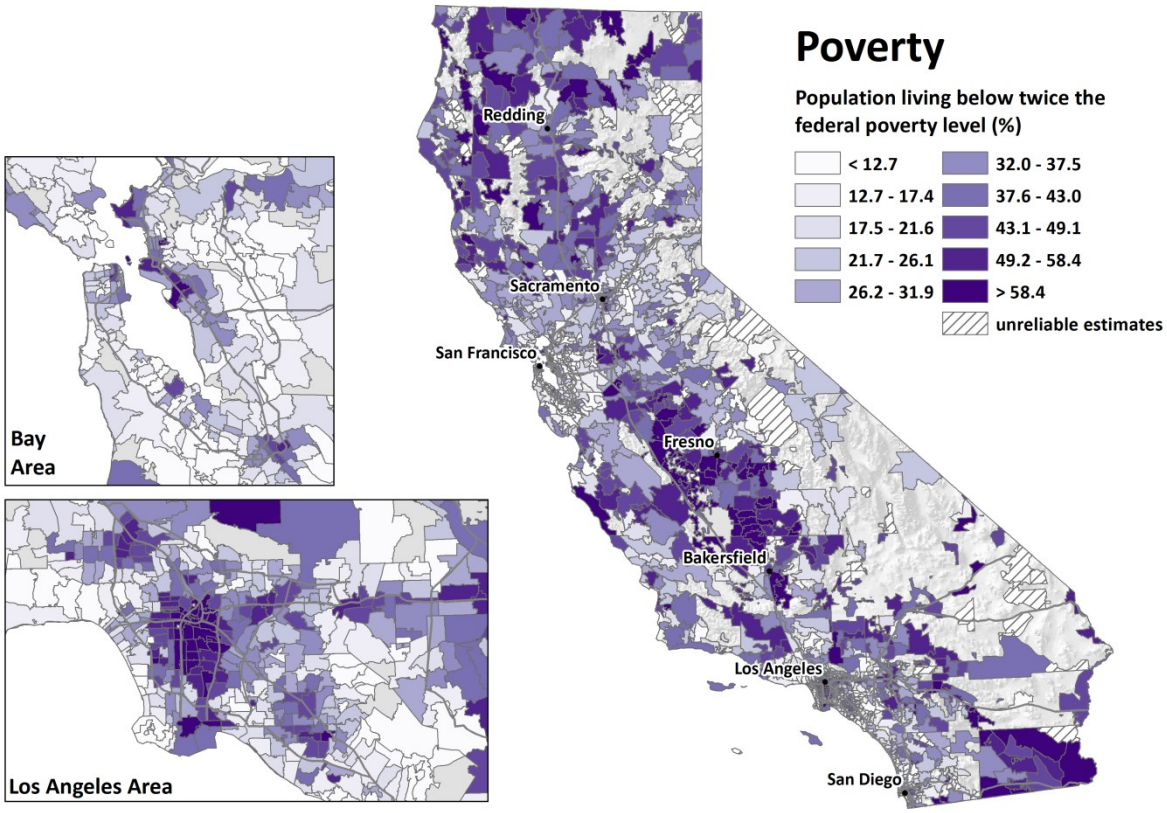
income modifies the relationship between particulate air pollution and preterm birth (Yi *et al.,* 2010) as well as traffic and low birth weight (Zeka *et al.,* 2008), with mothers living in low income neighborhoods having higher risk of both outcomes.

One way by which poverty may lead to greater susceptibility is from the effects of chronic stress on the body (Wright *et al.*, 1999; Brunner and Marmot, 2006). Differential underlying burdens of pre-existing illness and co-exposure to multiple pollutants are other possible factors (O'Neill *et al.,* 2003).

Method

- From the 2007-2011 American Community Survey, a dataset containing the number of individuals below 200 percent of the federal poverty level was downloaded by census ZIP codes for the state of California.
- The number of individuals below the poverty level was divided by the total population for whom poverty status was determined to obtain a percent.
- The margin of error (MOE) reported in the ACS was used to evaluate the reliability of each estimate. Due to small sampling size or small population size within a ZIP code, not all estimates are reliable. The MOE is the difference between an estimate and its upper or lower confidence bound. All ACS-published margins of error are based on a 90 percent confidence level.
- MOEs are reported on the total population (for whom poverty status was determined). The MOE was used to evaluate the reliability of each estimate. If the ratio of MOE) to the total population was greater 66.6 percent (two-thirds), the estimate was excluded.
- ZIP codes meeting this criteria were ordered by the percentage of the population below twice (or 200 percent of) the federal poverty level. A percentile score for a ZIP code was determined by its place in the distribution of all ZIP codes.

Indicator Map



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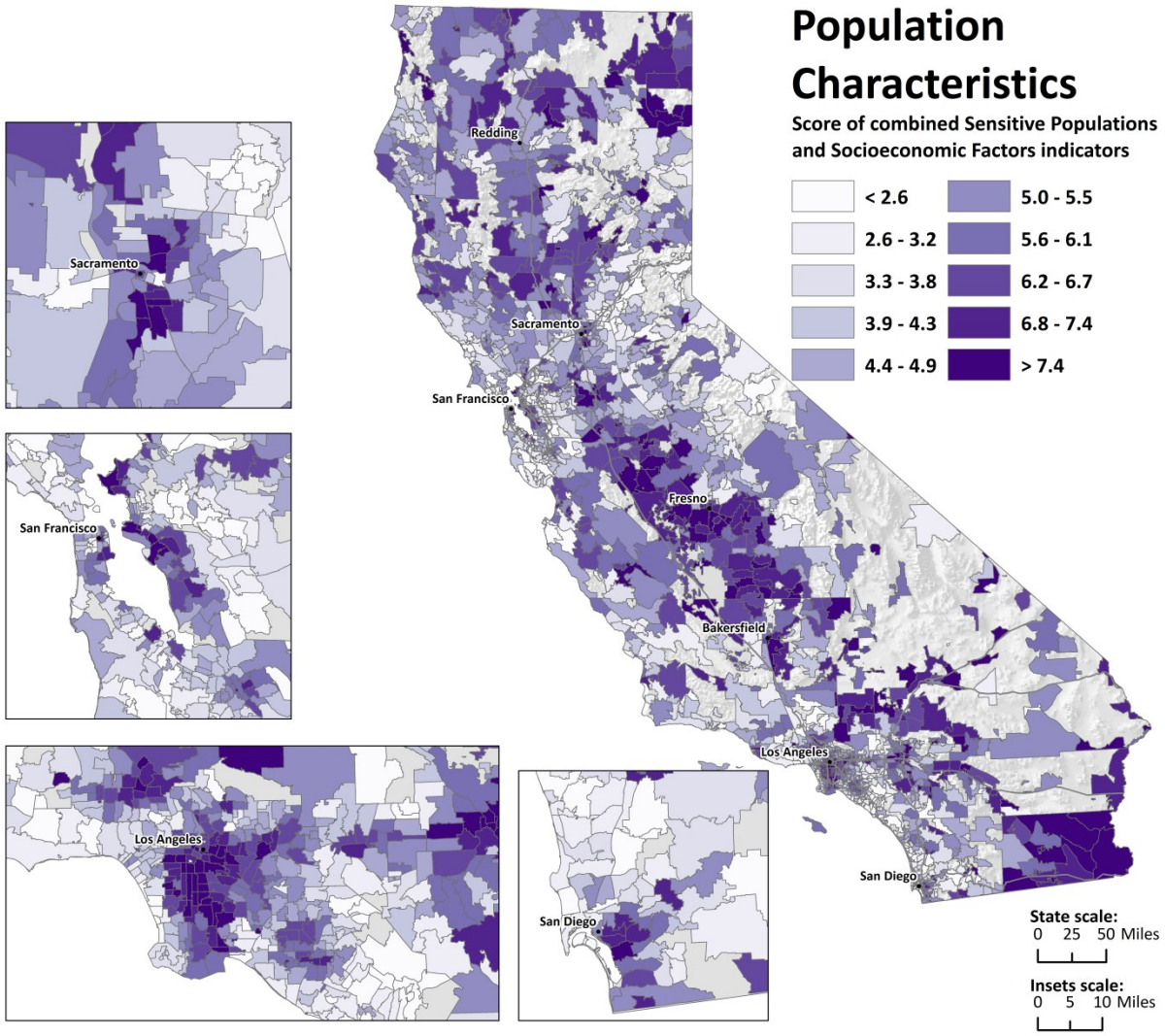
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SCORES FOR POPULATION CHARACTERISTICS (RANGE OF POSSIBLE SCORES: 0.1 TO 10)

Population Characteristics scores for each ZIP code are derived from the average percentiles for the three Sensitive Populations indicators (children/elderly, low birth weight, and asthma) and the three Socioeconomic Factors indicators (educational attainment, linguistic isolation, and poverty). The calculated average percentile divided by 10 for a Population Characteristic score ranging from 0.1 -10.

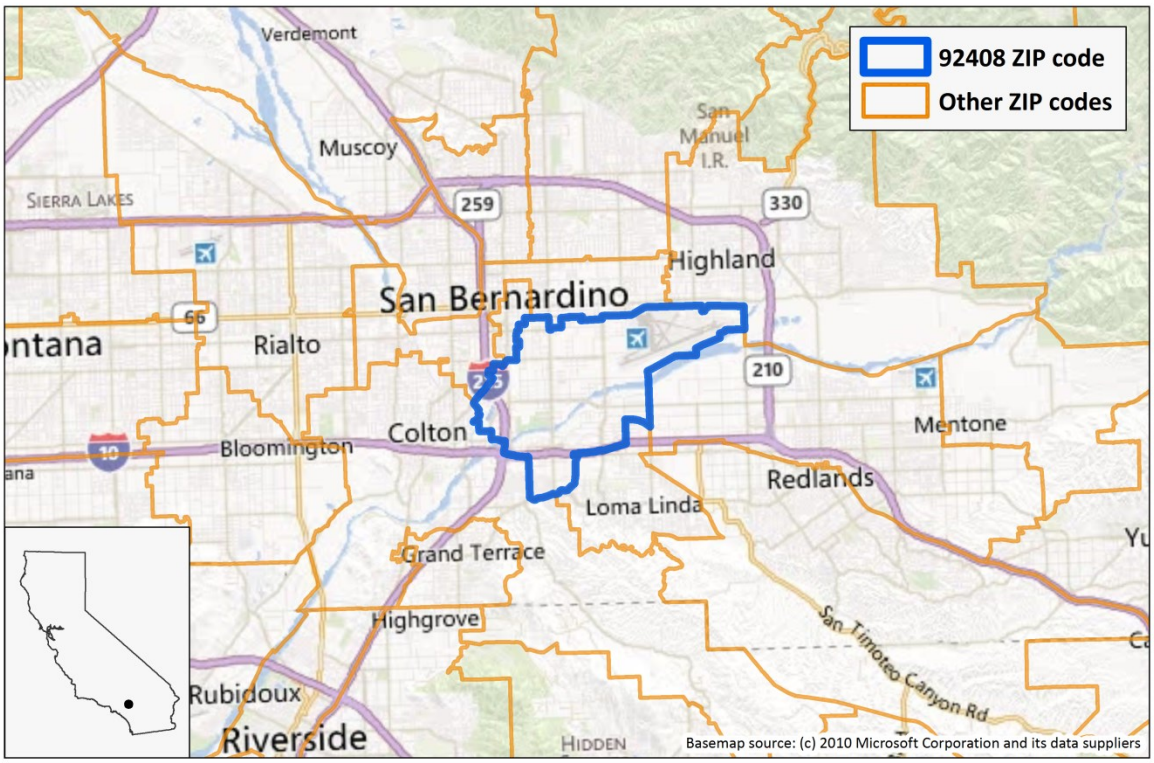


EXAMPLE ZIP CODE:
INDICATOR RESULTS AND CALENVIROSCREEN SCORE

EXAMPLE: 92408, SAN BERNARDINO POPULATION 15,271

One example ZIP code was selected to illustrate how an overall CalEnviroScreen score is calculated using the California Communities Environmental Health Screening Tool. Shown below are:

- An area map for the ZIP code and surrounding ZIP codes.
- Tables for the indicators of Pollution Burden and Population Characteristics with percentile scores for each of the indicators.
- A table showing how a CalEnviroScreen score would be calculated for the example area, based on the data in this report.



Exposure Indicators						
Indicator	**Ozone** (concentration)	**PM2.5** (concentration)	**DieselPM** (emissions)	**Pesticide Use** (lbs/sq. mi.)	**Toxic Releases** (weighted lbs)	**Traffic** (density)
Raw Value	0.81	14.0	22.65	0.35	576964	1,725
Percentile	98.26	83.28	84.68	29.88	78.50	80.92

Environmental Effects Indicators					
Indicator	**Cleanup Sites** (weighted sites)	**Groundwater Threats** (weighted sites)	**Hazardous Waste Facilities/ Generators** (weighted sites)	**Impaired Water Bodies** (number of pollutants)	**Solid Waste Sites/Facilities** (weighted sites and facilities)
Raw Value	91	110	5.95	1	24
Percentile	90.75	75.09	88.87	14.50	97.41

Sensitive Population Indicators			
Indicator	**Children (<10) and Elderly (>65)** (percent)	**Asthma** (rate per 10,000)	**Low Birth Weight** (percent)
Raw Value	23.2	73.26	8.11
Percentile	22.74	90.65	87.68

Socioeconomic Factor Indicators			
Indicator	**Educational Attainment** (percent)	**Linguistic Isolation** (percent)	**Poverty** (percent)
Raw Value	31.5	18.5	55.4
Percentile	83.51	83.36	87.22

CALCULATION OF CALENVIROSCREEN SCORE FOR 92408

	Pollution Burden		Population Characteristics	
	Exposures *(6 indicators)*	**Environmental Effects*** *(5 indicators)*	**Sensitive Populations** *(3 indicators)*	**Socioeconomic Factors** *(3 indicators)*
Indicator Percentiles	98.26 +83.28 +84.68 +29.88 +78.50 +80.92	+ (0.5 × 90.75) + (0.5 × 75.09) + (0.5 × 88.87) + (0.5 × 14.50) + (0.5 × 97.41)	22.74 + 90.65 + 87.68	+ 83.51 + 83.36 + 87.22
Average Percentile	638.83 ÷ (6 + (0.5 × 5)) = 75.16		455.16 ÷ 6 = 75.86	
Score (Range 0.1 – 10)	7.5		7.6	
CalEnviroScreen Score	7.5 x 7.6 = 57 (57 is in the top 5% of CalEnviroScreen ZIP codes statewide)			

* Indicators from the Environmental Effects component were given half the weight of the indicators from the Exposures component

CALENVIROSCREEN TOP 10% AND STATEWIDE RESULTS

The maps on the following pages depict the top 10 percent of statewide ZIP codes using the CalEnviroScreen methodology described in this report. The first set of maps depicts the top 5 and 10 percent scoring ZIP Codes in the state.

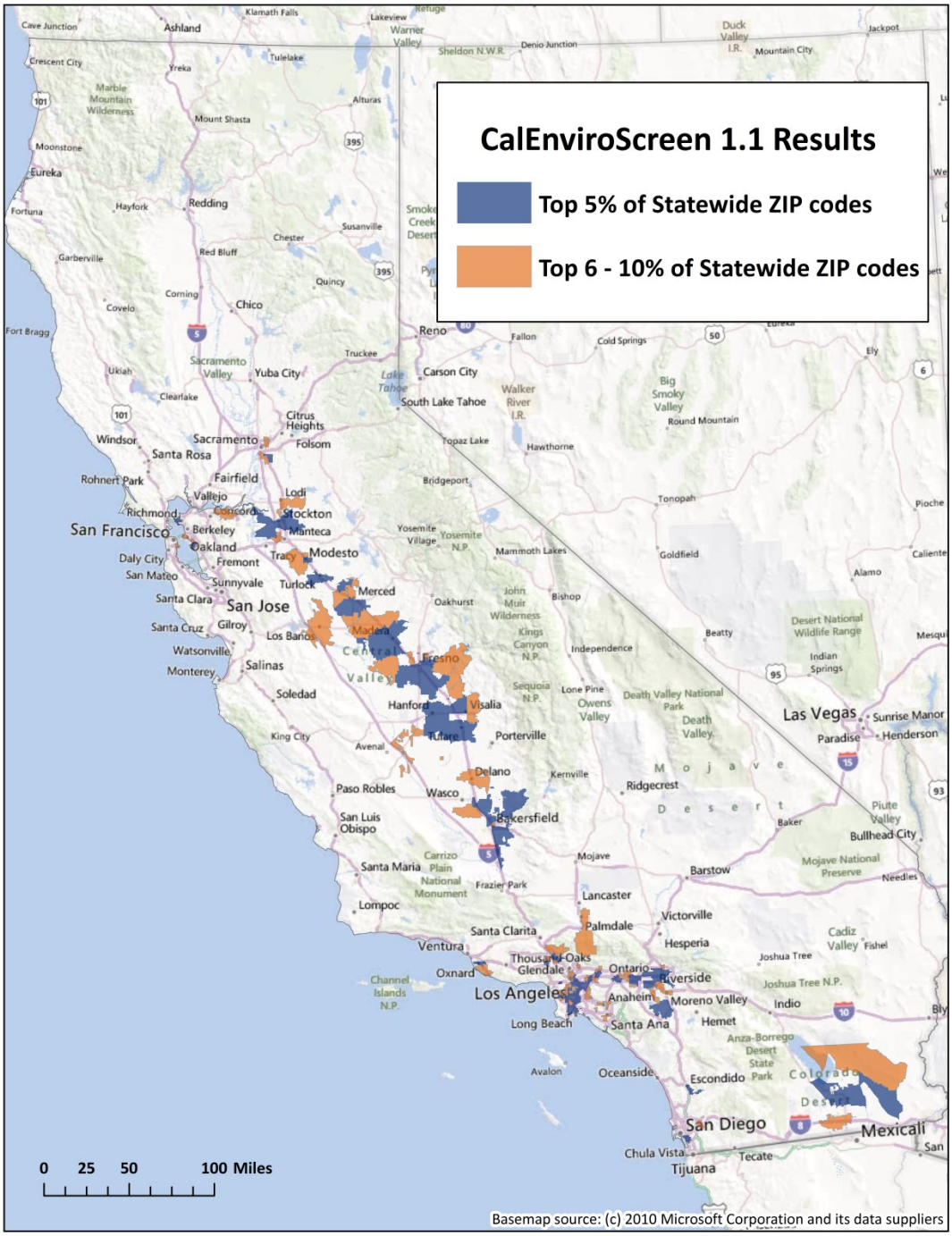
The second set of maps depicts the relative scoring of California's census ZIP codes. ZIP codes with darker colors have the higher CalEnviroScreen scores and therefore have relatively high pollution burdens and population sensitivities. ZIP codes with lighter colors have lower scores, and correspondingly lower pollution burdens and sensitivities.

The maps of specific regions of the state (Los Angeles, San Francisco, San Diego, San Joaquin Valley, Sacramento and the Coachella and Imperial Region) are "close-ups" of the statewide map and are intended to provide greater clarity on the relative scoring of census ZIP codes in those regions. Colors on these maps reflect the relative statewide scoring of individual ZIP codes.

Numerical scores for each ZIP code, as well as the individual indicator scores for each ZIP code, may be found online at OEHHA's web site at (http://www.oehha.ca.gov/ej/). The information is available both in a Microsoft Excel spreadsheet format, and will be available as an online mapping application.

TOP 10% HIGHEST SCORING CENSUS ZIP CODES

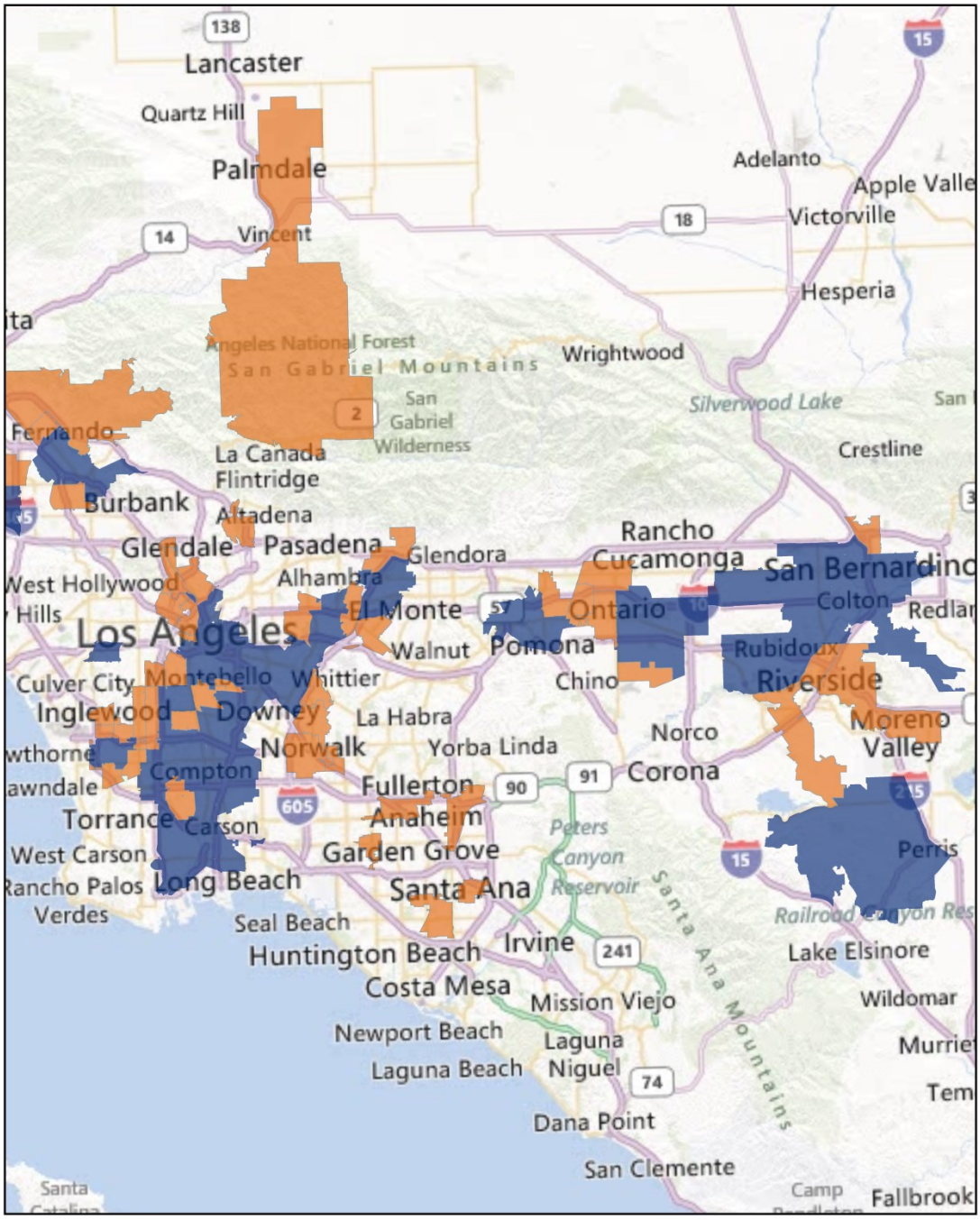
Using the CalEnviroScreen scores for all the census ZIP codes across the State, the 10% of the ZIP codes with the highest scores were identified. This represents 176 of the 1769 ZIP codes in the State. Because of variation in the number of people living in different ZIP codes, the population represented in these 10% of ZIP codes is about 7.8 million, or about 21% of the 37 million people living in California.



CalEnviroScreen 1.1 Results

Top 5% of Statewide ZIP codes

Top 6 - 10% of Statewide ZIP codes



Los Angeles Area

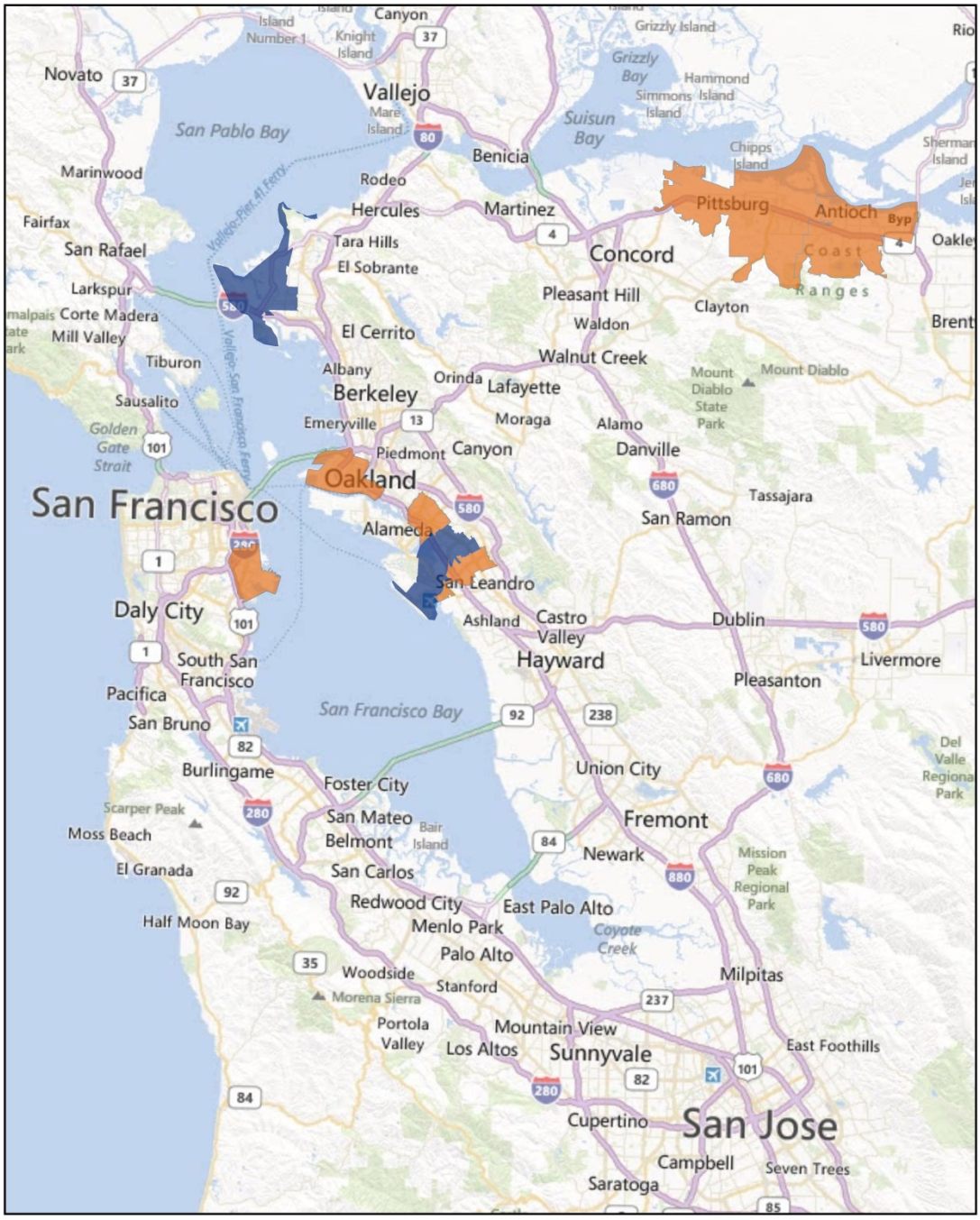
0 5 10 20 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

Top 5% of Statewide ZIP codes

Top 6 - 10% of Statewide ZIP codes



San Francisco Area

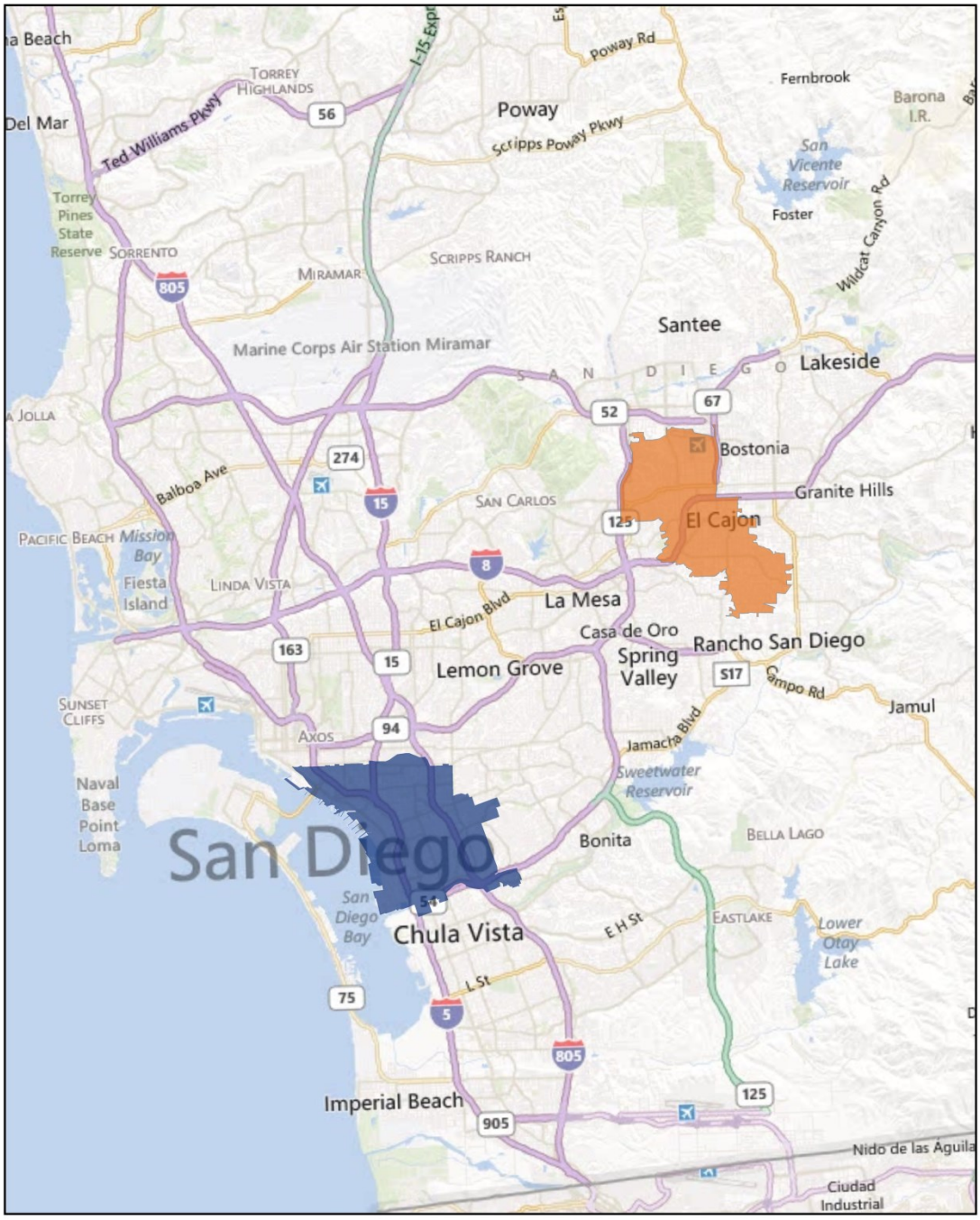
0 2.5 5 10 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

Top 5% of Statewide ZIP codes

Top 6 - 10% of Statewide ZIP codes



San Diego Area

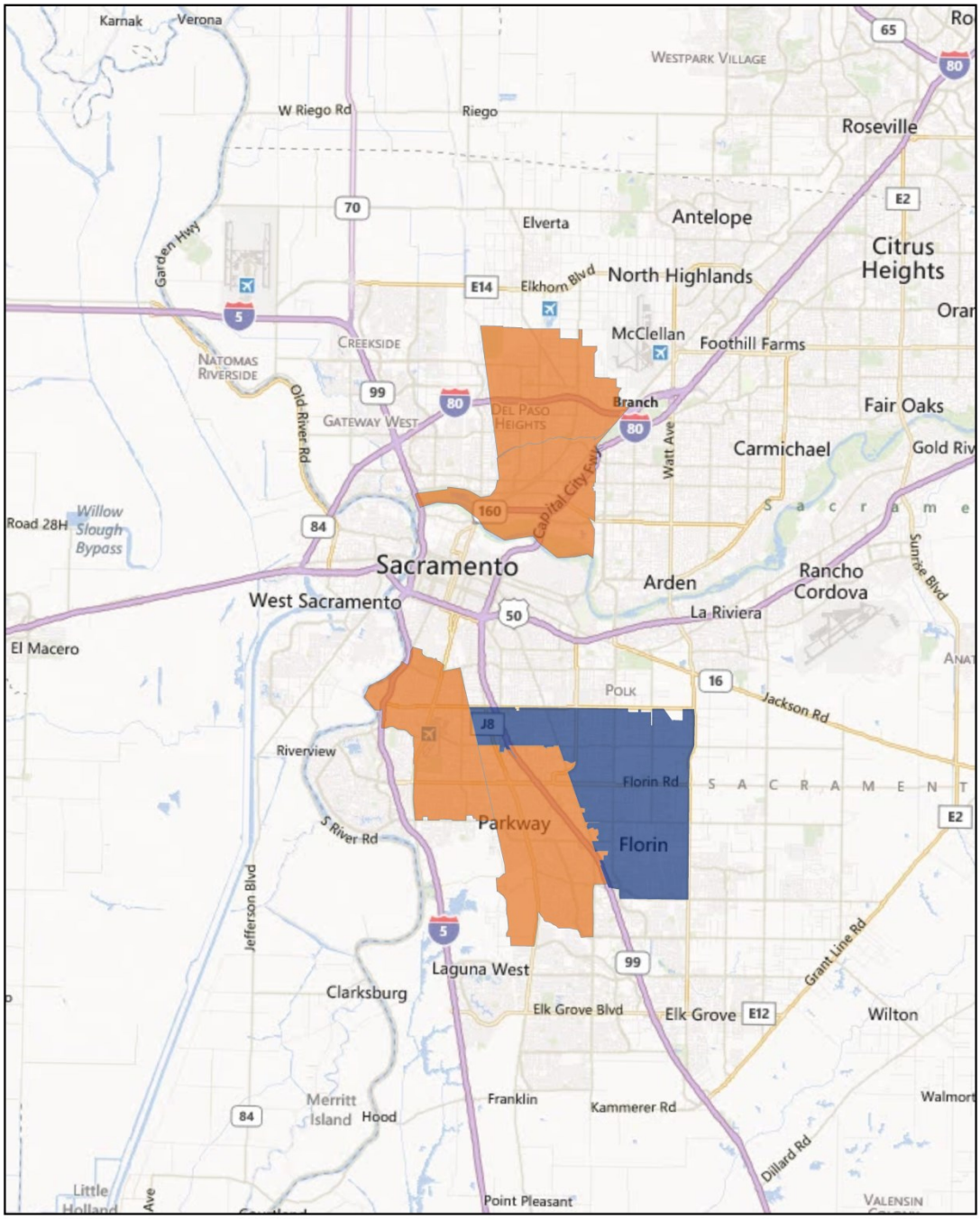
0 2.5 5 10 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

Top 5% of Statewide ZIP codes

Top 6 - 10% of Statewide ZIP codes



Sacramento Area

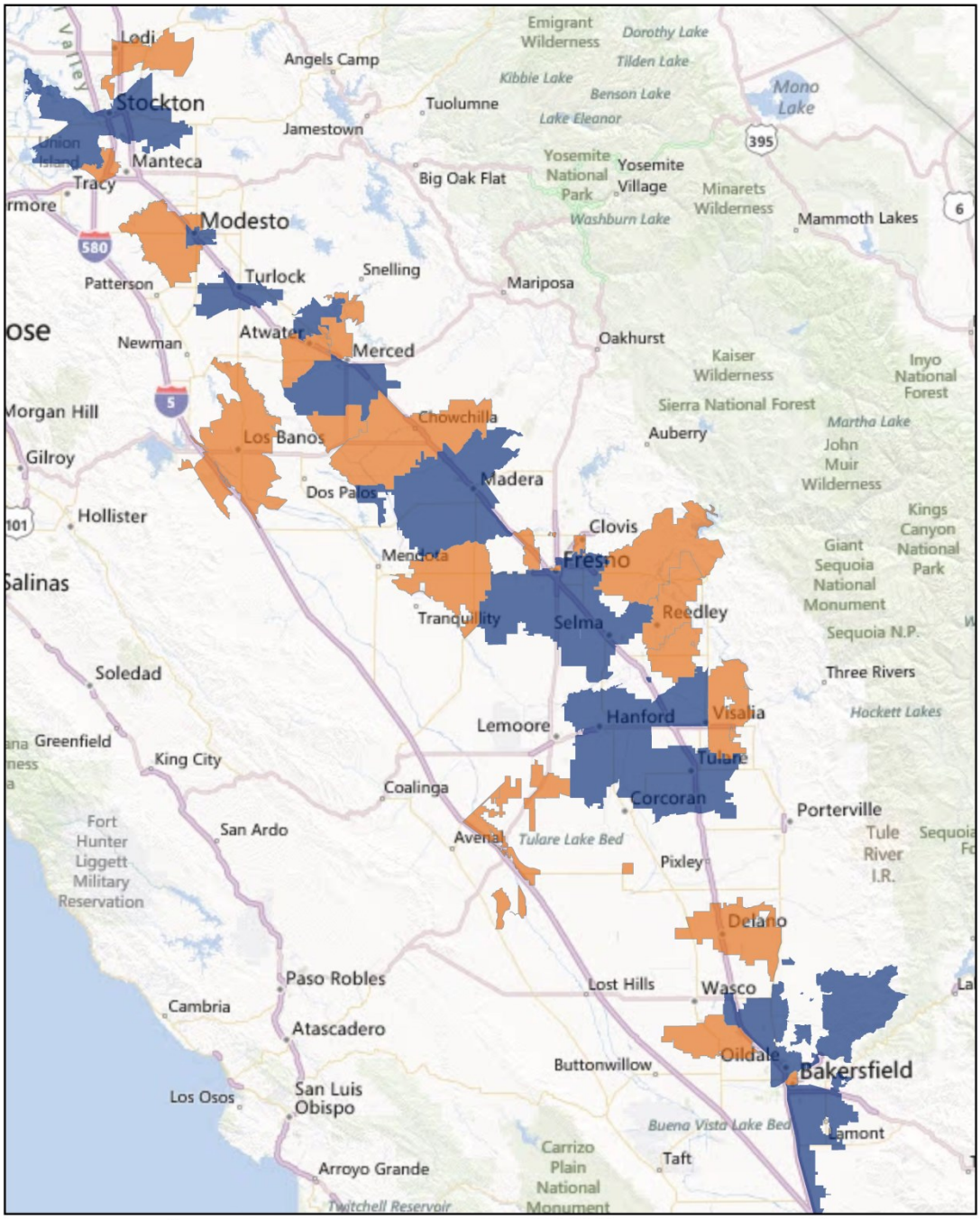
0 2.5 5 10 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

Top 5% of Statewide ZIP codes

Top 6 - 10% of Statewide ZIP codes



San Joaquin Valley

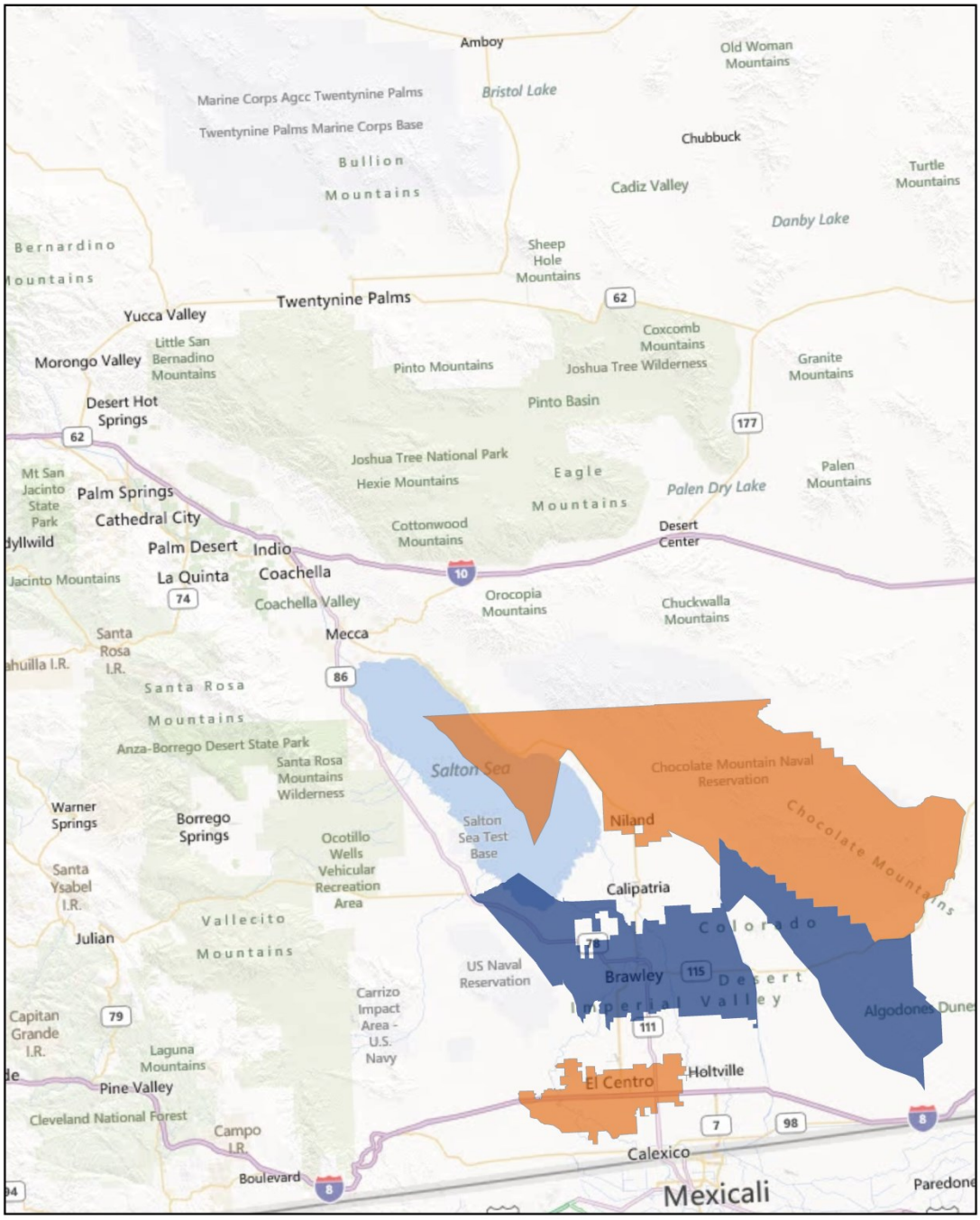
0 10 20 40 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

Top 5% of Statewide ZIP codes

Top 6 - 10% of Statewide ZIP codes

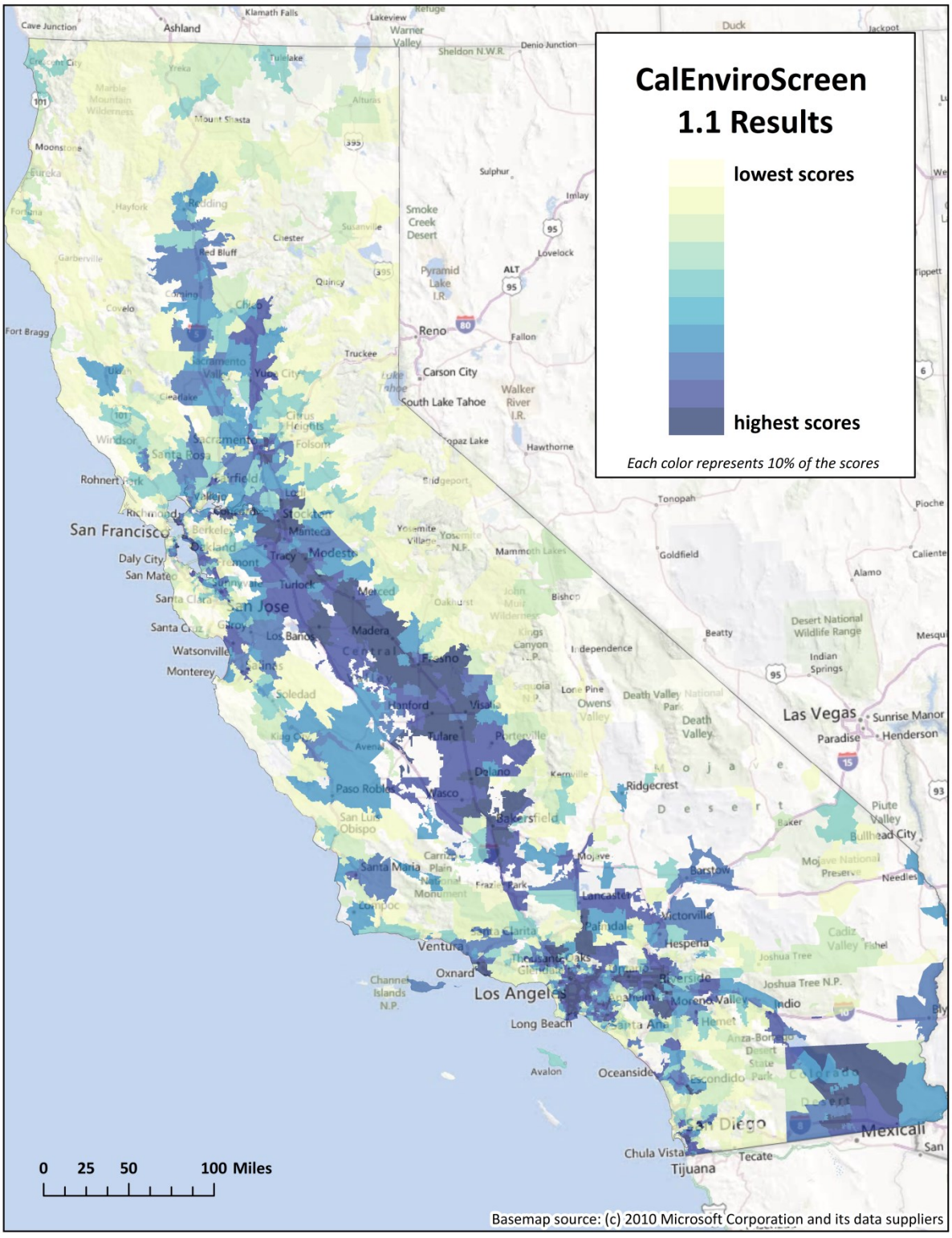


Coachella & Imperial Region

0 5 10 20 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

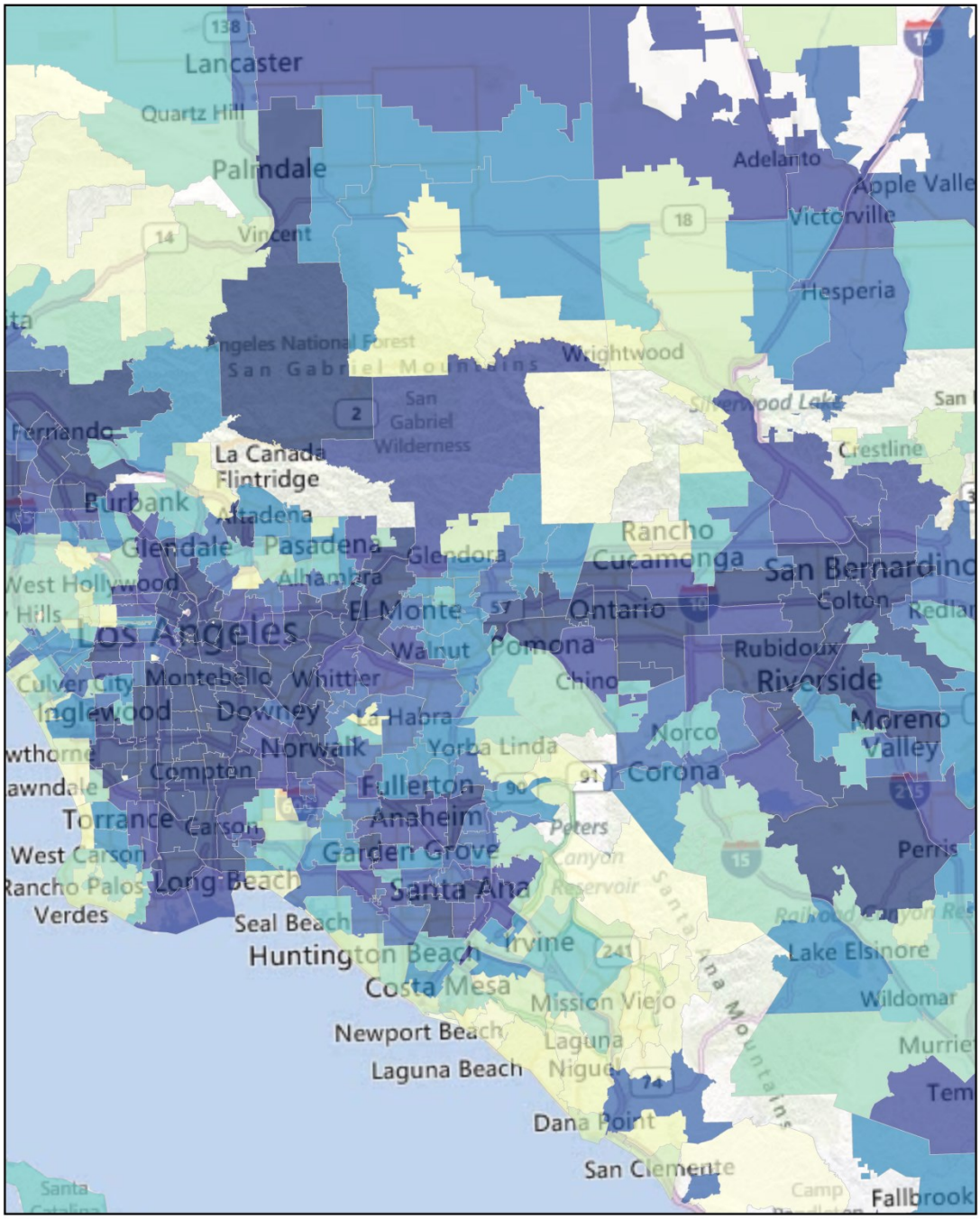
CALENVIROSCREEN STATEWIDE RESULTS



CalEnviroScreen 1.1 Results

lowest scores — highest scores

Each color represents 10% of the scores



Los Angeles Area

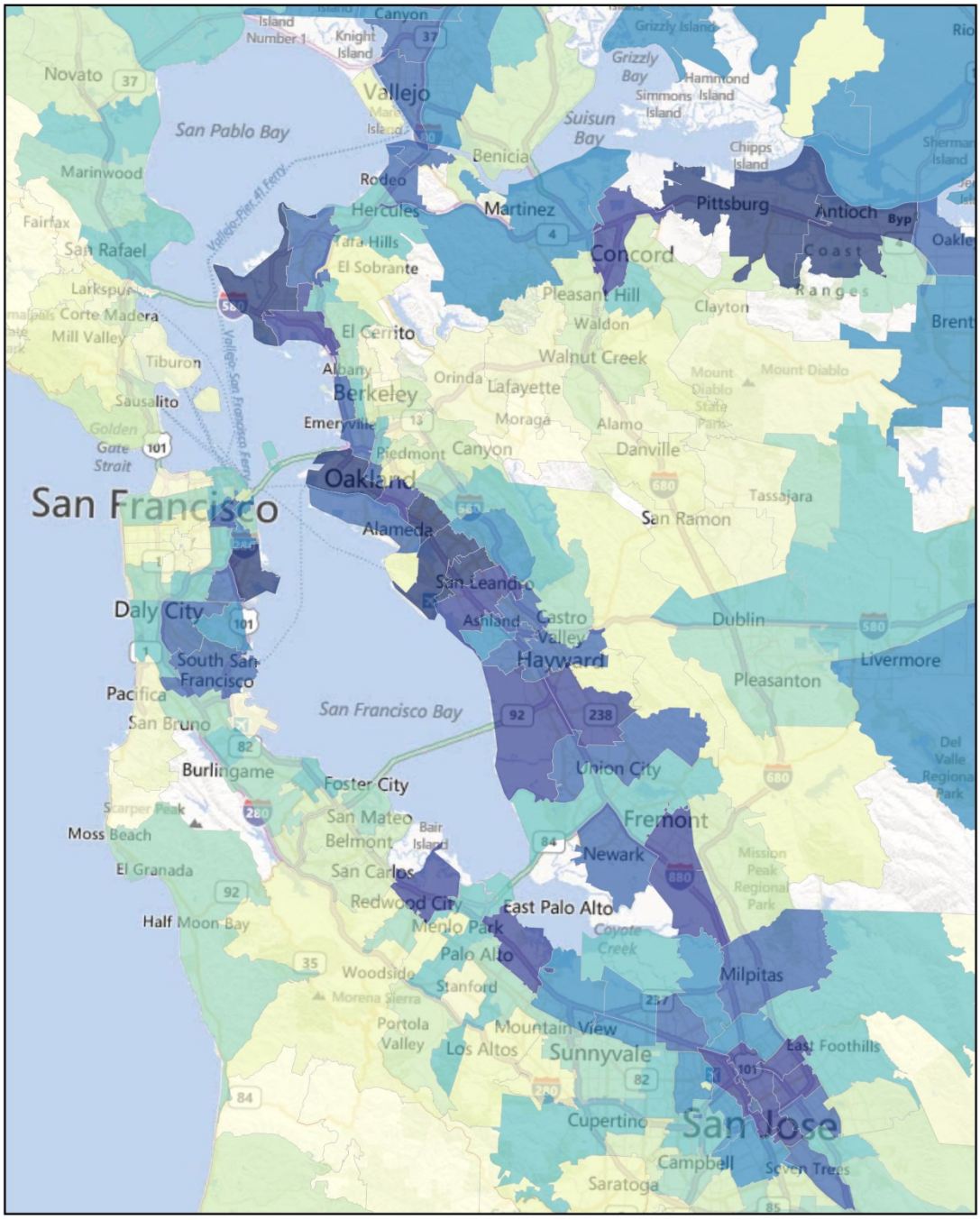
0 5 10 20 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

lowest scores — highest scores

Each color represents 10% of the scores



San Francisco Area

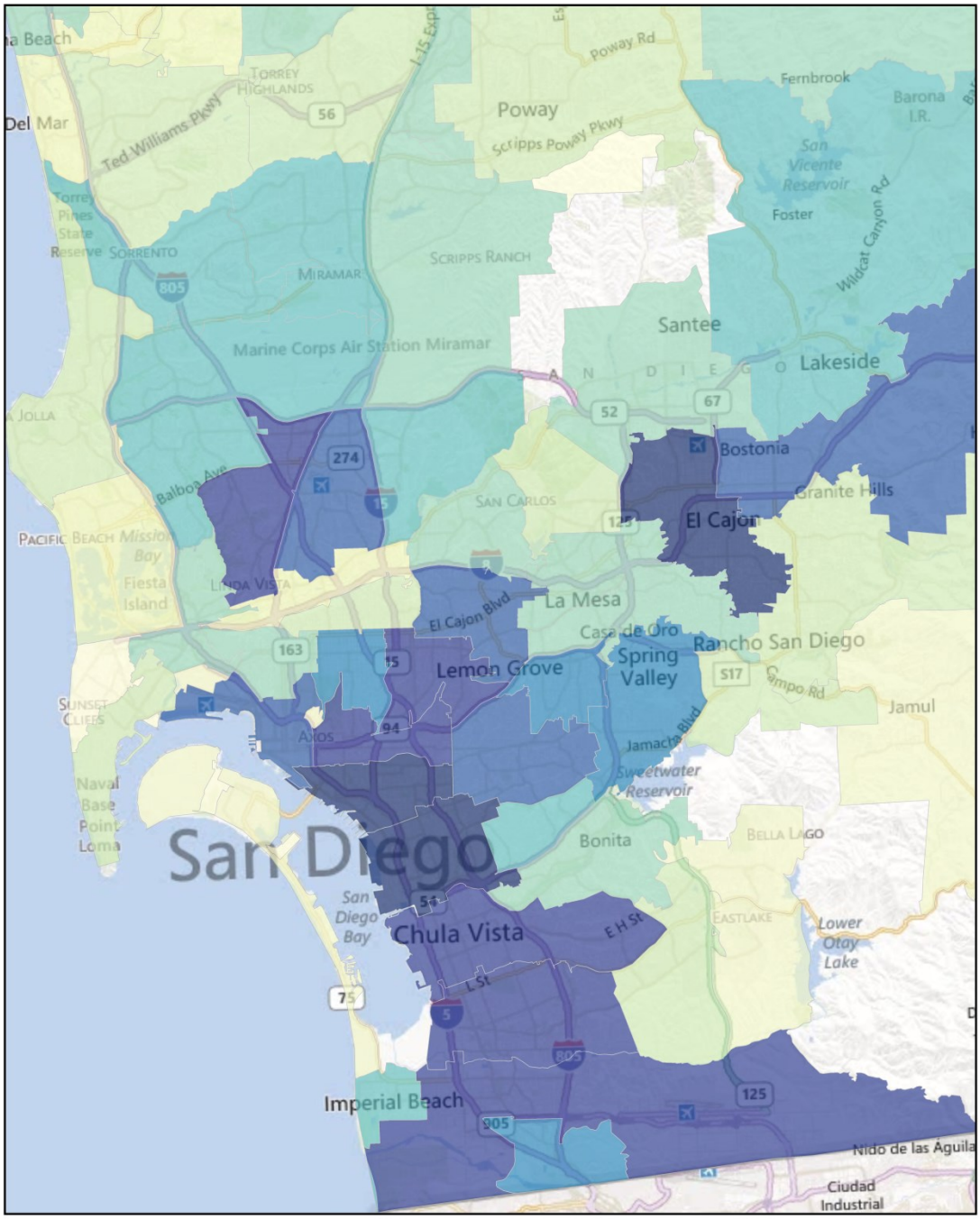
0 2.5 5 10 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

lowest scores — highest scores

Each color represents 10% of the scores

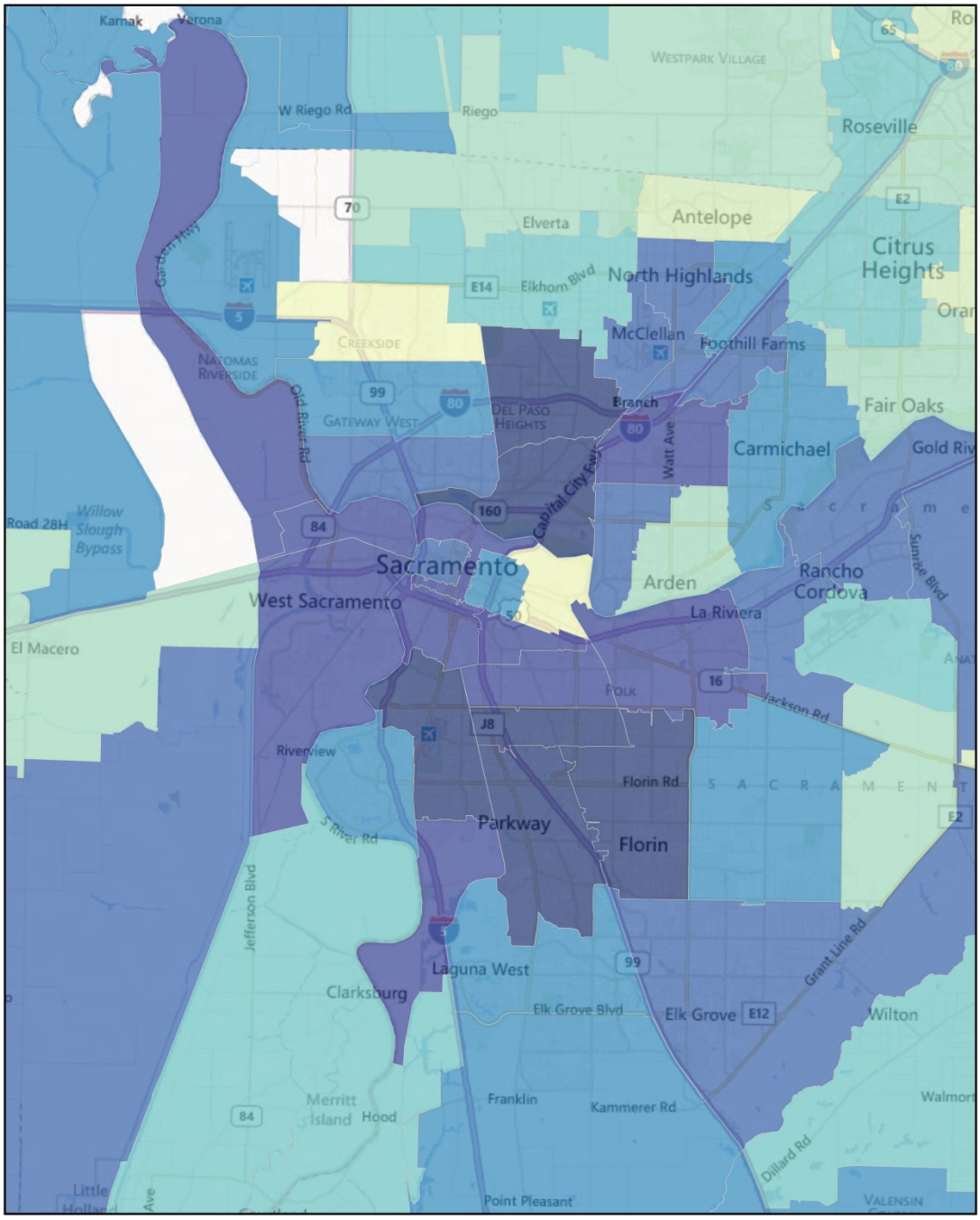


San Diego Area

0 2.5 5 10 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

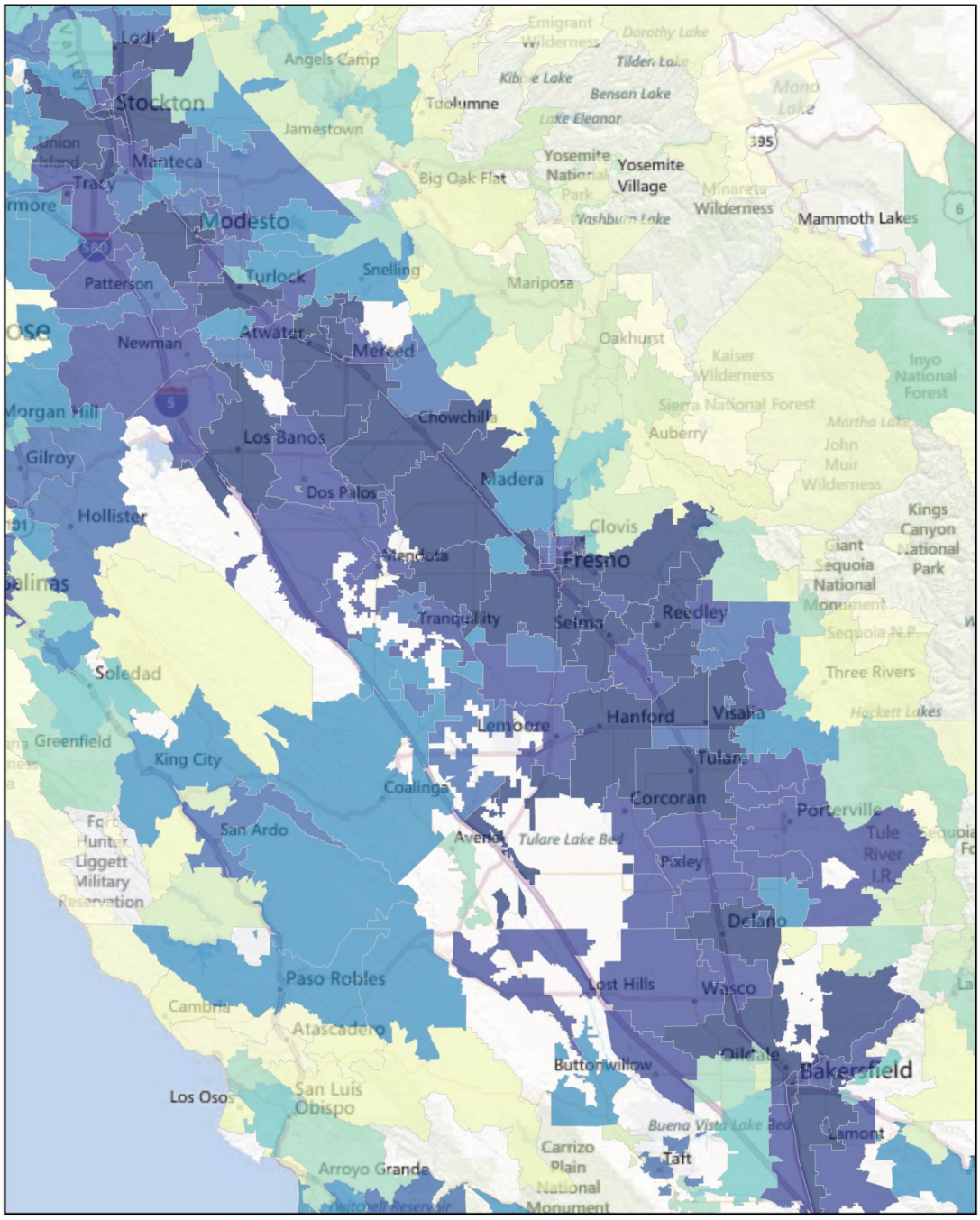


Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

lowest scores — highest scores

Each color represents 10% of the scores



San Joaquin Valley

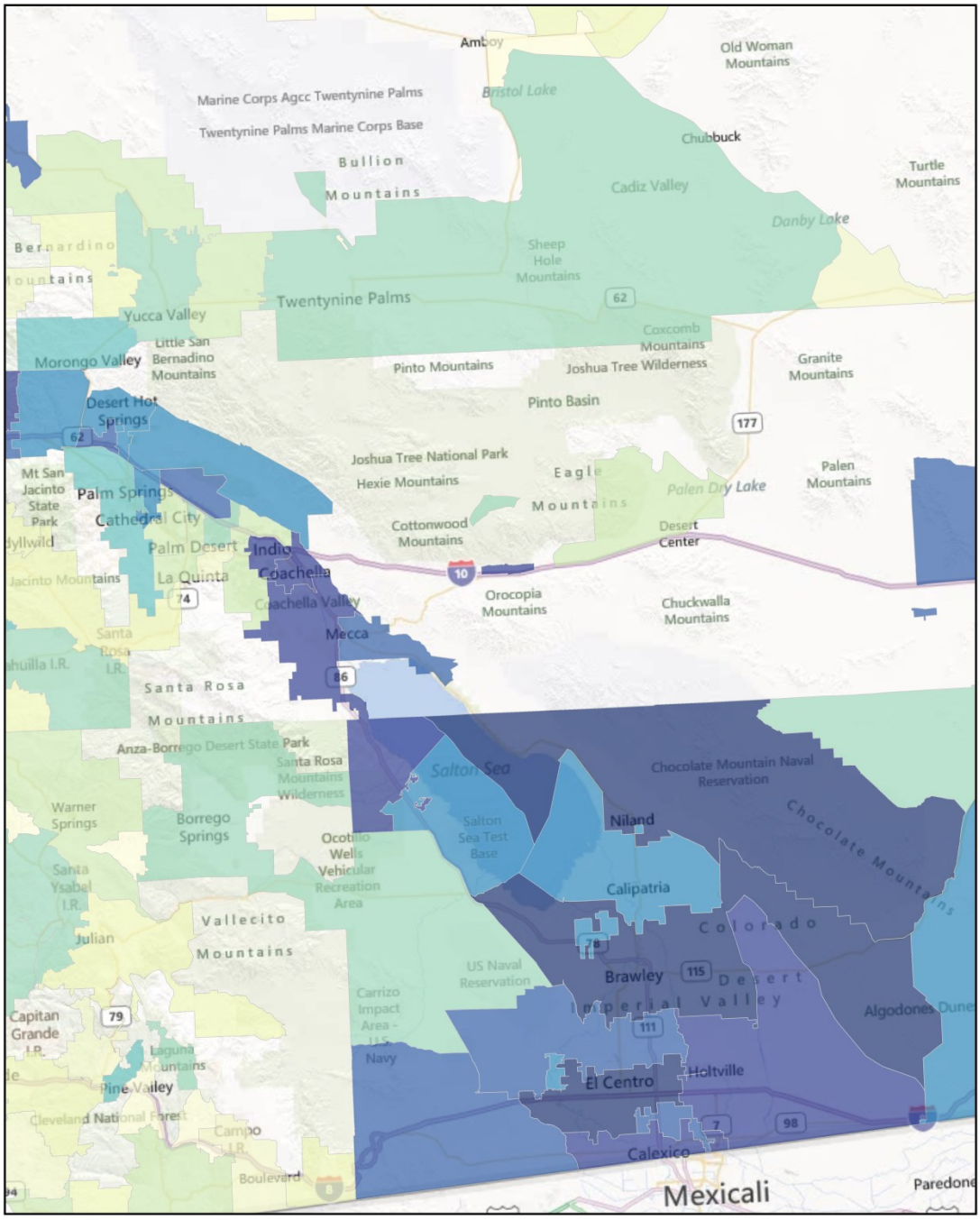
0 10 20 40 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

CalEnviroScreen 1.1 Results

lowest scores — highest scores

Each color represents 10% of the scores



Coachella & Imperial Region

0 5 10 20 Miles

Basemap source: (c) 2010 Microsoft Corporation and its data suppliers

ANALYSIS OF CALENVIROSCREEN 1.1 SCORES AND RACE/ETHNICITY

The CalEnviroScreen 1.1 scores represent a combined measure of pollution and the potential vulnerability of a population to the effects of pollution. Unlike CalEnviroScreen 1.0, Version 1.1 scores do not include a measure of race/ethnicity in the calculation of the CalEnviroScreen score. The removal of race/ethnicity from the score does not minimize the importance of examining this issue in the context of environmental impacts and vulnerability. This section presents some of the scientific evidence related to the vulnerability to pollution of some racial/ethnic groups, and provides an analysis of the relationship between CalEnviroScreen scores and race/ethnicity.

Scientific research indicates that the relationship between pollutant exposure, stress, and health outcomes can vary based on the race and ethnicity of a population. For example, studies have shown that maternal exposure to particulate pollution results in a greater reduction in infant birth weight among African-American mothers than white mothers (Bell *et al.*, 2007). Another study found that African-American mothers of low socioeconomic status exposed to traffic-related air pollution had twice the likelihood of delivering a preterm infant compared to white mothers of low socioeconomic status (Ponce *et al.*, 2005). A study of traffic exposure and spontaneous abortion also found a greater effect for African-American women than other racial and ethnic groups (Green *et al.*, 2009).

For children, a study of the effects of nitrogen dioxide (NO_2) on children without health insurance in Phoenix found that Hispanic children had twice the risk of hospitalization for asthma from NO_2 exposure as white children. Black children showed about twice the risk of asthma hospitalization from NO_2 exposure as Hispanic children, regardless of insurance status (Grineski *et al.*, 2010).

Differences have also been observed for the effect of PM2.5 exposure on emergency department visits for asthma among patients of different races. The effect was found to be significant and greater in African American populations compared to Caucasians for the first three days following exposure (Glad *et al.*, 2012). Additionally, higher mortality has been observed among African-American populations exposed to ozone than other populations exposed to the same levels (Medina-Ramon and Schwartz, 2008).

In Native American children, rates of overweight and obesity are higher than among non-Native populations, potentially due in part to psychosocial stressors, lack of access to healthy food, and exposure to environmental obesogens (Schell and Gallo, 2012). Native Americans have lower life expectancy and higher rates of certain chronic diseases than the U.S. population as a whole.

The mechanisms by which differences in race or ethnicity may lead to differences in health status and response to pollutants are complex and are not well understood. Some studies have explored

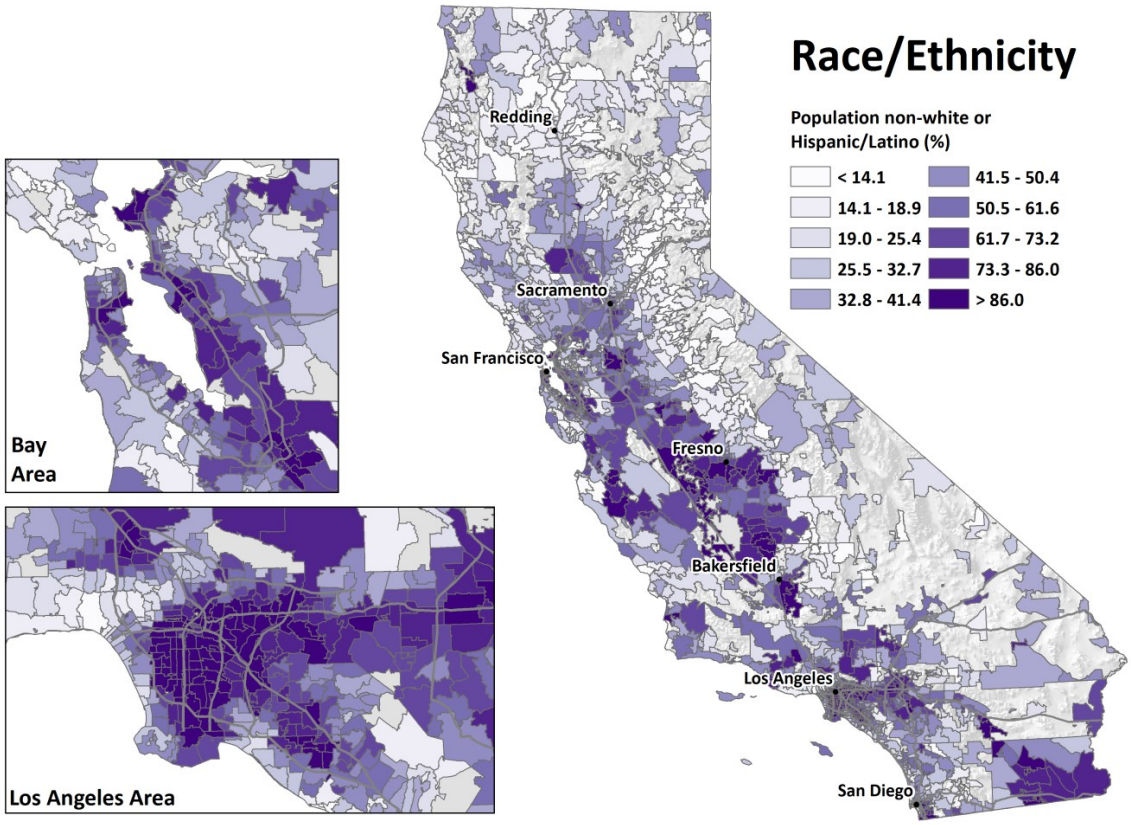
the relationship between the experience of racism as a form of chronic stress and human health (Paradies, 2006; Kwate *et al.*, 2003), while others have looked at racial discrimination as an aspect of socioeconomic disadvantage, along with residential crowding, noise, poor housing quality, reduced access to health care, and exposure to violence (Evans and Marcynyszyn, 2004; Geronimus, 1996; Mertz and Grumbach, 2001, Williams and Williams-Morris, 2000; Clark *et al.*, 1999). A study of the effect of blood lead level on blood pressure found that there are significant racial and ethnic disparities, with the strongest association occurring in African Americans with symptoms of depression (Hicken *et al.*, 2013). The authors suggest that this finding presents evidence for the role that social stressors play in determining vulnerability to the health impacts of environmental exposures.

We evaluated potential associations between race/ethnicity and CalEnviroScreen 1.1 scores using data from the 2010 decennial census. The U.S. Census Bureau questionnaire asked all census respondents to identify if they were of Hispanic, Latino or Spanish origin and in a separate question, their race. Datasets describing the number of individuals in different race and ethnicity categories are available for California at different geographic scales. The data are made available using the American FactFinder website (http://factfinder2.census.gov/). Differences in racial and ethnic composition across California can be estimated using these data.

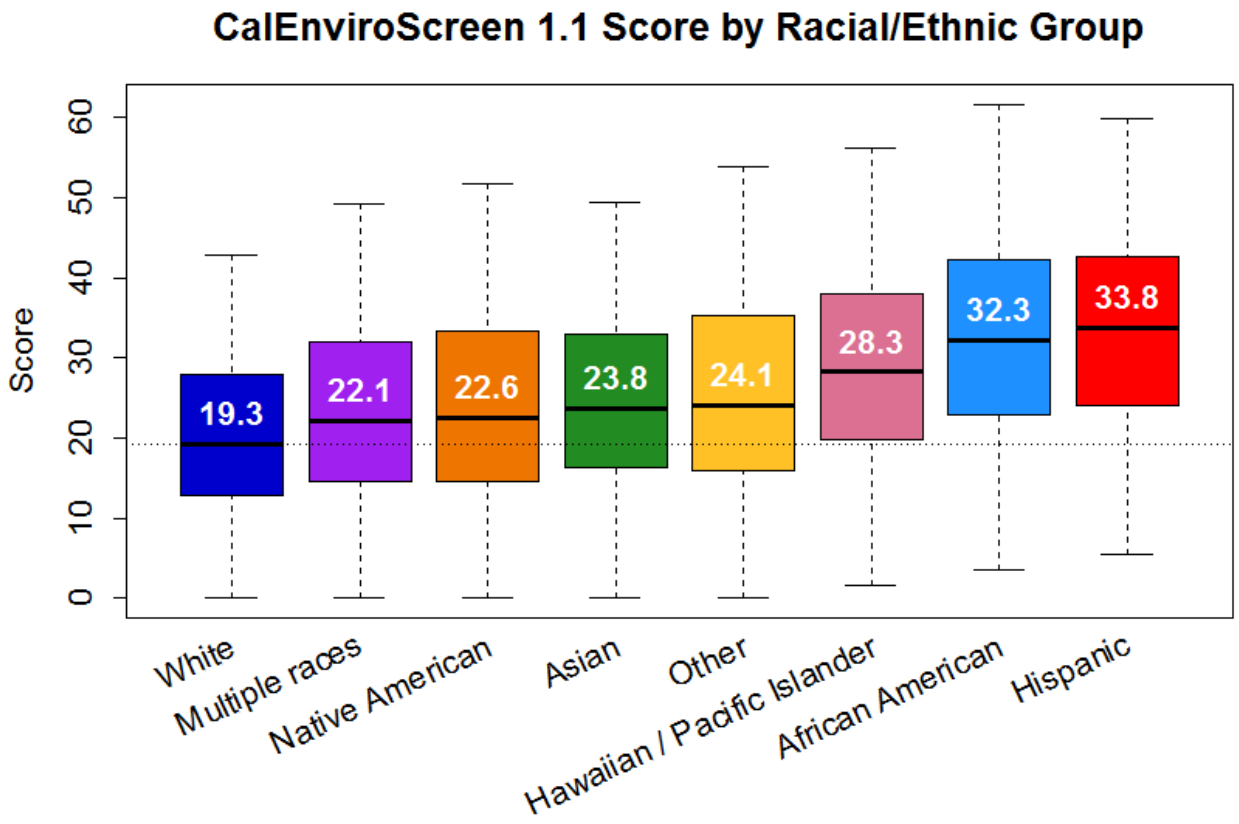
Our analysis examined race/ethnicity using the following steps:

- A dataset containing the number of people by race/ethnicity was downloaded by census ZIP codes for the State.
- The non-white percentage of the population in each ZIP code was calculated as the total number of people identified as non-white or Hispanic/Latino in the ZIP code divided by the total population of the ZIP code.
- ZIP codes were ordered by the percentage of the population that is non-white or Hispanic/ Latino). A percentile score for a ZIP code was determined by its place in the distribution of all ZIP codes.

The mapping results of the statewide analysis of race/ethnicity are shown below:

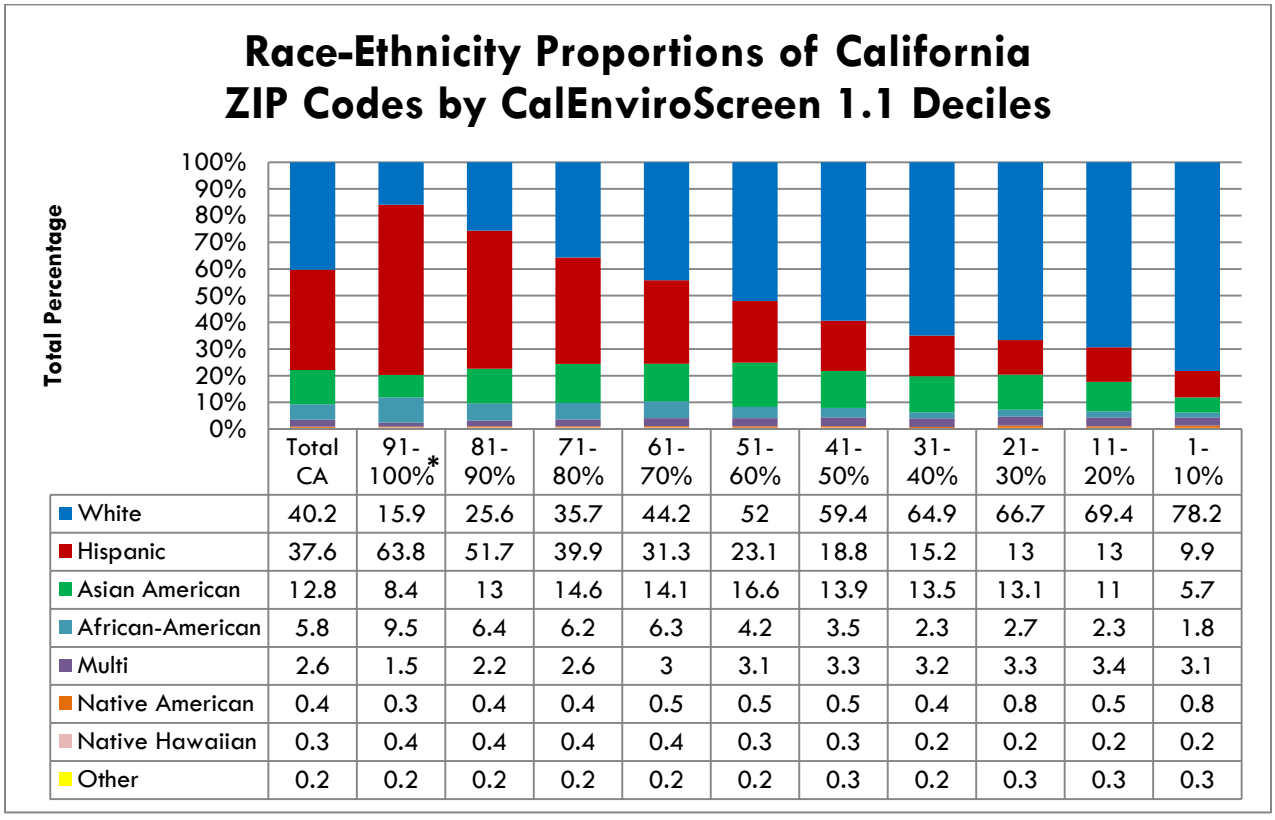


The following chart shows the typical range of CalEnviroScreen 1.1 scores pertaining to Californians of different races and ethnicities. The dark horizontal lines in each box plot, and the numbers above them, indicate the median (average) CalEnviroScreen score for each racial or ethnic group. The shaded boxes correspond to the "Interquartile Range" (IQR), or the range of values between the 25th to 75th percentile. The dashed vertical lines coming off each box show extreme values experienced by the groups.



The chart below examines how the racial/ethnic composition of ZIP codes varies by CalEnviroScreen scores. ZIP codes across the state were divided into ten categories with equal numbers of ZIP codes (deciles), sorted from highest (91-100 percentile) to lowest CalEnviroScreen scores (1-10 percentile). The overall racial/ethnic composition of the California population is represented by the first vertical bar on the left side of the chart. The second vertical bar represents the ten percent of ZIP codes with the highest CalEnviroScreen scores, the third vertical bar represents the ten percent of ZIP codes with the next highest CalEnviroScreen scores, and so on. The percent of the population of different races/ethnicities in each decile is shown in the column below each bar.

If all racial/ethnic groups were equal in terms of CalEnviroScreen score, the proportion of each group in each decile would be equal to its overall proportion in the California population. That is, an even distribution of pollution burden and population vulnerability across racial and ethnic groups would mean that all the bars would resemble the left-most bar in the chart. However it is clear from the chart that this in not the case, implying that pollution burden and population vulnerability are not distributed evenly across different racial/ethnic groups.



	Total CA	91-100%*	81-90%	71-80%	61-70%	51-60%	41-50%	31-40%	21-30%	11-20%	1-10%
White	40.2	15.9	25.6	35.7	44.2	52	59.4	64.9	66.7	69.4	78.2
Hispanic	37.6	63.8	51.7	39.9	31.3	23.1	18.8	15.2	13	13	9.9
Asian American	12.8	8.4	13	14.6	14.1	16.6	13.9	13.5	13.1	11	5.7
African-American	5.8	9.5	6.4	6.2	6.3	4.2	3.5	2.3	2.7	2.3	1.8
Multi	2.6	1.5	2.2	2.6	3	3.1	3.3	3.2	3.3	3.4	3.1
Native American	0.4	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.8	0.5	0.8
Native Hawaiian	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2
Other	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3

* The "91-100%" column shows the population composition of the ZIP codes with the highest CalEnviroScreen 1.1 scores. The 1-10% column represents those ZIP codes in the lowest scores.

These results also show broad trends in differences by race/ethnicity across CalEnviroScreen scores. Hispanic, African-American, and to some extent Native Hawaiian /Pacific Islander populations tend to have higher CalEnviroScreen 1.1 scores than other groups and are proportionally overrepresented in the highest scoring ZIP codes (81-90 and 91-100 percentiles) relative to their proportion of the California population. The white population tends to have a lower score and is underrepresented in the highest scoring ZIP codes relative to its proportion of the statewide population.

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