



APPENDICES A THROUGH H

FOR
DRAFT
PROGRAMMATIC AND PROJECT-LEVEL
ENVIRONMENTAL IMPACT REPORT

FOR THE

MANTECA FAMILY ENTERTAINMENT ZONE
(SCH: 2014022008)

APRIL 28, 2015

Prepared for:

Manteca Community Development Department, Planning Division
1001 West Center Street
Manteca, CA 95337
(209) 456-8511

Prepared by:

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762
(916) 580-9818

D e N o v o P l a n n i n g G r o u p

A Land Use Planning, Design, and Environmental Firm



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NOTICE OF PREPARATION – 1ST CIRCULATION

Notice of Preparation of an Environmental Impact Report and Scoping Meeting

Date: February 4, 2014

Subject: Notice of Preparation of an Environmental Impact Report and Scoping Meeting for Manteca Family Entertainment Zone

To: State Clearinghouse
State Responsible Agencies
State Trustee Agencies
Other Public Agencies
Organizations and Interested Persons

Lead Agency: Mark Meissner, Planning Manager
Manteca Community Development Department, Planning Division
1001 West Center Street
Manteca, CA 95337
(209) 456-8511

Notice of Preparation: This is to notify public agencies and the general public that the City of Manteca, as the Lead Agency, will prepare an EIR for the Manteca Family Entertainment Zone. The City of Manteca is interested in the input and/or comments of public agencies and the general public as to the scope and content of the environmental information that is germane to the agencies' statutory responsibilities in connection with the proposed project, and public input. Responsible/trustee agencies will need to use the EIR prepared by the City of Manteca when considering applicable permits, or other approvals for the proposed project.

Comment Period: Consistent with the time limits mandated by State law, your input, comments or responses must be received in writing and sent at the earliest possible date, but not later than 5:00 p.m., March 5, 2014.

Comments/Input: Please send your comments/input (including the name for a contact person in your agency) to: Attn: Mark Meissner at the City of Manteca, 1001 West Center Street, Manteca, CA 95337.

Scoping Meeting: On February 20, 2014 the City of Manteca will conduct a public scoping meeting to solicit input and comments from public agencies and the general public on the proposed project and scope of the Environmental Impact Report (EIR). This meeting will be held at Administration Conference Room at the Manteca City Hall from 2 to 3 p.m.

This meeting will be an open house format and interested parties may drop in to review the proposed project exhibits and submit written comments at any time between 2 to 3 p.m. Representatives from the City of Manteca and the EIR consultant will be available to address questions regarding the EIR process and scope. Members of the public may provide written comments throughout the meeting.

If you have any questions regarding the scoping meeting, contact Mark Meissner, Planning Manager at (209) 456-8511 or mmeissner@ci.manteca.ca.us.

Project Title: Manteca Family Entertainment Zone

Project Location: The Project site is located along the west side of the City off of Daniels Drive within close proximity to State Route (SR) 120. The site includes 187 acres to be developed with various public serving regional and local recreation, parks and sporting facilities including visitor serving commercial uses and public infrastructure to be developed in phases.

Project Description:

1. Introduction

Since 2010, the City of Manteca has been in the process of developing a plan for a comprehensive multi-purpose public use zone called the Manteca Family Entertainment Zone (FEZ). The Plan will encompass multiple projects and parcels that in the aggregate will provide an extensive park and recreation complex featuring 189 acres of new and existing recreational, park, water, sports and other leisure amenities. The FEZ planning area will be open and accessible to the general public, and is designed to serve the state, region, and the Manteca community as a multipurpose recreation center and public park facility. The FEZ will feature a wide range of active and passive open space and developed uses that will support short term and longer term activities and community events for users ranging from local citizens, day and weekend regional visitors, as well as destination tourists.

The City of Manteca is in process of developing a Master Plan for the FEZ in cooperation with the two private sector developers who are proposing to design and build the facility. The Master Plan will provide the zoning designation of the FEZ as well as provide development standards to implement future development.

Projects and uses in the FEZ may be constructed and operated through a series of third party agreements, concessions and/or licensing agreements which may include ground leases of up to 55 years, with some uses needing longer lease terms up to 99 years. Projects and uses may be constructed and operated through a series of private-public partnerships whereby private sector operators and vendors of various public facilities are selected to develop and operate components of the FEZ. These components may include: public active and passive recreation and park facilities and sports amenities, and various commercial operations that are ancillary to the foregoing public facilities.

The FEZ will include public active and passive recreation and sporting facilities to be operated by public agencies and/or private sector vendors or operators, including the addition of the two

ball fields adjacent to Big League Dreams (BLD) Park, as well as the addition of several multi-purpose playfields, primarily for soccer.

Certain project components of the FEZ will be public visitor serving in support of the extended use of the various public recreation and sporting amenities (such as hotels and conference centers). Proposed and future development projects will include recreation tourism facilities such as overnight lodging, conference/convention/exhibition facilities and specialized recreation attractions such as an indoor water park available to overnight guests and community members. The primary objective of such uses is to expand the access to current and future public sports and recreation facilities, and expand access for out of area public participation in tournaments and training camps. These features will enable and increase the number and duration of extended stay periods for visitors, and help facilitate public access for broader uses, such as special events and on-site educational activities. Certain components and phases of the FEZ may include commercial retail and restaurant uses that serve park facility patrons and tournament participants and spectators, as well as local clientele.

Formation of one or more Community Facilities Districts (CFD) is also planned for the FEZ. The objective in forming CFDs is to provide financing for public improvements associated with the project, which may supplement funds available from former redevelopment bond proceeds.

A. PHYSICAL CHARACTERISTICS OF FEZ PLAN AREA

The FEZ project ("project") is located to the north and west of the Stadium Shopping Center, to the west of Milo Candini Drive, to the east of McKinley Avenue, to the south of the City of Manteca Wastewater Quality Control Facility (WQCF), and to the north of State Route 120. The property is comprised of approximately 189 acres.

The primary infrastructure systems will be publicly owned and operated and will be sized to meet the demands created by build-out of the project. The City anticipates making use of available proceeds from existing redevelopment bonds to finance public infrastructure improvements, including necessary public roads, water, sewer, and storm water/flood control facilities.

Development of the FEZ will include several separate distinct projects constructed in phases over an estimated period up to 15 years. Phases of development are expected to include construction of public recreation facilities, tournament playfields, retail, dining, outdoor recreation, and family entertainment uses. The project will also include the extension of city streets to provide access to and circulation within the FEZ project.

B. GENERAL PROJECT COMPONENTS

- Construction of a 500 to 700 room hotel, with indoor waterpark, convention/meeting/exhibition facility, and approximately 1,100 to 1,430 parking spaces.
- Construction of 5-10 grass playfields, open to the public for soccer and other outdoor tournament team sporting events and practice activities.

- Construction of restaurants, food and beverage, retail, amusements, arcades and other visitor amenities.
- Construction of an outdoor adventure area offering a variety of climbing and other exercise options for the public.
- Construction of a lake/detention basin to accommodate the storm drainage needs of the development, and also serve as an amenity for public visits, activities and gatherings.
- Construction of public parking facilities to accommodate sports tournament participants, spectators, convention attendees and other visitors to the site.
- Construction of roadways, pedestrian pathways, sewers, storm drainage and other public infrastructure to allow for access to and development of the site.

2. Statement of Project Objectives

The City of Manteca objectives are as follows:

- To expand and improve public and community access to the City's existing and thriving investments in regional sports facilities to provide additional community-based facilities to extend the City's position as the primary destination for family-based community recreation, active recreation sports and passive recreation and amenities in Central California.
- To enhance and build upon the regional tourism and visitor serving attractions providing supporting destination facilities such as hotels, indoor waterpark and convention/meeting/exhibition facilities that will facilitate and support the frequency and duration of utilization of the recreation and sports facilities through the FEZ.
- To enhance Manteca's reputation as "The Family City".
- To position Manteca to serve what is projected to be a trend toward a younger population in the region by providing an excellent youth sports and entertainment destination with critical mass to ensure its success.
- To provide facilities that support what has been identified as a growing trend toward family vacations being centered on regional youth, adult and master's tournaments, as well as league sporting events, that require multiple day stays and can be tied to a variety of visitor interests including special events, education seminars, private events such as conferences, weddings, other social and cultural expositions, all of which are available to the public and the visitors/users of the FEZ.
- Specifically, to capitalize on the success of the Big League Dreams' sports facilities (currently booked weekends, two years in advance), by creating additional critical mass in regional sports and active facilities.

- To provide additional food & beverage facility choices to serve visitors to Manteca and users of the various facilities developed within the boundaries of the FEZ.
- To add to the proven regional draw enjoyed by Woodward Soccer Fields, which further helps to define Manteca as a regional tournament sports destination.
- To accentuate the site's strategic location along SR 120, which serves as the primary vehicular corridor from the Bay Area to Yosemite National Park and the Southern Sierra Nevada Mountain Areas.
- To raise the City's visibility in the region, particularly for all residents and citizens driving through the region.
- To create a Yosemite/Southern Sierra Nevada Visitors Information Center for travelers to utilize on their trip to the national park and nearby national forests.
- To create a business center facility that is available to all groups and can utilize and augment utilization of the various active and passive recreation and sports facilities as well as all ancillary concessions and operations such as support retail and dining facilities.
- To expand upon the thriving regional draw of Bass Pro Shops, which lies just across SR 120 to the southeast.
- To provide a walkable, safe, friendly, leisure and recreation environment for the citizens of Manteca and the region.
- To provide quality indoor and outdoor community gathering spaces for socializing, dining and entertainment.
- To expand and install a series of public improvements in support of the FEZ, including but not limited to, the east-west vehicular connection between McKinley Avenue and Airport Way, and public parking facilities throughout the FEZ, extension of Milo Candini Drive from Daniels Street to Yosemite Avenue, to facilitate improvements to the storm water drainage system shared by the City and the South San Joaquin Irrigation District (SSJID).
- To facilitate the City's economic development and jobs-creation goals and objectives.

3. History and Context

Manteca is an incorporated City situated in the south central portion of San Joaquin County, in the Central Valley of California. Referred to by the Manteca Chamber of Commerce as "The Heart of California", Manteca is located approximately 76 miles east of San Francisco, 12 miles south of Stockton, and 14 miles northwest of Modesto. Manteca has an annual rainfall of 11.8 inches, and average temperatures ranging between 47 and 73 degrees Fahrenheit.

Often referred to as “The Family City”, Manteca was founded in 1861 by Joshua Cowell, at the corner of Main Street and Yosemite Street. In 1873, the Central Pacific Railroad laid track through the area, and the City was incorporated in 1918. In 1955, the City adopted its first zoning ordinance, and in 1962, it’s first General Plan.

At an elevation of approximately thirty-eight feet, Manteca has grown to encompass approximately 17.6 square miles and a population of approximately 71,000, with approximately 1.3 million people within a thirty-mile radius. Historically an agricultural community, relatively affordable housing is expected to drive residential growth in the coming years.

4. Regional Access and Circulation

A. VEHICULAR ACCESS

The Manteca FEZ property is located on the western edge of the City, to the north of SR 120 and the Stadium Shopping Center, between McKinley Avenue on its west and Airport Way on its east. Downtown Manteca lies to the north and east of the property, and is easily accessed via Yosemite Blvd.

The City is strategically located close to and within view of SR 120, which provides primary access to Yosemite from the San Francisco Bay area. The City also lies between two major north-south freeways, I-5 and State Route 99.

Regional access to the Manteca FEZ site is primarily anticipated to be via SR 120 at the Airport Way interchange that lies to the south and east of the property. In the future, an additional SR 120 interchange is planned to be constructed to the south and west of the property at McKinley Avenue. This proposed new interchange would provide additional access to the property, particular for those traveling from the Bay Area and points to the west.

Locally, vehicular access will be achieved by public streets and roadways as follows: from Airport Way and then Daniels Street, which runs along the north side of the Stadium Shopping Center. Daniels Street has been proposed to be extended from its current end point, in a westerly direction across to McKinley Avenue. Additionally, it is anticipated that Wawona Street will be extended in a westerly direction from Airport Way, to allow it connect with Milo Candini Drive.

The City of Manteca also plans to extend Milo Candini Drive, a public street, in a northerly direction from its current terminus that lies at the northeast corner of the Big League Dreams site, up to Yosemite Avenue to a new signalized intersection.

B. PASSENGER RAIL

In addition to vehicular access, regional rail service for commuters to San Jose and Silicon Valley is provided on the by Altamont Commuter Express (ACE), on the Union Pacific Railway Line, with a stop at the Lathrop/Manteca station, which lies to the northwest of the property. The ACE Rail system also has a bus connection to the Dublin/Pleasanton BART station at the Pleasanton stop.

5. Existing Land Uses:

The FEZ property currently has a General Plan Land Use designation “Public/Quasi-Public” (PQP), and a zoning designation of PQP. The land is owned entirely by the City of Manteca. The vacant land portion of the site is currently used for land application of treated effluent from the WQCF. The only structure located on the property is a single-wide mobile home unit that was formerly used in conjunction with the Manteca Police Department shooting range, which was located on the site. The shooting range will need to be decommissioned and inspected for possible contamination from ammunition.

Big League Dreams ballpark is located on the eastern side of the FEZ. The 28 acre site is fully developed with six replica ballparks, an indoor soccer facility, two restaurants and other supporting facilities all of which are open to the public and operated by private sectors parties pursuant to ground leases.

6. Surrounding Land Uses:

North: The boundary on the north of the property is primarily occupied by the WQCF. The property to the north is zoned PQP (Public/Quasi-Public).

East: The parcels to the east of the BLD portion of the FEZ, across Milo Candini Drive, are zoned M1 Light Industrial and PQP.

South: The property is bordered on the south by SR 120. There is some additional vacant land lying to the south of the westernmost portion of the site. The property that lies to the south of Big League Dreams is occupied by the Stadium Shopping Center, and is zoned CG (General Commercial).

West: To the west, the property is bounded by McKinley Avenue and the Union Pacific Railway right-of-way. The parcels located to the west of those right-of-ways are outside of the City of Manteca boundary.

7. Proposed Land Uses

The City of Manteca and the Manteca Development Group have conducted a preliminary market feasibility study that has served as the basis for the proposed preliminary land use and facility program. For purposes of analysis, the property is divided into several numbered “Planning Areas”, listed hereafter as “PA”. Subject to updated market studies that will be conducted prior to actual implementation, the developer envisions the following land uses for the project:

A. PUBLIC VISITOR SERVING USES

Situated on approximately 30 acres within the FEZ the hotel use in the initial phase is anticipated to include a 500 room hotel, a conference/exhibition facility, and an indoor waterpark. The entire facility will include approximately 490,000 square feet of building area, with approximately 1,100 surface public parking spaces constructed at grade. Components of the project plan include:

- Approximately 290,000 sf hotel tower up to six stories tall with 500 hotel rooms in a variety of unit types.
- Approximately 37,500 sf of sit down and casual Food & Beverage operations and related game rooms and community spaces, general retail space and party rooms.
- Approximately 20,000 sf Conference/Meeting/Exhibition Facility with divisible main ballroom, breakout rooms, boardroom, business center, and a pre-function area with indoor/outdoor flexible space.
- Approximately 75,000 sf indoor multi-level waterpark park up to 6 stories at highest elevation including various aquatic features, special amenities, and wave pool.
- Hotel expansions may include up to 200 more hotel rooms; 76,000 sf indoor waterpark; 20,000 sf conference/meeting facility; and 330 more parking stalls.

The total floor area of the three Planning Areas (PA-3, PA-4, & PA-5) is illustrated as being approximately 410,000 square feet (sf) of floor space on the ground level, some of which may be two-story space. The total second level square footage could add up to approximately 102,000 sf. Estimated build-out is projected at up to 15 years.

B. ACTIVE AND PASSIVE RECREATION, SPORTS AND PARK FACILITIES (PA-1, PA-1A, PA-1B, PA-2, PA-3, PA-4, & PA-5)

- Baseball/Softball Fields (2)
- Multi-purpose/Soccer Fields (5-10) in varying sizes.
- Shared public parking in PA-15 and PA-14
- Man-made passive lake/retention basin, approximately six (6) acres. Lakeside boardwalk promenade with semi-pervious pavers.
- Small Outdoor Amphitheater
- Outdoor entertainment / performance plaza
- Destination Playground
- Family Party Pavilions
- Beach Volleyball Courts (2)
- Customer/visitor parking and shared parking
- Concessions to support recreation, sporting uses and events and all visitor serving uses
- Retail shops

- Restaurants, cafes, bistro's, coffee shops
- Sports bar/ Micro-brewery

C. YOSEMITE/SOUTH SIERRA NEVADA VISITORS CENTER (PROPOSED TO BE LOCATED IN PA-4 DURING THE INITIAL 5 YEAR PERIOD, AND POSSIBLY RELOCATING TO PA-6 AFTER CONSTRUCTION OF THE MCKINLEY AVE./SR 120 INTERCHANGE)

The City of Manteca has been working diligently to secure this landmark opportunity to provide an information resource to visitors en route to the national forests that lie to the east, and to Yosemite National Park. It may include:

- Visitors Information Center
- Manteca Convention & Visitors Bureau (potential relocation)
- Mini-Bus Terminal for scheduled express transit service to Yosemite National Park
- Short-term daily bus parking for motor coaches travelling through to other destinations

D. FAMILY ENTERTAINMENT CENTER (PA-6, PA-9, PA-10)

The following types of facilities may be offered:

- Miniature golf, family arcade games, Lazertag®, Ball Crawl, black-light bowling and similar recreational uses
- Refreshments
- Public parking

E. ADVENTURE ZONE AND OUTDOOR SPORTS/SPEED ZONE (PA-7, PA-8, PA-11,12, 13,14,15)

The following types of facilities may be offered:

- Rock-climbing wall, ropes course, Flow-rider, Zip-line, Hard Surface Skate Park, and similar recreational uses
- Refreshments
- Public parking
- Indoor All-season Sports Center (PA-8)
- Championship Playfield (PA-11)
- International-sized multi-purpose play field, with bleachers flanking the field. Depending on success of this venue, which is planned to draw regional tournaments, ultimately, more permanent seating might be constructed.

- Outdoor Sports/ Speed Zone (PA-12)
- Stunt BMX Race Course
- Electric motorized mini-car race course

F. PUBLIC PARKING ZONES: (PA-13, PA-14 & PA-15):

The City envisions shared parking to be constructed within the PG&E right-of-way. Clear security parameters would be established with PG&E and state authorities, with respect to maintaining safe distances from PG&E towers, and protecting towers from intrusion.

8. Possible Arrangement and Phasing of Land Uses

PHASE 1:

- Construction of a 500-room hotel, with indoor waterpark, convention/meeting/exhibition facility, and surrounding approximate 1,100 space surface public parking lot.
- Partial construction of a loop road and landscape buffer along the northern edge of the overall property, north of Planning Areas 12 & 15.
- Main Vehicular Entrance: The project will have its main vehicular entrance on Daniels Street, located at a point directly north of the northwest corner of the Stadium Shopping Center.
- The service entrance to the northwest corner of the Stadium commercial vendors and uses and other public uses/facilities will be reconfigured to provide navigable truck turning movements into the rear of that parcel.
- PA-1: The development of 11.8 acre PA-1, with new multi-purpose turf playfields. The plan has been conceptualized such that three International Soccer Fields and two U-12 size fields could be provided, along with one U-8 size field at the northeast corner of the parcel. Alternately, the International Soccer Fields could be divided into two U-12 youth soccer fields, yielding a total of eight U-12 play fields, with the one U-8 size field. In addition, minor facilities for public rest rooms, maintenance, storage and administrative offices may be provided in the parcel. PA-1 would be provided vehicular access by the extension of Milo Candini Road.
- PA-15: Parking for the play fields could be offered through the build-out of a parking lot in PA-15, a 3.1-acre area, located in the PG&E right-of-way.
- PA-2, a 7.6-acre parcel lying to the west of PA-1, would provide additional multi-purpose playfields: two U-12 and two U-13 sized youth soccer fields.
- PA-14: A portion of the PA-14 parking lot may be constructed in this phase, to serve parking needs of players and guests.

- PA-1a & PA-1b: The construction of two new ball fields to the west of the existing Big League Dreams complex.
- The initial extension of Daniels Street, in a westerly direction. Daniels Street will extend from its current terminus at the southeast corner of the property, in a westerly direction, providing access to the proposed hotel site to the south, and to the Retail, Dining and Entertainment District of the FEZ to the north (PA-4 & PA-5).
- Storm water management systems beneath the Daniels Street right-of-way.

PHASE 2:

While the precise order of build out after Phase 1 will be determined by market conditions and funding sources, the following arrangement of land uses is planned:

- The Daniels Street right-of-way will be extended in a westerly/northwesterly direction, ending at a “T” intersection with a new planned road that runs from the north and bends to the west, tying into McKinley Avenue, at the western edge of the property. It is anticipated that utilities will be taken underground within this right-of-way.
- PA-3 includes the following:
 - The FEZ entry archway that spans across Daniels Street, under which vehicles will drive to access the FEZ.
 - Food and beverage enterprises that frame an east-west walkway that is aligned on axis with the existing Big League Dreams complex, extending in a westerly direction, toward the center of the FEZ. This serves as a vital connection between the existing sports facilities and the FEZ. Buildings are expected to be one to two stories tall.
 - Additional restaurants at the northeast corner of Daniels Street and a new loop road that will wrap around the core of the FEZ.
 - Shared surface parking that may serve retail/restaurants in PA-3, as well as the two new BLD ball fields (PA-1a & PA-1b).
 - The extension of Wawona Street in a westerly direction, along the north side of the existing BLD complex and to the south of the new multi-purpose play fields in PA-1 and PA-2, connecting to the FEZ loop road in a southwesterly direction.

PHASE 3:

While the precise order of build out of Phase 3 will be determined by market conditions, the following arrangement of land uses is planned:

- PA-4, including the following:

- “Main Street” framing a pedestrian plaza and walkway that runs in a north-south direction, providing a visual and pedestrian connection from the proposed hotel site that lies to the south, and to the lake and the center of PA-5 that lies at the north.
- A small loop road that wraps around PA-4, and includes diagonal parking on both sides of the street. It further provides a drop-off lane that provides direct pedestrian access to the promenade around the lake and the retail village.
- Retail and food operators/concessions
- PA-5, including the following:
 - Initial partial build out of the Dining, Retail and Entertainment Village. Leasable space is envisioned to include a series of public amenities interlaced with stores, small shops, cafes, restaurants, and bistros.
 - A man-made lake, surrounded by a hardscape promenade with railing.
- The FEZ loop road will frame PA-5 like a “horseshoe” on its east, north, and west sides.

FUTURE PHASES:

- PA-6 occupies the southwestern most parcel, abutting residential lots to its west, and vacant land to its south. This parcel is intended to serve as expansion for the family entertainment offerings.
- PA-6A occupies the southwest corner of the street connection to McKinley Avenue. The City envisions it to become the Yosemite /South Sierra Nevada Visitors Center, along with a potential relocation site for the Manteca Convention and Visitors Bureau, as well as a small bus terminal and temporary bus parking for tours connecting to Yosemite and the Sierras.
- PA-7 flanks Daniels Street, to its northeast. It also flanks the FEZ loop road, to its west. The property is intended to be developed as an Adventure Zone with active and passive recreational facilities.
- PA-8 incorporates an Indoor All-season Sports & Exhibition Center, and will be located to the north of the FEZ loop road, between Parcels 2 & 7. It is bordered by the PG&E power line right-of-way to its north.
- PA-9 is also bordered by the PG&E power line right-of-way to its north. It abuts McKinley Avenue to its west, and is slated for FEZ expansion.
- PA-10 is a continuation of FEZ expansion, and it’s situated to the north of PA-9, to the north of the PG&E power line right-of-way.

- PA-11 is situated on a northwest axis from the heart of the FEZ, the lake, and is situated in the far northwest corner of the property, to the north of the PG&E power line right-of-way. The property is intended to be developed as sport field with spectator seating.
- PA-12 is also located to the north of the PG&E power line right-of-way. It spans the majority of the northern boundary of the overall property, abutting a boundary road with a set-aside landscape buffer, and then the WQCF to the north. The property is envisioned to serve as an outdoor sports zone.
- PA-13, PA-14, and PA-15 comprise the PG&E right-of-way that stretches diagonally across the property in a west/southwest- east/northeast direction. These planning areas are reserved strictly for shared parking for the entire FEZ property. Setbacks will be established to protect the PG&E towers.
- Future projected hotel expansions may include 200 hotel rooms; 76,000 sf indoor waterpark, 20,000 sf conference facility and 330 more parking stalls.

BUILD OUT AND PHASING

Construction will have several phases, depending on market conditions and the availability of financing. The projected timeframe for the construction is up to 15 years. Infrastructure extensions will be made, as needed, to service constructed portions of the project.

9. Project Public Agency Provided Infrastructure Facilities

A. EXISTING AND PLANNED UTILITIES & SUPPORTING PUBLIC SERVICE FACILITIES

The City of Manteca Public Works Department has jurisdiction over the project for services including sewage systems and treatment, storm water management, potable water, solid waste and recycling.

Sanitary Sewer

The City of Manteca Public Works Department has jurisdiction over the project. Services are provided by the Wastewater Quality Control Facility (WQCF), which lies directly north of the project site. Sewer facilities will be maintained by WQCF.

Treated sewer effluent from the WQCF may be used for irrigation purposes on the Manteca FEZ project. Irrigated areas include park settings, road medians and right of ways. The treated effluent may also be used for water features in the commercial areas of the project. Sewer mains, laterals, and other facilities such as pump stations would be designed according to current standards.

Ground Water

The area is characterized by a relatively high water table. The City envisions developing the lake as a distinct body of water that does not mix with ground water.

Storm Water Management

The City of Manteca is responsible for storm drain design, installation, operation and maintenance for development projects in the City. However, some structures and facilities are shared with South San Joaquin Irrigation District (SSJID). A portion of the project site will serve as a detention basin, by regulating the flow of storm water into the proposed lake, thus controlling runoff from site, due to the increase in impervious surfaces.

Prior to construction of the proposed 6-acre lake, detention ponds will be constructed on a temporary basis. This may include temporary use of super-pad areas that will be graded for future development. Otherwise, storm water will be collected and routed to the SSJID Drains and Laterals, which eventually reach the San Joaquin River. Existing open channel drains will be placed in underground piping under the new project road network where feasible.

Irrigation Water

The Water Quality Control Facility will provide tertiary-treated irrigation water.

Potable Water

The City of Manteca is the water service provider for the area. Water mains will be constructed within public streets and easements of the Manteca FEZ project. Water mains, laterals, and related facilities will be designed according to current standards. Water facilities will be maintained by the City of Manteca.

Electricity and Natural Gas

Pacific Gas & Electric Company (PG&E) provides natural gas and electricity service in Manteca. The property is bisected by a PG&E electric transmission line and right of way.

Telecommunications

Verizon provides land line telecommunications service in Manteca and would serve the project.

Solid Waste Management

Solid waste generated by the project would be collected at each commercial location and brought to centralized refuse and recycling storage locations. The City Public Works Department Solid Waste Division would be responsible for collecting and disposing of solid waste from the project.

B. SUPPORTING PUBLIC SERVICE FACILITIES - PUBLIC SAFETY/POLICE AND FIRE SERVICES

The City of Manteca Police Department is the local law enforcement entity that would serve the project. The Manteca Police Department currently operates on a four or five beat system. Service to the hotel/FEZ area would be enhanced and increased as needed, based upon calls for service trends and special events.

C. TRANSPORTATION, TRAFFIC, & STREETS

The project site currently has one vehicular access, via Daniels Street, approached in a westerly direction from Airport Way. Daniels Street may be extended in a westerly direction, across the property, ultimately to McKinley Avenue.

The City is also currently working with Caltrans to prepare conceptual designs for a new SR 120 interchange at McKinley Avenue. This would provide a second major freeway access point for the project.

The City further envisions the extension Milo Candini, in a northerly direction, connecting to a signalized intersection at Yosemite Avenue, which is the major east-west vehicular corridor through Manteca. This connection would provide a significant means of vehicular access from most local Manteca residents. This plan identifies additional streets that serve the project, once one arrives at the property. All streets will be designed to City standards and will be public streets.

D. SUSTAINABILITY

The developer plans to provide a responsible level of sustainable design practices in the development. This will include, but not be limited to, placement of solar photovoltaic panels on frames suspended above vehicular parking lots, thereby reducing heat sink, and providing shade for parked cars. The developer will also maximize the use of pavers, pervious pavement and other permeable surfaces throughout the site to minimize the impact on storm water systems.

E. MAINTENANCE AND OPERATIONS OF COMMON AREAS

A common area operating agreement shall be established to maintain parkways, internal roadways or other common open space, including hardscape and landscape, and other improvements where legally permissible. Funding for these activities may include a special services district that may collect fees from various vendors, users and public agencies as necessary to operate and maintain common facilities (parking, landscape) and events (similar to a tourism or business improvement district).

F. INFRASTRUCTURE FINANCING

The primary infrastructure systems will be sized to meet the demands created by build-out of the project. The City anticipates making use of available proceeds from existing redevelopment bonds to finance public infrastructure improvements, including necessary public roads, water, sewer, and storm water/flood control facilities.

Formation of one or more Community Facilities Districts (CFD) may be implemented for this project location. The objective in forming the CFD is to provide additional financing for public improvements associated with the project, supplementing funds available from former redevelopment bond proceeds.

10. Project Entitlements

The project consists of 3 components:

1) Rezone of all parcels, APN's 241-31-53, 241-31-44, 241-31-18, 241-31-32 and portions of APN 241-31-16, 241-30-48, 241-31-48, 241-30-62 and 241-30-61 from Public/Quasi Public (PQP) to Master Plan (MP). A Master Plan will be developed concurrently with the environmental document.

2) Large Lot Tentative Parcel Map, to promote the various phases of development the 187 acre site will be subdivided into large lots available for individual development. The large lot map will include approximately 19 parcels, which will roughly resemble the layout of the Planning Areas.

3) Site Plan Review for Phase 1 of the project, which will be constructed on 30 acres within the FEZ and includes various public visitor serving uses including a 500 room, 290,000 square foot hotel; a 85,000 square foot indoor waterpark; a 20,000 square foot conference facility; 37,500 square feet of restaurant and retail space. A future expansion area is also contemplated which would include 200 additional hotel rooms, a 76,000 square foot addition to the indoor water park, and an additional 20,000 square feet for conference facilities.

Phase 1 may also include the construction of two new baseball fields to the west of the existing Big League Dreams complex and the development of 11.8 acre PA-1, with new multi-purpose turf playfields. The plan has been conceptualized such that three International Soccer Fields and two U-12 size fields could be provided, along with one u.-a size field at the northeast corner of the parcel. Alternately, the International Soccer Fields could be divided into two U-12 youth soccer fields, yielding a total of eight U-12 play fields, with the one U-8 size field. In addition, minor facilities for public rest rooms, maintenance, storage and administrative offices may be provided on the parcel.

11. Project Alternatives

The exact alternatives that will be evaluated in the Draft EIR will be determined through the Notice of Preparation and Scoping Process. Through preliminary discussions, there are four alternatives to the proposed project that are being contemplated for evaluation in the Draft EIR. These include the following:

- **No Project (No Build) Alternative:** Under this alternative, development of the project site would not occur, and the project site would remain in its current existing vacant condition.
- **Alternative Location:** This alternative would address potential impacts associated with development of the project, as currently proposed by the applicant, at a location other than the currently proposed project site.
- **Reduced Project Alternative:** Under this alternative, the proposed project would be developed with the same amenities as described in the Project Description, but the area utilized for the amenities would be reduced.

- **Site Reconfiguration Alternative:** Under this alternative, the proposed project would be developed with the same amenities, and the same amount of development as described in the Project Description, but the site layout would be reconfigured.

12. Uses of the EIR and Required Agency Approvals

The City of Manteca will be the Lead Agency for the proposed project, pursuant to the State Guidelines for Implementation of the California Environmental Quality Act (CEQA), Section 15050.

This EIR will be used by the City of Manteca to take the following actions:

- Certification of the EIR
- Adoption of the Mitigation Monitoring and Reporting Program
- Approval of a Rezone of all parcels from Public/Quasi Public (PQP) to Master Plan (MP).
- Approval of a Large Lot Tentative Parcel Map for the 187 acre site to roughly resemble the layout of the Planning Areas.
- Approval of Site Plan for Phase 1 of the project (30 acres), which includes a 500 room, 290,000 square foot hotel; a 85,000 square foot indoor waterpark; a 20,000 square foot conference facility; and 37,500 square feet of restaurant and retail space.

The following agencies may be required to issue permits or approve certain aspects of the proposed project:

- SJCOG, Inc. (SJCOG) – Issuance of incidental take under the San Joaquin Multi-Species Habitat Conservation and Open Space Plan (SJMSCP).
- San Joaquin Valley Air Pollution Control District (SJVAPCD) - Approval of construction-related air quality permits pursuant to SJVAPCD rules and regulations.
- California Department of Fish and Game - Streambed Alteration Agreement pursuant to Section 1602 of the California Fish and Game Code;
- Central Valley Regional Water Quality Control Board (CVRWQCB) - Storm Water Pollution Prevention Plan (SWPPP) approval prior to construction activities pursuant to the Clean Water Act,
- Central Valley Regional Water Quality Control Board (CVRWQCB) – Permitting of State jurisdictional areas, including isolated wetlands pursuant to the Porter-Cologne Water Quality Act;
- United States Army Corps. Of Engineers – Permitting of federal jurisdictional areas pursuant to Section 404 of the Clean Water Act;

- Central Valley Regional Water Quality Control Board (CVRWQCB) – Water quality certification pursuant to Section 401 of the Clean Water Act.

Areas of Potential Impacts: All environmental topics identified in Appendix G of the State CEQA Guidelines require analysis within an EIR. The Draft EIR will examine the following: Aesthetics, Agricultural and Forest Resources, Air Quality, Biological Resources, Cultural Resources, Geology/Soils, Greenhouse Gases/Climate Change, Hazards and Hazardous Materials, Hydrology/Water Quality, Land Use/Planning, Mineral Resources, Noise, Population/Housing, Public Services, Recreation, Transportation/Circulation, Utilities, Cumulative Impacts, and Growth Inducing Impacts.

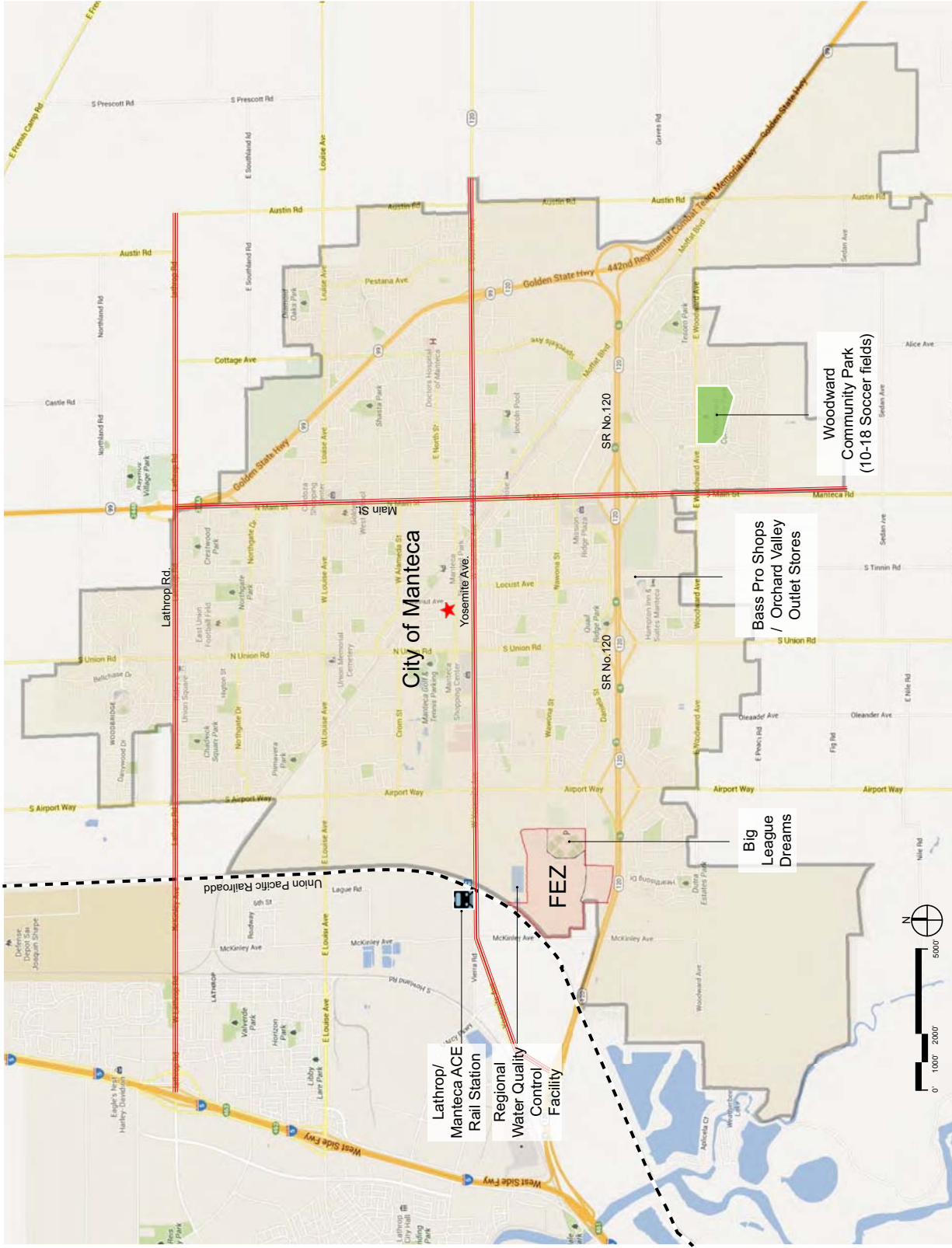
Initial Study: An Initial Study has not been prepared for this project. As noted above, each environmental topic identified in Appendix G of the State CEQA Guidelines requires analysis in an EIR.

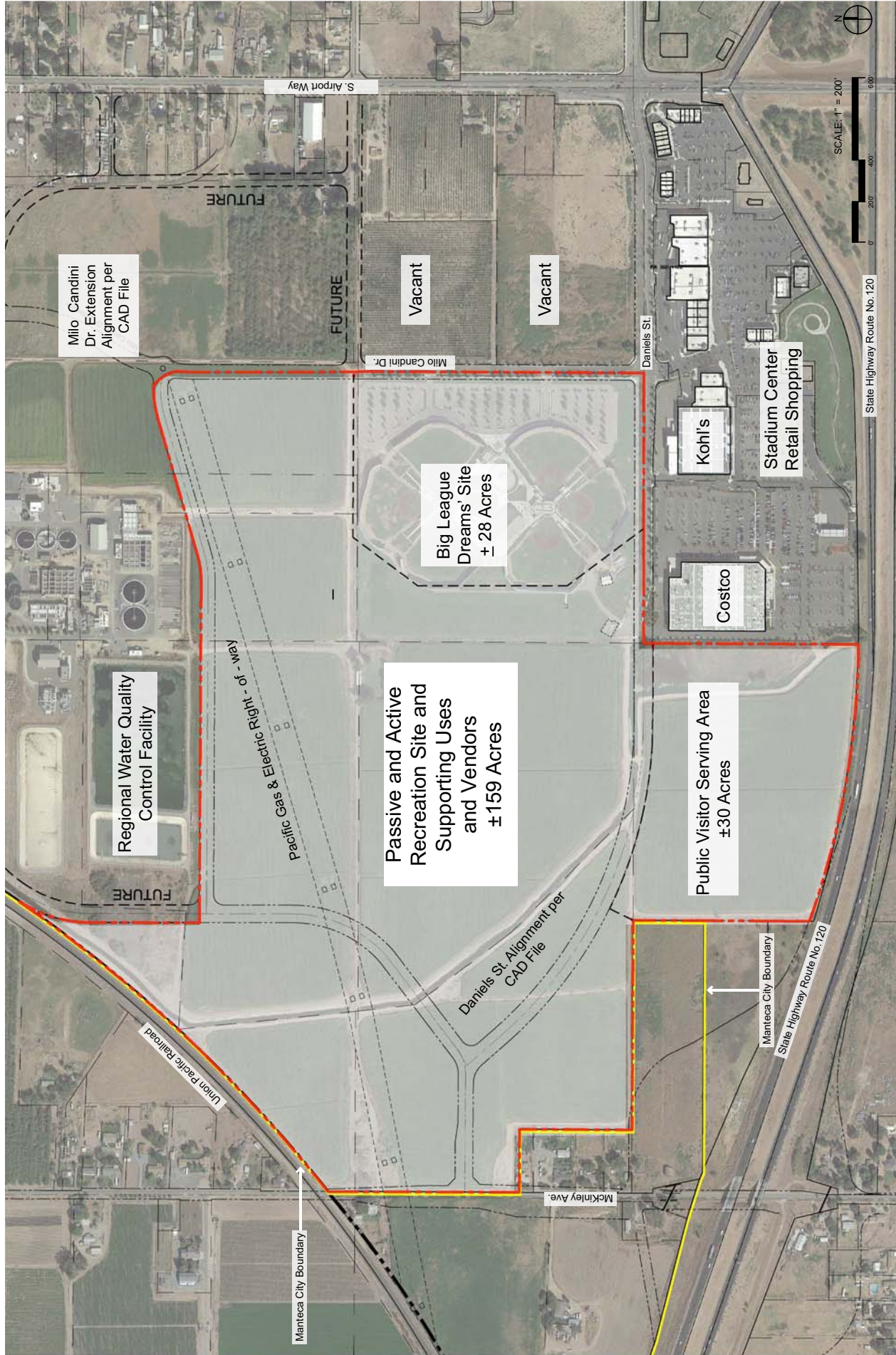
Date: _____

Signature: _____

Name/Title: _____

Phone/Email: _____





LOCAL MAP
FAMILY ENTERTAINMENT ZONE
MANTECA, CALIFORNIA
2013-08-01

EXHIBIT B



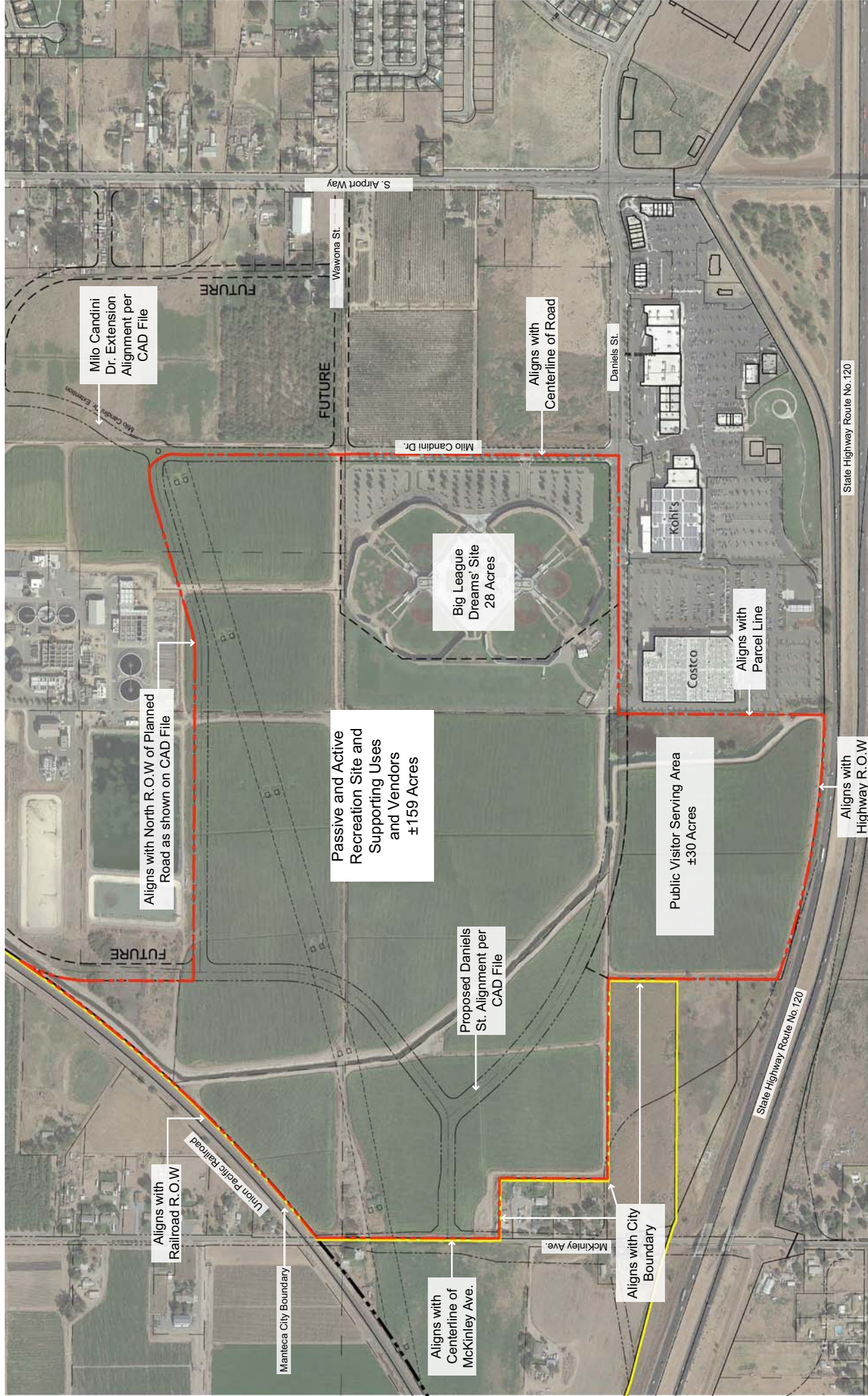
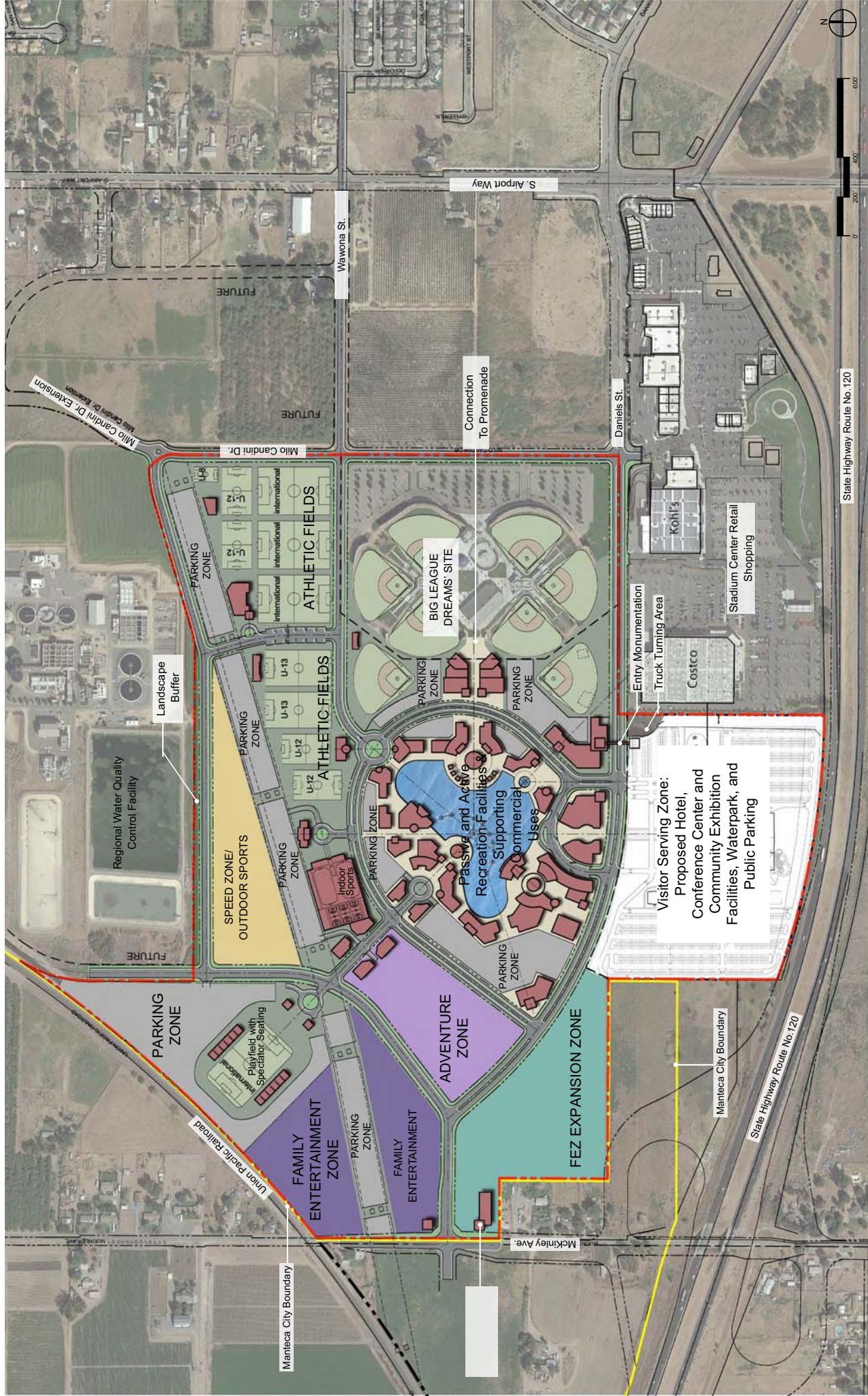


EXHIBIT C

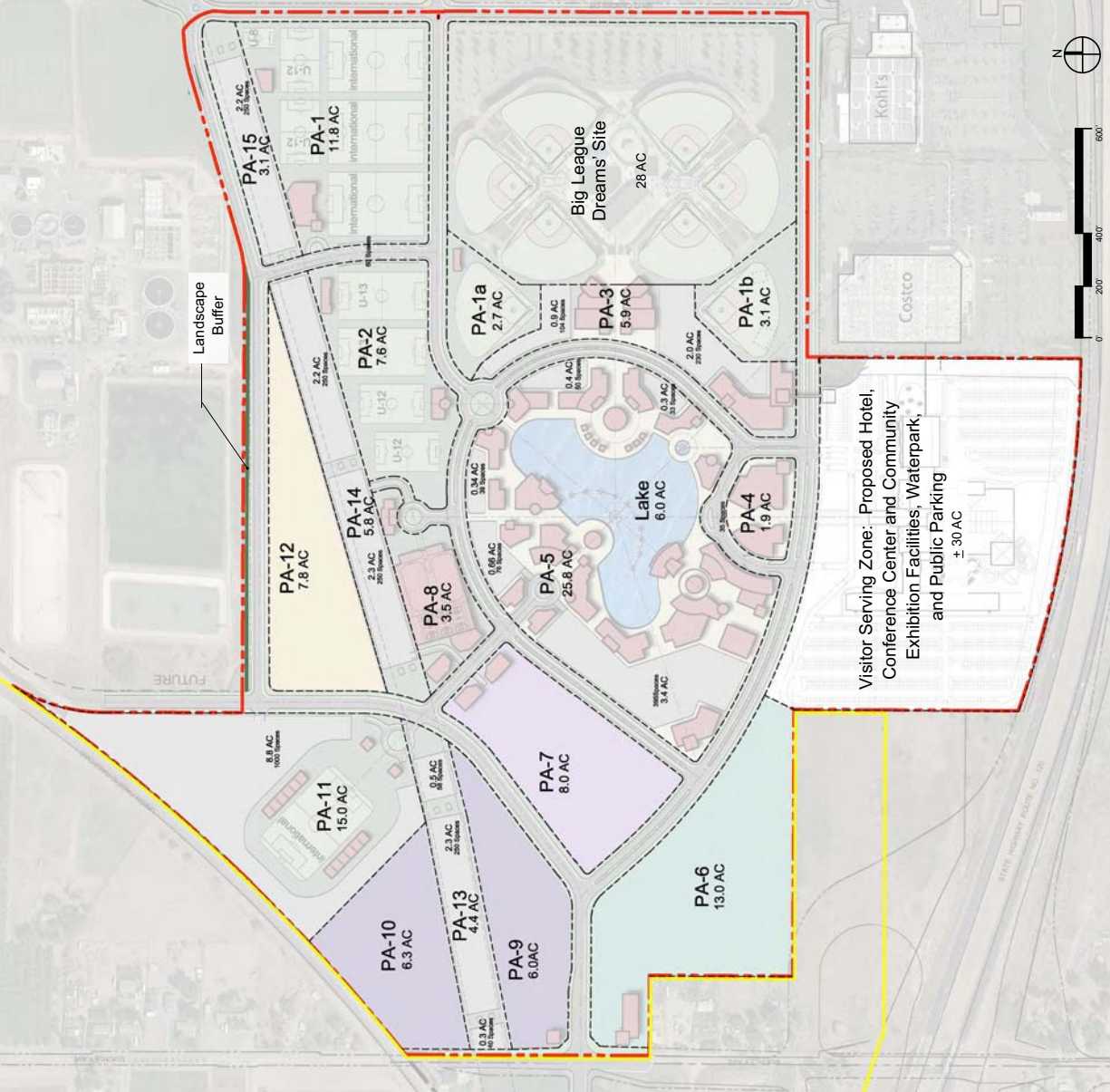
BOUNDARY ANALYSIS FAMILY ENTERTAINMENT ZONE MANTECA, CALIFORNIA 2013-06-01



CONCEPTUAL PLAN
FAMILY ENTERTAINMENT ZONE
MANTECA, CALIFORNIA
2013-08-01

EXHIBIT D





FEZ PLANNING AREA SUMMARY TABLE						
Area	Land Use	Gross Land Area (AC)	Parking Area (AC)	Net Developable Land Area (AC)	Building SF	Estimated Phasing
PA-1	Outdoor Sports Fields	11.80	0.26	11.54	5,000	2015
PA-1a	New Baseball / Softball Field	2.70	0.00	2.70	N.A.	2016
PA-1b	New Baseball / Softball Field	3.10	0.00	3.10	N.A.	2016
PA-2	Outdoor Sports Fields	7.60	0.26	7.34	5,000	2015
PA-3	Retail, Food & Beverage	5.90	2.90	3.00	77,000	2016-2018
PA-4	FEZ Plaza/Main Street	1.88	0.30	1.58	35,000	2016-2018
PA-5	Passive/Active Recreation and Commercial Support	25.80	5.10	14.70	400,000	2017-2022
PA-6	FEZ Expansion	13.00	3.25	9.75	20,000	2017-2022
PA-7	Adventure Zone	8.00	2.00	6.00	8,000	2017-2022
PA-8	Indoor Sports	3.50	0.00	3.50	25,000	2018-2020
PA-9	Family Entertainment	6.00	1.50	4.50	20,000	2018-2022
PA-10	Family Entertainment	6.30	1.58	4.73	20,000	2018-2023
PA-11	Playfield with Spectator Seating	15.00	8.80	6.20	10,000	2023-2025
PA-12	Speed Zone / Outdoor Sports	7.80	1.95	5.85	N.A.	2019-2022
PA-13	Power Line Easement/ Shared Parking	4.40	3.14	N.A.	N.A.	2019-2022
PA-14	Power Line Easement/ Shared Parking	5.80	4.50	N.A.	N.A.	2016-2020
PA-15	Power Line Easement/ Shared Parking	3.10	2.30	N.A.	N.A.	2015
FEZ Planning Area Totals		131.68	37.84	84.49	625,000	
Existing Big League Dreams Site		28.00	6.40	21.60	Existing	Completed
Proposed Hotel/Exhibition Facility Site		30.00	15.00	15.00	490,000	2016
Projected Hotel/Exhibition Expansion					212,000	2020
Roads / Right of Ways		25.32				2016-18
Totals		215.00	44.24	99.49	1,327,000	

Notes: 1.) Road widths shown indicate the right of way width
 2.) All numbers are approximate.
 3.) The developable FEZ land area includes the FEZ Planning Areas, the hotel & exhibition parcel and road rights of way, totaling approximately 187 acres.
 4.) Acreage for PA-5 is reduced by the passive lake feature, estimated at 6 acres.

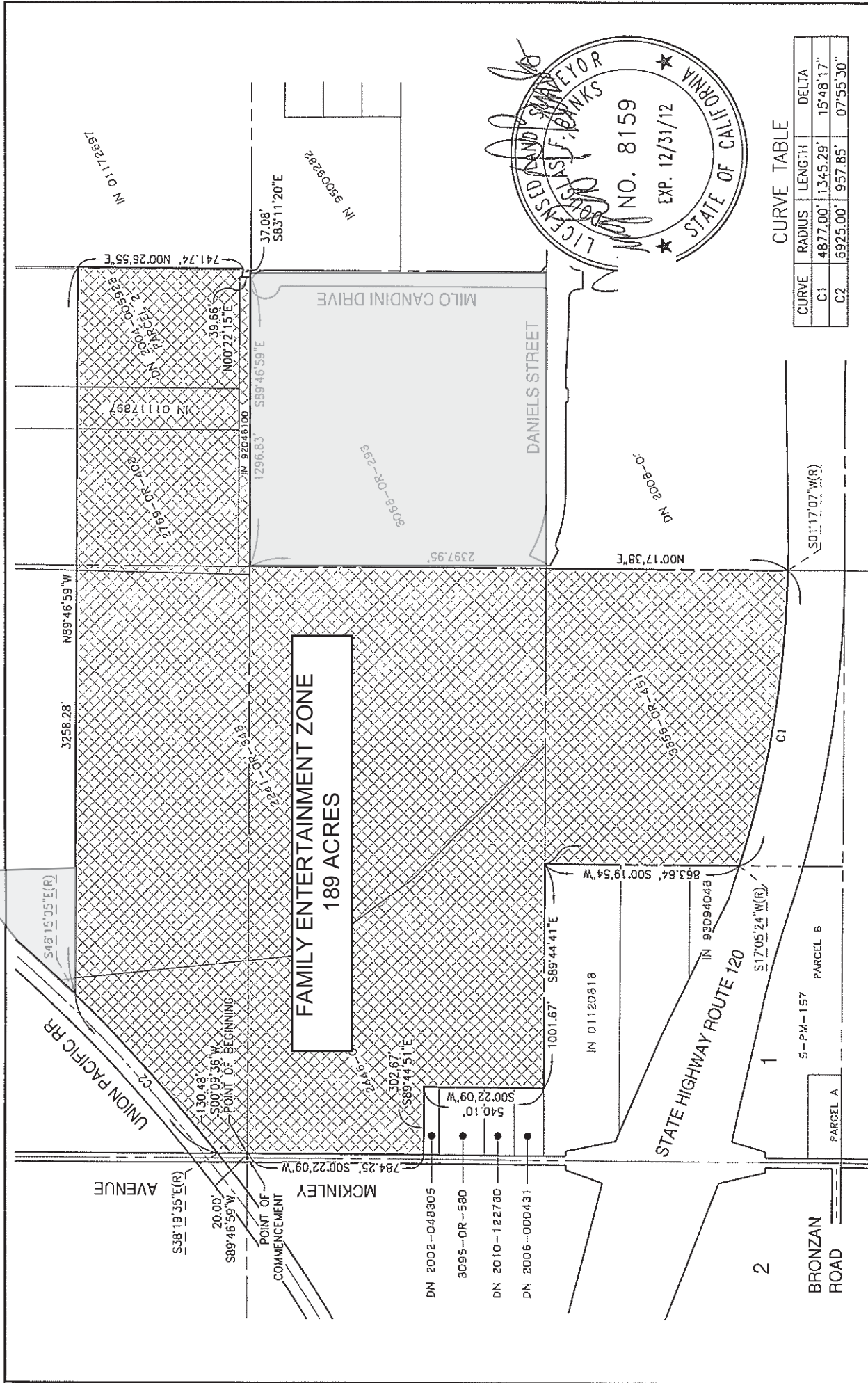
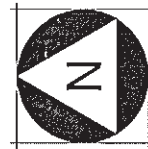


EXHIBIT "F"

FAMILY ENTERTAINMENT ZONE
BEING A PORTION OF SEC 1, T.S. 2 S, R 6 E, M.D.B.M.
CITY OF MANTECA, SAN JOAQUIN COUNTY, CALIFORNIA



mcr
ENGINEERING
www.mcreng.com

DATE: AUGUST, 2011

MCR ENGINEERING, INC.
1242 DUPONT COURT
MANTECA, CA 95336
TEL: (209) 239-6229
FAX: (209) 239-8839

DEPARTMENT OF TRANSPORTATION

P.O. BOX 2048 STOCKTON, CA 95201
(1976 E. CHARTER WAY/1976 E. DR. MARTIN
LUTHER KING JR. BLVD. 95205)
TTY: California Relay Service (800) 735-2929
PHONE (209) 941-1921
FAX (209) 948-7194



*Flex your power!
Be energy efficient!*

March 3, 2014

**10-SJ-120-PM 2.2
Manteca Family Entertainment Zone
SCH #2014022008**

Mr. Mark Meissner
City of Manteca
Community Development Department
Planning Division
1001 West Center Street
Manteca, CA 95337

Dear Mr. Meissner:

The California Department of Transportation (Department) appreciates the opportunity to review the Notice of Preparation (NOOP) for the Manteca Family Entertainment Zone draft Environmental Impact Report (EIR). This project is located north of 120 between Airport and McKinley. The Manteca Family Entertainment Zone includes recreational sport fields and building facilities.

Upon review of the project, the Department has the following comments:

The Department is requesting a Traffic Impact Study (TIS) to determine this proposed project's near-term and long-term impacts to State facilities – both existing and proposed – and to propose appropriate mitigation measures. The Department recommends that the study be prepared in accordance with the *Caltrans Guide for the Preparation of Traffic Impact Studies*, dated December 2002 (Guide) or the latest version. The Department is available to discuss assumptions, data requirements, study scenarios and analysis methodologies.

Additionally, in order to provide the most thorough review of the traffic forecast that is being developed for this proposed project, the Department recommends that the following information be provided in the TIS for documentation of methodology and assumptions:

1. Project Execution Summary and Project Description
2. Existing Data Collection
 - Vicinity map showing the existing traffic study locations
 - Existing intersection turning movement traffic data for AM and PM peak hour
 - Existing mainline and ramp traffic data in AADT and AM and PM peak hour

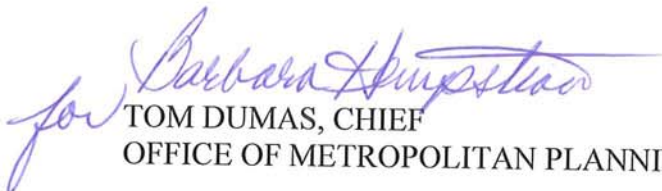
3. Transportation Model
 - Provide travel demand model information
 - Air quality model information
4. Travel Forecasting
 - Vicinity map showing the future configuration
 - Future intersection turning movement traffic data for AM and PM peak hour
 - Future mainline and ramp traffic data in AADT and AM and PM peak hour
 - Trip generation and trip distribution information
 - Please show how special events held at the Manteca Family Entertainment Zone will affect traffic circulation
 - Please include the size of the athletic fields
5. Planning and RTP Conformity Information
 - RTP/General Plan Assumptions
 - Other plan(Specific Plan, Community Plan, Etc.) assumptions
 - Programmed or Tier 1 projects

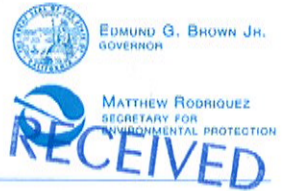
Please submit the scope of work to the Department for review and comment prior to start of work on the TIS to help ensure that a quality TIS is prepared.

Upon completion of the TIS, please provide a hard copy along with a disk containing the complete electronic data files (Synchro & or 8, Sim Traffic, Traffix 7.9, HCS, etc.) for our review and comment. This will help expedite the Department's review.

If you have any questions, please contact Barbara Hempstead at (209) 948-3909 (e-mail: Barbara_Hempstead@dot.ca.gov) or myself at (209) 941-1921.

Sincerely,


for TOM DUMAS, CHIEF
OFFICE OF METROPOLITAN PLANNING



Central Valley Regional Water Quality Control Board

25 February 2014

Mark Meissner
City of Manteca
1001 West Center Street
Manteca, CA 95337

CERTIFIED MAIL
7013 1710 0002 3644 0960

COMMENTS TO NOTICE OF PREPARATION FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, MANTECA FAMILY ENTERTAINMENT ZONE PROJECT, SCH# 2014022008, SAN JOAQUIN COUNTY

Pursuant to the State Clearinghouse's 5 February 2014 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Notice of Preparation for the Environmental Impact Report* for the Manteca Family Entertainment Zone Project, located in San Joaquin County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits¹

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/.

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 97-03-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916) 557-5250.

¹ Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACOE permit, or any other federal permit, is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

Waste Discharge Requirements

If USACOE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project will require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/help/business_help/permit2.shtml.

Low or Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Dewatering and Other Low Threat Discharges to Surface Waters* (Low Threat General Order) or the General Order for *Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water* (Limited Threat General Order). A complete application must be submitted to the Central Valley Water Board to obtain coverage under these General NPDES permits.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0074.pdf

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0073.pdf

If you have questions regarding these comments, please contact me at (916) 464-4684 or tcleak@waterboards.ca.gov.

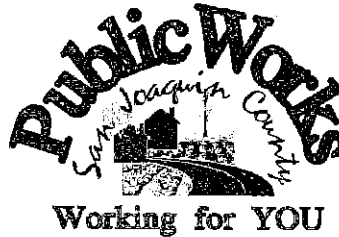
A handwritten signature in black ink, appearing to read "Trevor Cleak". The signature is fluid and cursive, with a long horizontal stroke at the end.

Trevor Cleak
Environmental Scientist

cc: State Clearinghouse Unit, Governor's Office of Planning and Research, Sacramento



THOMAS M. GAU
DIRECTOR



P. O. BOX 1810 - 1810 E. HAZELTON AVENUE
STOCKTON, CALIFORNIA 95201
(209) 468-3000 FAX (209) 468-2999
www.sjgov.org/pubworks

FRITZ BUCHMAN
DEPUTY DIRECTOR

MICHAEL SELLING
DEPUTY DIRECTOR

JIM STONE
DEPUTY DIRECTOR

ROGER JANES
BUSINESS ADMINISTRATOR

March 3, 2014

Mark Meissner, Planning Manager
Manteca Community Development Department
Planning Division
1001 West Center Street
Manteca, California 95337

SUBJECT: NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR
THE MANTECA FAMILY ENTERTAINMENT ZONE

Dear Mr. Meissner:

The San Joaquin County Department of Public Works has reviewed the Notice of Preparation for the above referenced project and has no comments at this time. However, the County does request to be included on the circulation list for any additional project documents.

Thank you for the opportunity to review and comment. Should you have questions please contact me at aspitzer@sjgov.org or (209) 468-8494.

Sincerely,

AMY SPITZER
Assistant Planner

AS:mh

c: Firoz Vohra, Senior Engineer



S J C O G, Inc.

555 East Weber Avenue • Stockton, CA 95202 • (209) 235-0600 • FAX (209) 235-0438

San Joaquin County Multi-Species Habitat Conservation & Open Space Plan (SJMSCP)

**SJMSCP RESPONSE TO LOCAL JURISDICTION (RTLJ)
ADVISORY AGENCY NOTICE TO SJCOG, Inc.**

To: Mark Meissner, City of Manteca, Community Development Department
From: Laurel Boyd, SJCOG, Inc.
Date: February 7, 2014

Local Jurisdiction Project Title: NOP of an EIR and Scoping Meeting for the Manteca Family Entertainment Zone Project

Local Jurisdiction Project Number: N/A

Total Acres to be converted from Open Space Use: 187 acres

Habitat Types to be Disturbed: Agricultural and Urban Habitat Land

Species Impact Findings: Findings to be determined by SJMSCP biologist.

SJCOG, Inc. has reviewed the Notice of Preparation of an Environmental Impact Report and Scoping Meeting for the Manteca Family Entertainment Zone project. The Notice of Preparation is to notify public agencies and the general public that the City of Manteca, as the Lead Agency, will prepare an EIR for the Manteca Family Entertainment Zone. The City of Manteca is interested in the input and/or comments of public agencies and the general public as to scope and content of the environmental information that is germane to the agencies' statutory responsibilities in connection with the proposed project, and public input.

On February 20, 2014, the City of Manteca will conduct a public scoping meeting to solicit input and comments from public agencies and the general public on the proposed project and scope of the Environmental Impact Report (EIR). This meeting will be held at Administration Conference Room at the Manteca City Hall from 2:00 to 3:00 pm.

The project consists of developing a plan for a comprehensive multi-purpose public use zone called the Manteca Family Entertainment Zone (FEZ). The Plan will encompass multiple projects and parcels that in the aggregate will provide an extensive park and recreation complex featuring 189 acres of new and existing recreational, park, water, sports and other leisure amenities. The FEZ planning area will be open and accessible to the general public, and is designed to serve the state, region, and the Manteca community as a multipurpose recreation center and public park facility. The project site is located to the north and west of the Stadium Shopping Center, to the west of Milo Candini Drive, to the east of McKinley Avenue, to the south of the City of Manteca Wastewater Quality Control Facility (WQCF), and to the north of State Route 120 (APN: 241-310-53, -44, -18, -32, -16, -48, 241-300-48, -61, -62).

The City of Manteca is a signatory to San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). Participation in the SJMSCP satisfies requirements of both the state and federal endangered species acts, and ensures that the impacts are mitigated below a level of significance in compliance with the California Environmental Quality Act (CEQA). [The LOCAL JURISDICTION retains responsibility for ensuring that the appropriate Incidental Take Minimization Measure are properly implemented and monitored and that appropriate fees are paid in compliance with the SJMSCP.](#) Although participation in the SJMSCP is voluntary, Local Jurisdiction/Lead Agencies should be aware that if project applicants choose against participating in the SJMSCP, they will be required to provide alternative mitigation in an amount and kind equal to that provided in the SJMSCP.

It should be noted that two important federal agencies (U.S. Army Corps of Engineers and the California Regional Water Quality Control Board) have not issued permits to the SJCOG and so payment of the fee to use the SJMSCP will not modify requirements that could be imposed by these two agencies. Potential waters of the United States [pursuant to Section 404 Clean Water Act] are believed to occur on the project site. It may be prudent to obtain a preliminary wetlands map from a qualified consultant. If waters of the United States are confirmed on the project site, the Corps and the Regional Water Quality Control Board (RWQCB) would have regulatory authority over those

mapped areas [pursuant to Section 404 and 401 of the Clean Water Act respectively] and permits would be required from each of these resource agencies prior to grading the project site.

This Project is subject to the SJMSCP. Per requirements of the SJMSCP, this project must seek coverage due to required Army Corp permitting and Section 7 consultation. This project is subject to a case-by-case review. This can be a 90 day process and it is recommended that the project applicant contact SJMSCP staff as early as possible. It is also recommended that the project applicant obtain an information package. <http://www.sjcog.org> After this project is approved by the Habitat Technical Advisory Committee and the SJCOG Inc. Board, the following process must occur to participate in the SJMSCP:

- Schedule a SJMSCP Biologist to perform a pre-construction survey ***prior to any ground disturbance***
- SJMSCP Incidental take Minimization Measures and mitigation requirement:
 1. Incidental Take Minimization Measures (ITMMs) will be issued to the project and must be signed by the project applicant prior to any ground disturbance but no later than six (6) months from receipt of the ITMMs. If ITMMs are not signed within six months, the applicant must reapply for SJMSCP Coverage. Upon receipt of signed ITMMs from project applicant, SJCOG, Inc. staff will sign the ITMMs. This is the effective date of the ITMMs.
 2. Under no circumstance shall ground disturbance occur without compliance and satisfaction of the ITMMs.
 3. Upon issuance of fully executed ITMMs and prior to any ground disturbance, the project applicant must:
 - a. Post a bond for payment of the applicable SJMSCP fee covering the entirety of the project acreage being covered (the bond should be valid for no longer than a 6 month period); or
 - b. Pay the appropriate SJMSCP fee for the entirety of the project acreage being covered; or
 - c. Dedicate land in-lieu of fees, either as conservation easements or fee title; or
 - d. Purchase approved mitigation bank credits.
 4. Within 6 months from the effective date of the ITMMs or issuance of a building permit, whichever occurs first, the project applicant must:
 - a. Pay the appropriate SJMSCP for the entirety of the project acreage being covered; or
 - b. Dedicate land in-lieu of fees, either as conservation easements or fee title; or
 - c. Purchase approved mitigation bank credits.

Failure to satisfy the obligations of the mitigation fee shall subject the bond to be called.

- Receive your Certificate of Payment and release the required permit

If you have any questions, please call (209) 235-0600.



S J C O G , I n c .

San Joaquin County Multi-Species Habitat Conservation & Open Space Plan

555 East Weber Avenue • Stockton, CA 95202 • (209) 235-0600 • FAX (209) 235-0438

SJMSCP HOLD

TO: Local Jurisdiction: Community Development Department, Planning Department, Building Department, Engineering Department, Survey Department, Transportation Department,
Other: _____

FROM: Laurel Boyd, SJCOG, Inc.

**DO NOT AUTHORIZE SITE DISTURBANCE
DO NOT ISSUE A BUILDING PERMIT
DO NOT ISSUE _____ FOR THIS PROJECT**

The landowner/developer for this site has requested coverage pursuant to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). In accordance with that agreement, the Applicant has agreed to:

- 1) SJMSCP Incidental Take Minimization Measures and mitigation requirement:
 1. Incidental Take Minimization Measures (ITMMs) will be issued to the project and must be signed by the project applicant prior to any ground disturbance but no later than six (6) months from receipt of the ITMMs. If ITMMs are not signed within six months, the applicant must reapply for SJMSCP Coverage. Upon receipt of signed ITMMs from project applicant, SJCOG, Inc. staff will sign the ITMMs. This is the effective date of the ITMMs.
 2. Under no circumstance shall ground disturbance occur without compliance and satisfaction of the ITMMs.
 3. Upon issuance of fully executed ITMMs and prior to any ground disturbance, the project applicant must:
 - a. Post a bond for payment of the applicable SJMSCP fee covering the entirety of the project acreage being covered (the bond should be valid for no longer than a 6 month period); or
 - b. Pay the appropriate SJMSCP fee for the entirety of the project acreage being covered; or
 - c. Dedicate land in-lieu of fees, either as conservation easements or fee title; or
 - d. Purchase approved mitigation bank credits.
 4. Within 6 months from the effective date of the ITMMs or issuance of a building permit, whichever occurs first, the project applicant must:
 - a. Pay the appropriate SJMSCP for the entirety of the project acreage being covered; or
 - b. Dedicate land in-lieu of fees, either as conservation easements or fee title; or
 - c. Purchase approved mitigation bank credits.

Failure to satisfy the obligations of the mitigation fee shall subject the bond to be called.

Project Title: NOP of an EIR and Scoping Meeting for the Manteca Family Entertainment Zone Project

Applicant: Mark Meissner, City of Manteca, Community Development Department

Assessor Parcel #s: 241-310-53, -44, -18, -32, -16, -48, 241-300-48, -61, -62

T _____, R _____, Section(s): _____

Local Jurisdiction Contact: Mark Meissner

The LOCAL JURISDICTION retains responsibility for ensuring that the appropriate Incidental Take Minimization Measures are properly implemented and monitored and that appropriate fees are paid in compliance with the SJMSCP.

March 4, 2014

Mark Meissner
City of Manteca
Community Development Department
Planning Division
1001 West Center Street
Manteca, CA 95337

Project: Manteca Family Entertainment Zone (FEZ Project) - SCH # 2014022008

District CEQA Reference No: 20140077

Dear Mr. Meissner:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the Notice of Preparation (NOP) for the Manteca Family Entertainment Zone (FEZ Project). The proposed project consists of three (3) components: (1) the rezone of all parcels (APNs 241-31-53, 241-31-44, 241-31-18, 241-31-32 and portions of 241-31-16, 241-30-48, 241-31-48, 241-30-62 and 241-30-61) from Public/Quasi Public (PQP) to Master Plan (MP), (2) a large lot tentative parcel map for the 187 acre site, and (3) a site plan review for Phase 1 of the Project. The land is owned entirely by the City of Manteca. Development of the Family Entertainment Zone (FEZ) will include several separate distinct projects constructed in phases over an estimated period up to 15 years. Phases of development are expected to include construction of recreation facilities, ball fields, retail/commercial, and dining facilities. The initial phase is anticipated to include a 500 room hotel, an indoor waterpark, multiple recreational ball fields, and commercial facilities. The FEZ property is located on the western edge of Manteca, to the north of State Route 120 and the Stadium Shopping Center, between McKinley Avenue on its west and Airport Way on its east. The District offers the following comments:

Emissions Analysis

- 1) The District is currently designated as extreme nonattainment for the 8-hour ozone standard, attainment for PM10 and CO, and nonattainment for PM2.5 for the federal

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: 661-392-5500 FAX: 661-392-5585

air quality standards. At the state level, the District is designated as nonattainment for the 8-hour ozone, PM10, and PM2.5 air quality standards. The District recommends that the Air Quality section of the Environmental Impact Report (EIR) include a discussion of the following impacts:

- a) **Criteria Pollutants:** Project related criteria pollutant emissions should be identified and quantified. The discussion should include existing and post-project emissions.
 - i) **Construction Emissions:** Construction emissions are short-term emissions and should be evaluated separate from operational emissions. The District recommends preparation of an Environmental Impact Report (EIR) if annual construction emissions cannot be reduced or mitigated to below the following levels of significance: 10 tons per year of oxides of nitrogen (NOx), 10 tons per year of reactive organic gases (ROG), or 15 tons per year particulate matter of 10 microns or less in size (PM10).
 - (1) *Recommended Mitigation:* To reduce impacts from construction related exhaust emissions, the District recommends feasible mitigation for the project to utilize off-road construction fleets that can achieve fleet average emissions equal to or cleaner than the Tier II emission standards, as set forth in §2423 of Title 13 of the California Code of Regulations, and Part 89 of Title 40 Code of Federal Regulations. This can be achieved through any combination of uncontrolled engines and engines complying with Tier II and above engine standards.
 - ii) **Operational Emissions:** Permitted (stationary sources) and non-permitted (mobile sources) sources should be analyzed separately. The District recommends preparation of an Environmental Impact Report (EIR) if the sum of annual permitted and non-permitted emissions cannot be reduced or mitigated to below the following levels of significance: 10 tons per year of oxides of nitrogen (NOx), 10 tons per year of reactive organic gases (ROG), or 15 tons per year particulate matter of 10 microns or less in size (PM10).
 - (1) *Recommended Mitigation:* Project related impacts on air quality can be reduced through incorporation of design elements, for example, that increase energy efficiency, reduce vehicle miles traveled, and reduce construction exhaust related emissions. However, design elements and compliance with District rules and regulations may not be sufficient to reduce project related impacts on air quality to a less than significant level. Another example of a feasible mitigation measure is the mitigation

of project emissions through a Voluntary Emission Reduction Agreement (VERA). The VERA is an instrument by which the project proponent provides monies to the District, which is used by the District to fund emission reduction projects that achieve the reductions required by the lead agency. District staff is available to meet with project proponents to discuss a VERA for specific projects. For more information, or questions concerning this topic, please call District Staff at (559) 230-6000.

- iii) **Recommended Model:** Project related criteria pollutant emissions should be identified and quantified. Emissions analysis should be performed using CalEEMod (**C**alifornia **E**mission **E**stimator **M**odel), which uses the most recent approved version of relevant Air Resources Board (ARB) emissions models and emission factors. CalEEMod is available to the public and can be downloaded from the CalEEMod website at: www.caleemod.com.
- b) **Nuisance Odors:** The project should be evaluated to determine the likelihood that the project would result in nuisance odors. Nuisance odors are subjective, thus the District has not established thresholds of significance for nuisance odors. Nuisance odors may be assessed qualitatively taking into consideration of project design elements and proximity to off-site receptors that potentially would be exposed objectionable odors.
- c) **Health Impacts:** Project related health impacts should be evaluated to determine if emissions of toxic air contaminants (TACs) will pose a significant health risk to sensitive receptors. TACs are defined as air pollutants that may cause or contribute to an increase in risk exposure to the surrounding public. The most common source of TACs can be attributed to diesel exhaust that is emitted from both stationary and mobile sources. A health impact assessment may require a screening or even a refined health risk assessment (HRA).

Prior to conducting an HRA, an applicant may perform a prioritization on all sources of emissions to determine if it is necessary to conduct a refined assessment. A prioritization is a screening assessment used to identify projects that may have a potential to significantly impact the public. If the project has a prioritization score of 10 or more, the project would exceed the District's significance threshold and a refined HRA should be performed.

If a refined HRA is to be performed, it is recommended that the project proponent contact the District to review the proposed modeling approach. The project would be considered to have a significant health risk if the HRA demonstrates that

project related health impacts assessment would exceed the District's significance threshold of 10 in a million for cancer and 1.0 for acute and chronic hazard indices.

More information on TACs, prioritizations and HRAs can be obtained by:

- E-mailing inquiries to: hramodeler@valleyair.org; or
- Visiting the District's website at:

http://www.valleyair.org/busind/pto/Tox_Resources/AirQualityMonitoring.htm.

2) In addition to the discussions on potential impacts identified above, the District recommends the EIR also include the following discussions:

- a) A discussion of the methodology, model assumptions, inputs and results used in characterizing the project's impact on air quality. To comply with CEQA requirements for full disclosure, the District recommends that the modeling outputs be provided as appendices to the EIR. The District further recommends that the District be provided with an electronic copy of all the files used to develop the modeling outputs.
- b) A discussion of the components and phases of the project and the associated emission projections, including ongoing emissions from each previous phase.
- c) A discussion of project design elements and mitigation measures, including characterization of the effectiveness of each mitigation measure incorporated into the project.
- d) A discussion of whether the project would result in a cumulatively considerable net increase of any criteria pollutant or precursor for which the San Joaquin Valley Air Basin is in non-attainment. More information on the District's attainment status can be found online by visiting the District's website at:

<http://valleyair.org/aqinfo/attainment.htm>.

District Rules and Regulations

- 3) The proposed project may be subject to District rules and regulations, including: Regulation VIII (Fugitive PM₁₀ Prohibitions), Rule 4102 (Nuisance), and Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). Per the NOP, a mobile home structure is located on the project site. In the event an existing building will be renovated, partially demolished or removed, the project may

be subject to District Rule 4002 (National Emission Standards for Hazardous Air Pollutants). If you have any questions concerning asbestos related requirements, please contact the District's Compliance Division at (209) 557-6400.

More information regarding asbestos related requirements can be obtained by:

- Visiting the District's website at <http://www.valleyair.org/busind/comply/asbestosbuln.htm> for information on asbestos requirements for demolitions, or
- Visiting the District's website at http://www.valleyair.org/busind/comply/compliance_assistance_bulletins.htm for a copy of the asbestos compliance bulletin

- 4) Based on information provided to the District, the proposed project would exceed the applicability threshold within District Rule 9510 (Indirect Source Review) of 2,000 square feet of commercial space and 20,000 square feet of recreational space. Therefore, per section 2.1 of the rule, the District concludes that the proposed project is subject to District Rule 9510.

District Rule 9510 is intended to reduce a project's impact on air quality through project design elements or mitigate its impact by payment of applicable off-site mitigation fees. Any applicant subject to District Rule 9510 is required to submit an Air Impact Assessment Application (AIA) to the District no later than applying for final discretionary approval and to pay any applicable off-site mitigation fees before issuance of the first grading / building permit, whichever comes first. Information on how to comply with District Rule 9510 can be found online at <http://www.valleyair.org/ISR/ISRHome.htm>.

The District recommends that demonstration of compliance with District Rule 9510, including payment of all applicable fees before issuance of the first grading / building permit be made a condition of project approval.

- 5) The above list of rules is neither exhaustive nor exclusive. To identify other District rules or regulations that apply to this project or to obtain information about District permit requirements, the applicant is strongly encouraged to contact the District's Small Business Assistance (SBA) Office at (209) 557-6446.

More information regarding compliance with District rules and regulation can be obtained by:

- Visiting the District's website at <http://www.valleyair.org/rules/1ruleslist.htm> for a complete listing of all current District rules and regulation

- Visiting the District's website at <http://www.valleyair.org/busind/comply/PM10/compliance PM10.htm> for information on controlling fugitive dust emissions

6) The District recommends that a copy of the District's comments be provided to the project proponent.

If you have any questions or require further information, please contact Georgia Stewart by phone at (559) 230-5937 or by e-mail at georgia.stewart@valleyair.org.

Sincerely,

David Warner
Director of Permit Services



For: Arnaud Marjollet
Permit Services Manager

DW: gs

NOTICE OF PREPARATION – RECIRCULATION

Recirculated Notice of Preparation of an Environmental Impact Report and Scoping Meeting

Date: November 14, 2014

Subject: Recirculated - Notice of Preparation of an Environmental Impact Report and Scoping Meeting for Manteca Family Entertainment Zone

To: State Clearinghouse
State Responsible Agencies
State Trustee Agencies
Other Public Agencies
Organizations and Interested Persons

Lead Agency: Rochelle Henson, Senior Planner
Manteca Community Development Department, Planning Division
1001 West Center Street
Manteca, CA 95337
(209) 456-8516

Reason for Recirculation: The City initially circulated an NOP for the above referenced project for public comment on February 4, 2014 through March 5, 2014. The City also held a public scoping meeting on February 20, 2014. The City received five NOP comments from the following agencies: California Department of Transportation, Central Valley Regional Water Quality Control Board, San Joaquin County Public Works Department, San Joaquin Council of Governments, and the San Joaquin Valley Air Pollution Control District. Since the initial circulation of the NOP, the project boundary has been reduced, more Project details have become available, and the Project is now much more refined. Based on these changes the City has determined that they should recirculate an NOP with the current Project Description as refined/modified. The entire updated Project Description is attached as Appendix A to this NOP.

Notice of Preparation: This is to notify public agencies and the general public that the City of Manteca, as the Lead Agency, will prepare an EIR for the Manteca Family Entertainment Zone. The City of Manteca is interested in the input and/or comments of public agencies and the general public as to the scope and content of the environmental information that is germane to the agencies' statutory responsibilities in connection with the proposed project, and public input. Responsible/trustee agencies will need to use the EIR prepared by the City of Manteca when considering applicable permits, or other approvals for the proposed project. All comments that were provided on the initial NOP remain part of the administrative record for the Project

and will be appropriately addressed in the EIR with any new comments that are received during the recirculated NOP public comment period; however, any agency that provided comment on the initial NOP is free to provide new or additional comments.

Comment Period: Consistent with the time limits mandated by State law, your input, comments or responses must be received in writing and sent at the earliest possible date, but not later than 5:00 p.m., December 15, 2014.

Comments/Input: Please send your comments/input (including the name for a contact person in your agency) to: Attn: Rochelle Henson, Senior Planner at the City of Manteca, 1001 West Center Street, Manteca, CA 95337.

Scoping Meeting: On December 3, 2014 the City of Manteca will conduct a public scoping meeting to solicit input and comments from public agencies and the general public on the proposed project and scope of the Environmental Impact Report (EIR). This meeting will be held at Administration Conference Room at the Manteca City Hall from 2 to 3 p.m.

This meeting will be an open house format and interested parties may drop in to review the proposed project exhibits and submit written comments at any time between 2 to 3 p.m. Representatives from the City of Manteca and the EIR consultant will be available to address questions regarding the EIR process and scope. Members of the public may provide written comments throughout the meeting.

If you have any questions regarding the scoping meeting, contact Rochelle Henson, Senior Planner at (209) 456-8516 or rhenson@ci.manteca.ca.us.

Project Title: Manteca Family Entertainment Zone

Project Location: The Project site is located in the City of Manteca, San Joaquin County. More specifically, the Project site is located to the north and west of the Stadium Shopping Center, to the west of Milo Candini Drive, to the east of McKinley Avenue, to the south of the City of Manteca Wastewater Quality Control Facility (WQCF), and to the north of State Route 120.

The project site is located on the Lathrop, California, USGS 7.5-minute quadrangle, Township 2 South, Range 6 East. The UTM coordinates for the center point of the project site are 652688.47536 W, 4183417.94368 N (zone 10N, NAD 83, meters). The Lat/Long coordinates are 37.7853 N, -121.2660 W (WGS 84, decimal degrees).

The Project site is within the City's Sphere of Influence and General Project site and has been identified by the City of Manteca to receive services from the City in the 2008 Municipal Services Review.

Big League Dreams ballpark is located on the eastern side of, and within, the Project site. The 28-acre site is fully developed with six replica ballparks, an indoor soccer facility, two restaurants and other supporting facilities all of which are open to the public and operated by private sector parties pursuant to ground leases.

Topographic features include level agricultural fields, an irrigation canal, and wetland areas. Elevation ranges from approximately 20 feet to 25 feet above mean sea level (MSL). The agricultural fields are currently used for land application of treated effluent from the Water Quality Control Facility (WQCF).

The Project site includes the following Assessor's Parcel Numbers (APN): 241-31-53, 241-31-44, 241-31-18, 241-31-32 and portions of APN 241-31-16, 241-30-48, 241-31-48, 241-30-62 and 241-30-61. (Figure 2-5).

Project Description: See the Appendix A for a detailed Project Description.

Project Alternatives: The exact alternatives that will be evaluated in the Draft EIR will be determined through the Notice of Preparation and Scoping Process. Through preliminary discussions, there are three alternatives to the proposed project that are being contemplated for evaluation in the Draft EIR. These include the following:

- **No Build Alternative:** Under this alternative, development of the Project site would not occur, and the Project site would remain in its current condition.
- **Reduced Project Alternative:** Under this alternative, the Project site would be developed with the same components as described in the Project Description, but the area utilized for the industrial and commercial uses would be reduced.
- **Agriculture Protection Alternative:** Under this alternative, the proposed Project would be developed in such a way to protect those lands currently identified as prime farmland and farmland of statewide importance.

The City of Manteca has been considering alternative locations early in the public scoping process. The City's consideration of alternative locations for the project included a review of previous land use planning and environmental documents in Manteca including the General Plan. The City found that there are no feasible alternative locations that exist within the City's Sphere of Influence with the appropriate size and characteristics that would meet the basic project objectives and avoid or substantially lessen a significant effect. The City determined that alternative locations outside the Sphere of Influence would not be feasible because an expansion of the Sphere of Influence would induce unplanned growth and cause impacts greater than development on the proposed location. For these reasons, the City of Manteca determined that there are no feasible alternative locations.

Areas of Potential Impacts: All environmental topics identified in Appendix G of the State CEQA Guidelines require analysis within an EIR. The Draft EIR will examine the following: Aesthetics, Agricultural and Forest Resources, Air Quality, Biological Resources, Cultural Resources, Geology/Soils, Greenhouse Gases/Climate Change, Hazards and Hazardous Materials, Hydrology/Water Quality, Land Use/Planning, Mineral Resources, Noise, Population/Housing, Public Services, Recreation, Transportation/Circulation, Utilities, Cumulative Impacts, and Growth Inducing Impacts.

Initial Study: An Initial Study has not been prepared for this project. As noted above, each environmental topic identified in Appendix G of the State CEQA Guidelines requires analysis in an EIR.

Date: _____

Signature: _____

Name/Title: _____

Phone/Email: _____

Appendix A

PROJECT LOCATION AND SETTING

REGIONAL LOCATION

The Project site is located in the City of Manteca, San Joaquin County. More specifically, the Project site is located to the north and west of the Stadium Shopping Center, to the west of Milo Candini Drive, to the east of McKinley Avenue, to the south of the City of Manteca Wastewater Quality Control Facility (WQCF), and to the north of State Route 120. (Figure 2-1 and 2-2).

The project site is located on the Lathrop, California, USGS 7.5-minute quadrangle, Township 2 South, Range 6 East. The UTM coordinates for the center point of the project site are 652688.47536 W, 4183417.94368 N (zone 10N, NAD 83, meters). The Lat/Long coordinates are 37.7853 N, -121.2660 W (WGS 84, decimal degrees). (Figure 2-3)

The Project site is within the City's Sphere of Influence and General Project site and has been identified by the City of Manteca to receive services from the City in the 2008 Municipal Services Review.

EXISTING LAND USES

The Project site currently has a General Plan Land Use designation "Public/Quasi-Public" (PQP), and a zoning designation of PQP. The land is owned entirely by the City of Manteca.

Big League Dreams ballpark is located on the eastern side of, and within, the Project site. The 28-acre site is fully developed with six replica ballparks, an indoor soccer facility, two restaurants and other supporting facilities all of which are open to the public and operated by private sector parties pursuant to ground leases. (Figure 2-4).

Topographic features include level agricultural fields, an irrigation canal, and wetland areas. Elevation ranges from approximately 20 feet to 25 feet above mean sea level (MSL). The agricultural fields are currently used for land application of recycled water from the Water Quality Control Facility (WQCF).

The Project site includes all, or a portion of, the following Assessor's Parcel Numbers (APN): 241-31-53, 241-31-44, 241-31-18, 241-31-32 and portions of APN 241-31-16, 241-30-48, 241-31-48, 241-30-62 and 241-30-61. (Figure 2-5).

SURROUNDING LAND USES

North: The boundary on the north of the Project site is primarily occupied by the WQCF. The property to the north is zoned PQP (Public/Quasi-Public).

East: The parcels to the east of the Big League Dreams portion of the Project site, across Milo Candini Drive, are zoned M1 Light Industrial and PQP.

PROJECT DESCRIPTION

South: The Project site is bordered on the south by SR 120. There is some additional vacant land lying to the south of the westernmost portion of the site. The Project site that lies to the south of Big League Dreams is occupied by the Stadium Shopping Center, and is zoned CG (General Commercial).

West: To the west, the Project site is bounded by McKinley Avenue and the Union Pacific Railway right-of-way. The parcels located to the west of those right-of-ways are outside of the City of Manteca boundary.

The Project site has relatively flat terrain. The UPRR rail lines are located along the western boundary. High voltage power lines, within Pacific Gas & Electric (PG&E) power line easements, traverse portions of the Project site running northeast/southwest.

ACCESS AND CIRCULATION

Regional Access

The City is strategically located close to and within view of SR 120, which provides primary access to Yosemite from the San Francisco Bay area. The City also lies between two major north-south freeways, I-5 and State Route 99.

Regional access to the Project site is primarily anticipated to be via SR 120 at the Airport Way interchange that lies to the south and east of the property. In the future, an additional SR 120 interchange is planned to be constructed to the south and west of the property at McKinley Avenue. This proposed new interchange (Tier 1 improvement) would provide additional access to the property, particular for those traveling from the Bay Area and points to the west.

Local Access

Locally, vehicular access will be achieved by public streets and roadways as follows: from Airport Way and then Daniels Street, which runs along the north side of the Stadium Shopping Center. Daniels Street will be extended from its current end point, in a westerly direction across to McKinley Avenue as part of the proposed project.

Passenger Rail

In addition to vehicular access, regional rail service for commuters to San Jose and Silicon Valley is provided on the by Altamont Commuter Express (ACE), on the Union Pacific Railway Line, with a stop at the Lathrop/Manteca station, which lies to the northwest of the property. The ACE Rail system also has a bus connection to the Dublin/Pleasanton BART station at the Pleasanton stop.

PROJECT GOALS AND OBJECTIVES

The Family Entertainment Zone (FEZ) Master Plan (hereinafter “FEZ”, “Master Plan”, or “Proposed Project”) has been prepared to provide a comprehensive planning document to guide and direct development of the 210.7 acre FEZ Project site. The Master Plan establishes the land uses, development concepts, guidelines and standards based on the goals and policies articulated in the

City's General Plan. The land uses, development standards and design establish the development vision and will facilitate implementation of consistent quality and character for the Project site. The Master Plan is intended to be more specific in guiding and directing development of the Project site.

The Master Plan will serve as the implementation tool for the City of Manteca with the following Goals:

- Enhance the City of Manteca's Zoning Ordinance for the FEZ Project site
- Provide an opportunity for a multi-use development project
- Provide destination recreation, retail, hotel and accessory facilities with the opportunity to supplement existing City facilities and attract tax generation for the City of Manteca
- Establish a framework for development with streamlined implementation
- Provide for a viable phased extension of City infrastructure and services to the FEZ

The Master Plan outlines the following list of Objectives.

- To expand and improve public and community access to the City's existing and thriving investments in regional sports facilities to provide additional community-based facilities to extend the City's position as the primary destination for family-based community recreation, active recreation sports and passive recreation and amenities in Central California.
- To enhance and build upon the regional tourism and visitor-serving attractions providing supporting destination facilities such as hotels, indoor water park and convention/meeting/ exhibition facilities that will facilitate and support the frequency and duration of utilization of the recreation and sports facilities through the FEZ.
- To enhance Manteca's reputation as "The Family City".
- To position Manteca to serve what is projected to be a trend toward a younger population in the region by providing an excellent youth sports and entertainment destination with critical mass to ensure its success.
- To provide facilities that support what has been identified as a growing trend toward family vacations being centered on regional youth, adult, and master's tournaments, as well as league sporting events, that require multiple day stays and can be tied to a variety of visitor interests including special events, education seminars, private events such as conferences, weddings, other social and cultural expositions, all of which are available to the public and the visitors/users of the FEZ.

PROJECT DESCRIPTION

- Specifically, to capitalize on the success of the Big League Dreams' sports facilities (currently booked weekends, two years in advance), by creating additional critical mass in regional sports and active facilities.
- To provide additional food and beverage facility choices to serve visitors to Manteca and users of the various facilities developed within the boundaries of the FEZ.
- To add to the proven regional draw enjoyed by Woodward Soccer Fields, which further helps to define Manteca as a regional tournament sports destination.
- To accentuate the site's strategic location along SR 120, which serves as the primary vehicular corridor from the Bay Area to Yosemite National Park and the Central Sierra Nevada Mountain areas.
- To raise the City's visibility in the region, particularly for all residents and citizens driving through the region.
- To create a Yosemite/Central Sierra Nevada Visitors Information Center for travelers to utilize on their trip to the national park and nearby national forests.
- To create a business center facility that is available to all groups and can utilize and augment utilization of the various active and passive recreation and sports facilities as well as all ancillary concessions and operations such as support retail and dining facilities.
- To expand upon the thriving regional draw of Bass Pro Shops, which is located on the south side Highway 120 to the southeast.
- To provide a walkable, safe, and friendly leisure and recreation environment for the citizens of Manteca and the region.
- To provide quality indoor and outdoor community gathering spaces for socializing, dining, and entertainment.
- To expand and install a series of public improvements in support of the FEZ, including but not limited to, the east-west vehicular connection between McKinley Avenue and Airport Way, public parking facilities throughout the FEZ, and to facilitate improvements to the storm water drainage system shared by the City and the South San Joaquin Irrigation District (SSJID).
- To facilitate the City's economic development and jobs-creation goals and objectives.

PROJECT DESCRIPTION

BACKGROUND

Since 2010, the City of Manteca has been in the process of developing a plan for a comprehensive multipurpose public use zone called the Manteca Family Entertainment Zone (FEZ). The plan is

intended to encompass multiple projects and parcels that provide an extensive recreation complex featuring new and existing recreation, park, water, sports and other leisure amenities. The Project site is intended to be open and accessible to the general public, and to serve the state, region, and the Manteca community as a multipurpose recreation center and public park facility. The FEZ will feature a wide range of active and passive open space and developed uses that will support short term and longer term activities and community events for users ranging from local citizens, day and weekend regional visitors, as well as destination tourists.

The Master Plan for the FEZ was developed in cooperation with the two private sector developers who are proposing to design and build the facility. The Master Plan will provide the appropriate zoning designation for the FEZ as well as provide development standards to implement future development within the Project site.

Projects and uses in the FEZ may be constructed and operated through a series of third party agreements, concessions and/or licensing agreements which may include ground leases of up to 55 years, with some uses needing longer lease terms up to 99 years. Projects and uses may be constructed and operated through a series of private-public partnerships whereby private sector operators and vendors of various public facilities are selected to develop and operate components of the FEZ. These components may include: public active and passive recreation and park facilities and sports amenities, and various commercial operations that are ancillary to the foregoing public facilities.

The FEZ will include public active and passive recreation and sporting facilities to be operated by public agencies and/or private sector vendors or operators, including the addition of the ball fields associated with and adjacent to Big League Dreams (BLD) Park, as well as the addition of multi-purpose playfields, primarily for soccer.

Certain project components will be public visitor serving in support of the extended use of the various public recreation and sporting amenities (such as hotels, restaurants, retail, and conference centers). Proposed and future development projects will include recreation tourism facilities such as overnight lodging, conference/convention/ exhibition facilities and specialized recreation attractions such as an indoor water park available to overnight guests. The primary objective of such uses is to expand the access to current and future public sports and recreation facilities, and expand access for out-of-area public participation in tournaments and training camps. These features will enable and increase the number and duration of extended stay periods for visitors and help facilitate public access for broader uses such as special events and on-site educational activities. Certain components and phases of the FEZ may include commercial retail and restaurant uses that serve park facility patrons and tournament participants and spectators as well as local clientele.

MASTER PLAN OVERVIEW

The Master Plan will create an overlay zone to the existing zoning of Public/Quasi-Public (PQP). The Master Plan includes a comprehensive land plan with design standards and guidelines to guide the development of the 210.7 acres. The Master Plan provides for a multi-use development that

PROJECT DESCRIPTION

offers a significant opportunity for the City of Manteca to attract recreation, entertainment, retail, restaurant, and commercial uses.

The Project site incorporates the existing approximate twenty-eight (28) acre Big League Dreams (BLD) facility and provides an additional twenty-five (25) acres to expand BLD and provide soccer fields. There is approximately sixty-two (62) acres identified for a potential mix of indoor and outdoor entertainment/recreational uses including a location for an outdoor stadium. The Project site provides approximately thirty-three (33) acres of commercial shopping that will generate approximately three hundred sixty thousand (360,000) square feet of retail and dining type uses. There is approximately twenty-nine (29) acres provided for a hotel/lodge, convention center and indoor water park.

The Master Plan is comprised of four basic design components: Retail and Restaurant, Recreation and Sports, Hotel, and Entertainment. Each is described below.

Retail and Restaurant

The Destination Retail and Restaurant area provides an opportunity to attract job generation and economic development to the west side of Manteca. It is strategically located along the State Route 120 corridor to ensure project visibility for future end-users, and to provide access to the State Route 120 corridor. The relationship to the existing and proposed recreational facilities and the hotel provides for customer base.

Recreation and Sports

The proposed recreational and sports uses serve to augment the existing and established success of Big League Dreams. This will serve as the integral part of the overall Project site providing passive and active open space, recreation areas, sports fields, stadiums, as well as gathering spaces for the community. Located throughout the Project site, the recreation areas will remain easily accessible to all users of the FEZ through a well-integrated and well-planned internal street network that encourages both bicycle and pedestrian use.

Hotel

The proposed hotel site will serve to provide lodging for users coming into town for the destination experience. It is to be a full service hotel with additional recreational and dining opportunities. A convention center shall be provided with the hotel and the hotel shall also provide recreation facilities that are complimentary to the FEZ, such as a water park.

Entertainment

The proposed entertainment areas serve to provide enjoyment for the whole family. Through thoughtful design this central piece of the FEZ will serve to bring people together to enjoy communal leisure time. It will be comprised of a variety of recreation and leisure activities which may include: miniature golf, golf cart racers, arcade games, and Laser-tag, among other things.

PLAN ADOPTION AND REGULATION

The Master Plan is intended to be adopted by the City Council and to serve as a tool for the City of Manteca to implement. The Master Plan is to be used by designers, developers, builders, and planners, to guide development of the Project site. The land use, development standards, and design guidelines are provided to ensure that all proposed developments remain consistent with the vision established by the Master Plan as the Project is built over time. The Master Plan development concepts, design guidelines, and standards are in accordance with the City's General Plan, Municipal Ordinances, and City Standard Plans and Specifications. The Master Plan shall be used to review, process, and approve development proposals for the Project site including but not limited to site specific development applications and site improvement plans.

Formation of one or more Community Facilities Districts (CFD) is also anticipated for the FEZ. The objective in forming CFDs is to provide financing for public improvements associated with the project, which may supplement funds available from former redevelopment bond proceeds.

LAND USE AND ARCHITECTURE

Land Use Concept

The Master Plan provides a comprehensive land use planning tool that provides the framework for development of the approximately 210.7 acre Project site. The intent of the Master Plan is to ensure a quality built environment that integrates a mix of land uses under a single uniform set of design and development standards. The FEZ Master Plan intends to build upon the success of the Big League Dreams facility by providing additional sports and field recreation, hotel and tourism, entertainment, retail, commercial and restaurant uses along the highly visible State Route 120 corridor. Although the FEZ may develop in multiple phases as individual land use/planning areas, the Master Plan will help the separate phases come together and operate as a cohesive and integrated entertainment/recreational facility.

The Master Project site is divided into 16 Planning Areas ("PAs") with four land use categories to group similar land uses: Retail/Commercial/Restaurant, Entertainment, Hotel and Conference Center and Sports and Field Recreation.

The Planning Areas serve as the basis for all of the land use and development standards contained in the Master Plan. Table 2.0.1 located in the Master Plan provides a detailed account of the Permitted, Conditionally Permitted and Not Permitted Use for each Planning Area.

Additionally, to help the FEZ develop with a cohesive design and appearance, the Master Plan provides development standards and guidelines for the various Planning Areas within the FEZ. The development standards are specific to PA-1 through PA-15, collectively, with separate development standards for PA-16. The development standards and guidelines are intended to work in conjunction with the City of Manteca's Zoning Ordinance. In some cases the Master Plan standards may conflict with or may be more or less restrictive than the City's Zoning Ordinance. In these circumstances, the Master Plan design standards and guidelines shall be used. Any

regulations not contained or illustrated in the Master Plan are deferred to the regulations contained in the City's Zoning Ordinance.

Conceptual Plan and Summary

A conceptual site plan is shown in Figure 2-6 Conceptual Site Plan. Figure 2-7 provides the planning area calculations. It is envisioned that the FEZ Planning Areas will develop within four broader land use categories. The following is a brief overview of the potential land uses within the land use categories and Planning Areas.

Retail / Commercial / Restaurants

- Open-air Retail, Dining and Entertainment Village (PA-3, PA-4, and PA-5)
 - Man-made lake / retention basin. The lake is envisioned as an amenity for personal paddle craft and/or kayaks, but not a swimming facility.
 - Lakeside boardwalk promenade with semi-pervious pavers
 - Retail shops
 - Restaurants, cafes, bistro's, coffee shops, micro-brewery
 - Small outdoor amphitheater
 - Outdoor entertainment / performance plaza
 - Destination playground
 - Family party pavilions
 - Beach volleyball courts

Entertainment

- Family Entertainment Center (PA-6, PA-7, PA-9, PA-10)

The following types of facilities may be offered:

 - Miniature golf, family arcade games, Laser-tag, Ball Crawl, etc.
 - Rock-climbing wall, ropes course, Flow-rider, zip-line, hard surface skate park
- Outdoor Sports/ Speed Zone (PA-12)
 - Stunt BMX race course
 - Electric motorized mini-car race course

Hotel, Conference Center and Waterpark

- Hotel: (PA-16)
 - This parcel is envisioned to be occupied by a hotel with a water park oriented toward tourism and leisure, primarily for families, but also to serve business conferences. Figure 2-8 illustrates the detailed site plan for this planning area.

Sports and Field Recreation

- Outdoor Regional Sports Zone (PA-1, PA-1a, PA-1b, PA-2, PA-2a, PA-11)
 - Existing Big League Dreams complex,
 - Additional baseball fields (2)*
 - Multi-purpose/soccer fields (12 to 13) in varying sizes*

* Note: Play fields are expected to be available for use as public open space prior to 4:30PM on weekdays.

- Indoor All-season Sports Center (PA-8)
 - Basketball, volleyball, cheerleading, gymnastics
- Championship Playfield (PA-11)
 - International-sized multi-purpose play field with fixed stadium seating.

Support Uses

- Parking Zones: (PA-12, PA-13, PA-14 and PA-15)
 - FEZ shared and joint parking areas

Architectural Design Standards & Guidelines (PA-1 through PA-15)

The FEZ Design Guidelines for PA-1 through PA-15 provides architectural design parameters that are intended to deliver a cohesive appearance by establishing an overall design theme for FEZ. The purpose of these design guidelines is to promote aesthetic quality, and to document the selected architectural styles with enough information to permit builders and their design team to accurately present the preferred architectural style. The overall architectural theme for the FEZ is Early California. There are two complimentary architectural styles that will depict the Early California character: Monterey and Spanish Colonial. Each style is presented in the Master Plan in the form of photographic images that capture the spirit and essence of each style along with a brief written synopsis narrating key style components. In addition to the required design elements, all designs shall be consistent with current codes and the design review process in Manteca.

Community Vision and Architectural Design Style

The architectural style known as Early California is the foundation for the theme of the built environment in these Planning Areas. The style is deeply rooted in the romance of centuries-old Spanish architectural vernacular, and was developed as modern California history began to unfold. The two types of styles that are generally associated with Early California are Spanish Colonial and Monterey styles.

Architectural Design Standards

The Master Plan includes general architectural design standards that apply to these planning areas, as well as specific design standards that apply to the Spanish Colonial and Monterey styles that will be developed in these planning areas. These include standards cover the following:

- General Standards
 - Building Form, Massing, and Scale
 - Roof Standards
 - Wall Standards
 - Material Standards
 - Color Standards
- Spanish Colonial and Monterey Standards

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- Exterior Materials
- Roofs
- Windows
- Design Features
- Colors

Site Planning Elements (PA-1 through PA-15)

The Master Plan has a variety of site planning elements that are covered for these planning areas. These include the following:

- Entry Treatment
- Site Planning Parameters
- Building Orientation
- Pedestrian Orientation of Buildings
- Common Open Space
- Service Areas

Architectural Design Standards and Guidelines for PA-16

These Design Standards & Guidelines apply only to Planning Area PA-16 for the development of a hotel and Conference Center facility. Following is Table 2.5.1 in the Master Plan provides a breakdown of required and recommended Architectural treatment for PA-16.

Community Vision and Architectural Design Style for PA-16

The architectural style known as Natural Rustic is to be the foundational influence for the theme of the built environment for PA-16. The hotel structure(s) shall be a marriage of organic yet simple-lined superstructure and classic mountain retreat detailing at a human scale. Iconic log exterior details shall emulate the vernacular of a historic National Park lodge, while adjacent towers are to settle in as simple massing. The overall massing of the hotel is to be influenced by a more contemporary, simple, articulated facade, and the points of entry shall incorporate details influenced by structures such as the Grand Canyon Lodge.

Architectural Design Standards for PA-16

The Master Plan includes general architectural design standards that apply to this planning area, as well as specific design standards that apply to the Natural Rustic style that will be developed in the planning area. These include standards cover the following:

- General Standards
 - Building Form Massing and Scale
 - Building Material Standards
 - Roof Material Standards
 - Colors and Finishes - Standards
 - Accessory Elements and Screening - Standards
 - Trash Enclosures - Standards
 - Mechanical Equipment - Standards
 - Natural Gas Meters, Electrical meters, Site Utilities and Equipment

- Exterior Architectural Lighting Standards

Site Planning Guidelines for PA-16

The Master Plan has a variety of site planning guidelines that are covered for this planning area. These include the following:

- Entry Treatment
- Building Orientation
- Pedestrian Orientation and Circulation

Other Design Standards and Guidelines

The Master Plan includes a variety of other important standards and guidelines to facilitate the desired design. These include: 1) Sustainable Development Guidelines and Environmental Considerations, and 2) Sign Regulations.

CIRCULATION AND PARKING

Circulation Plan

The circulation network for FEZ consists of: two partial existing major collector roads, the provision of minor collector streets, bike lanes and pedestrian paths, and future public transportation routes. The primary goal of the FEZ circulation plan is to provide safe and efficient movement of vehicles, cyclists and pedestrians within the Project site while also facilitating safe and efficient connections to the existing street and highway network.

Access to the Project site will be provided by Daniels Street which provides a direct link from the Project site to the existing South Airport Way interchange at State Route 120. South Airport Way also provides access to the heart of downtown Manteca. Milo Candini Drive will be extended in the future (under a separate project) to the north where it will intersect Yosemite Avenue that provides access to Manteca. Additionally, the Project is designed and planned so that as development of the McKinley Avenue/State Route 120 interchange to the west of the Project site occurs, there will be a connection from the Project site to State Route 120 in both the east and west directions.

Improvements within the Project site include the establishment of a new internal circulation network as well as the extension and enhancement of existing streets. The proposed vehicular circulation system will provide convenient and safe access to all locations within the Project site. The planned street network provides access to all planned uses from Daniels Street and its extension to McKinley Avenue, and Milo Candini Drive via two collector streets which link to a Loop Road central to the Project site.

All streets within the Project site are designed with sidewalks on both sides of the street, with the exception of the Buffer Street along the northern property boundary. A well-integrated street and sidewalk system and street landscaping along the streets coupled with both Class I bike paths and Class II bikeways along the roadways promotes pedestrian and bicycle use throughout the Project site.

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Daniels Street, a partially existing right-of-way, is classified as a major collector road in the City of Manteca's General Plan Circulation Element and the portion of Daniels Street that is aligned through the Project site will be implemented as part of this Plan. New rights-of-way within the Project site are:

- Major Collectors:
 - 'A' Street - Daniels Street,
 - 'B' Street - Milo Candini Drive
- Minor Collectors:
 - Street 'B1' - Wawona Street
 - Street 'C1' - Connector Road/bikeway
 - 'C' Street - Loop Road,
 - 'D' Street - Buffer Road

The Circulation Plan includes Circulation Standards, rights-of-way standards, roundabout standards, internal circulation standards, parking standards, public transit, and non-vehicular circulation, each of which is discussed in detail in the Master Plan.

INFRASTRUCTURE

The infrastructure for the planning areas was planned in accordance with the City of Manteca Standards, and in consultation with Manteca Public Works staff. All proposed improvements are consistent with the City's adopted Master Plans, specifically: City of Manteca 2005 Water Master Plan (Kennedy/Jenks), City of Manteca 2012 Wastewater Collection System Master Plan (NV5), and the City of Manteca 2013 Storm Drain Master Plan.

Generally, all proposed master utility infrastructure components will be constructed within proposed street rights-of-way. However, two major utility corridors (easements) are proposed within the Project site; one at the west and northwest boundary of the Project site and one that borders the west edge of the Big League Dreams complex. These corridors are anticipated to be approximately 50 feet wide to accommodate various utilities. There will also be three storm drainage storage facilities (basins and/or park/basins and a lake).

Water Master Plan

The City of Manteca currently provides domestic water to its customers via a network of wells and transmission lines which draw groundwater and distribute throughout the City. The City also provides treated surface water via the South County Surface Water Supply Project (SCSWSP), a joint project with the South San Joaquin Irrigation District, the City of Lathrop, the City of Tracy, and the City of Escalon.

Existing Facilities: Existing distribution improvements in the vicinity of the FEZ include a 12" main in Daniels Street, extending from Airport Way to the west end of Daniels Street, and a 12" main in Milo Candini Drive extending from Daniels Street to the north limits of Big League Dreams. North of the project, there is an existing 12-inch line in Yosemite Avenue.

Proposed Facilities: The FEZ will receive water service by extending the existing distribution system through the proposed development. Specifically, a 12-inch distribution main will be installed within the proposed alignment of Milo Candini from its current northern terminal to Yosemite Avenue, providing a looped connection between Daniels Street and Yosemite Avenue. This system will be further extended through the development with 12-inch lines in the loop road and Wawona Street, as well as Daniels Street to McKinley Avenue. This will provide a reliable distribution network to serve the proposed uses within the project. Smaller water lines (not shown in the master plan) will be installed as needed to extend water from the 12-inch distribution mains to the proposed developments. No additional water supply (well) or storage (tank) will be required for the development of the project.

Recycled Water: The City has plans to develop a recycled water system that will provide landscape irrigation water to public parks, landscaping, etc., with recycled water from the City's Water Quality Control Facility (WQCF). The FEZ will be a natural recipient of this recycled water due to its close proximity to the WQCF and its large areas of open space/park. Proposed recycled water improvements within the Project site will include the installation of 12-inch distribution mains extending from the WQCF south along the west side of the WQCF to Wawona Street and then east to the proposed utility corridor west of Big League Dreams and then south to connect to the existing recycled water line in Daniels Street. These recycled water lines will be charged from the domestic system initially, but will ultimately be disconnected from the City's domestic system and isolated as a recycled water (purple pipe) system. Figure 2-9 depicts both the existing and proposed master water distribution system components described above.

Sewer Master Plan

Existing Facilities: The City of Manteca currently provides sanitary sewer service to its customers via a network of gravity and force main sewer lines. Several pump stations and lift stations located throughout the City augment this sewer line network. This conveyance system terminates at the City of Manteca Water Quality Control Facility (WQCF), located directly north of the Project site.

Properties south of SR 120 are served by the South Manteca Trunk line, which consists of a combination of gravity lines and force mains, and terminating into the Tara Park pump station, which conveys the sewer flows to the WQCF via an 18-inch force main that crosses under SR 120 and runs through the Project site just west of Big League Dreams. Both Big League Dreams and the commercial development southeast of the Project site connect into this force main with individual pump stations. An existing 12-inch sewer force main located on the west end of the Project site conveys industrial sewer flows to the WQCF. There is an existing 36-inch gravity effluent line that traverses the northwest portion of the Project site delivering irrigation water to City-owned agricultural fields in the project vicinity and privately-owned agricultural fields south of SR 120.

Proposed Facilities: The City of Manteca Wastewater Collection System Master Plan calls for a 48-inch to 54-inch diameter sewer trunk line through the Project site to replace the existing force main serving the southern portion of Manteca. This trunk line will extend from the existing 60-inch gravity line that has been stubbed just south of SR 120 to an existing 60-inch stub within the WQCF. This trunk line will be constructed with the development of land on the Project site inside

the east utility corridor. Sanitary sewer generated by the FEZ will be conveyed to this trunk line via 8-inch gravity sewer lines located within proposed street rights-of-way.

The City has plans for an additional 36-inch gravity effluent line and one more 12-inch force main to be located along the western edge of the Project site. The existing 36-inch gravity effluent line will be relocated into the west utility corridor, and the new effluent lines will be installed alongside it. The existing 12-inch industrial waste force main will also be relocated into this utility corridor. Figure 2-10 depicts both the existing and proposed master sewer collection system components described above.

Storm Drain Master Plan

The City of Manteca currently provides storm drainage via a system of gravity storm drain lines which terminate at detention or retention facilities. Existing detention facilities discharge into a network of open channel and underground pipes owned and maintained by the South San Joaquin Irrigation District (SSJID). SSJID facilities eventually drain into the French Camp Outlet Canal (FCOC).

The Project site is bisected by the FCOC and two SSJID drain lines that feed into it (Drain 7 and Drain 8). Drain 7 travels underground within a box culvert in Daniels Street and daylights into an open ditch at the west terminal of Daniels Street. Drain 8 conveys agricultural drainage and stormwater runoff from properties south of SR 120. Drain 8 travels under the highway in a box culvert and drains out into an open ditch that travels north to its confluence with Drain 7 to form the FCOC. The FCOC travels northwest across the Project site and then follows the alignment of the Union Pacific Railroad to the north. Storm drain runoff from all existing development within or near the FEZ (including Big League Dreams and the commercial development to the southeast) pump their runoff into this drain system. Big League Dreams maintains a storm drain basin on the west side of the Project site that will eventually be replaced with additional ball fields and other facilities as part of the Master Plan. When this development occurs, the storage volume lost by the development of this basin will be replaced with the development of the Lake.

Development of the FEZ will require the relocation of the FCOC and Drains 7 and 8. It is proposed that each of these facilities be converted from an open channel to an underground pipe system, and that these facilities will be routed north through the east utility corridor (just west of Big League Dreams) west under Wawona Street, then north to the current FCOC canal next to the railroad. The FCOC carries a peak flow of approximately 150 cubic feet per second (cfs). To accommodate this flow, the channel will be replaced with dual 60-inch pipes. Installation of this conveyance system is expected to occur with the first phase of infrastructure, along with the construction of the Daniel Street extension to McKinley Avenue.

The Project site is divided into three major watersheds (each consisting of two sub-sheds). Runoff from each watershed will be collected by a network of pipe systems and conveyed to a storage facility serving the watershed. The peak volume from the design storm will be retained in the storage facility and then emptied (pumped) into the FCOC off-peak (when capacity in the FCOC is available). The three watersheds are described below:

- **Watershed A (80 acres):** This watershed consists of the north (A2) and northwest (A1) portions of the Project site. Runoff from this watershed will be conveyed to a basin located along the north edge of the Project site, just west Street C1. In order to reduce the size of this basin, the future parking lots under the power line easements will be designed to accommodate an average of three inches of storage above the pavement during the design storm.
- **Watershed B (87 acres):** This watershed consists of the retail commercial area located at the center of the Project site (B1) and Big League Dreams (B2). Runoff from this watershed will be stored in the proposed lake. The water elevation in the lake will be established to maintain approximately 24-inches freeboard that will serve as the storage area for peak runoff. Additionally, the Big League Dreams Parking lot will retain runoff during a peak storm to an average depth of 4 inches. Storage in the Lake will be pumped into the FCOC via a pump station and force main.
- **Watershed C (44 acres):** This watershed consists of PA-16 (C2) and the Southwest (C1) portion of the Project site. Runoff from this watershed will be conveyed to a triangular-shaped basin within the Southwest area. Additionally, the two large parking lots within PA-16 site will retain an average of six inches of storage above the pavement during the design storm.

The proposed storm drain system will include water quality features designed in conformance with the standards of the Regional Water Quality Control Board for the Central Valley Region, the City of Manteca, and SSJID. Storm water regulations for construction projects using Best Management Practices will be incorporated into the design. Discharge flow rates from each detention facility into the FCOC will be in conformance with the requirements of the City of Manteca and the SSJID. Figure 2-11 depicts both the proposed storm drainage components described above.

Telephone Service

Telephone service will be provided to the FEZ by Verizon Communications. Verizon currently owns and operates a telephone service network throughout the City of Manteca and will augment its existing facilities in the project vicinity and extend service into the Project site as necessary to serve the FEZ.

Electric Service

Electricity will be provided to the FEZ by Pacific Gas and Electric (PG&E). PG&E currently owns and operates an electric service network throughout the City of Manteca. It is anticipated that PG&E will augment its existing electric service facilities in the vicinity and extend service into the Project site in order to serve the FEZ.

Natural Gas

Natural gas will be provided to the FEZ by PG&E. PG&E currently owns and operates a natural gas service network throughout the City of Manteca. It is anticipated that PG&E will augment its

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existing natural gas facilities in the vicinity and extend service into the Project site in order to the serve the FEZ.

Cable Television

Cable television will be provided to the FEZ by Comcast. Comcast currently owns and operates a cable television network throughout the City of Manteca. It is anticipated that Comcast will augment its existing cable television facilities in the vicinity and extend service into the Project site in order to serve the FEZ.

Supporting Public Service Facilities - Public Safety/Police and Fire Services

The City of Manteca Police Department is the local law enforcement entity that would serve the FEZ. The Manteca Police Department currently operates on a four or five beat system.

Fire service is provided from any/all fire stations within the city, and is supplemented by mutual aid agreements with neighboring fire protection districts. Service to the Project site would be enhanced and increased at the discretion of the City of Manteca, based upon calls for service trends and special events.

LANDSCAPE AND OPEN SPACE

Landscape Vision

The Landscape Vision is inclusive of sport fields, parkways, bike lanes, lake, pedestrian-oriented open space, coordinated street tree network, entry features, signage, and buffer landscape spaces. The Master Plan includes Landscape Design Guidelines and Standards that cover the following topics:

- Entry Features
- Streetscape Landscape Features
- Pedestrian-Oriented Public Open Space
- Fencing
- Street Lighting
- Site Furniture
- Landscape and Irrigation System

ADMINISTRATION AND IMPLEMENTATION

Implementation of the Plan

The Family Entertainment Zone (FEZ) Master Plan is the mechanism to ensure that all future development within the Project site is consistent with the City of Manteca General Plan. The Master Plan will serve as a tool for the City of Manteca to implement the development of the Project site. Every effort has been made with the Master Plan to provide policies and regulations that are specific to the Project site.

If any situation arises in the implementation of the Master Plan that is not addressed by specific development regulations or guidelines or if an issue, condition, or situation arises that is not clearly addressed in the Master Plan, the Community Development Director (“Director”) shall provide an interpretation based on such City codes, goals, policies, plans and requirements as most closely related to the subject matter of the issue or situation to be interpreted.

In some cases the Master Plan standards may conflict with or be more restrictive than the City’s Zoning Ordinance. In these circumstances, the Master Plan standards and guidelines prevail. For any matters not specifically addressed by the Master Plan, the Manteca Municipal Code shall apply and shall be interpreted in a manner that is consistent with the goals and objectives of the Master Plan.

Subsequent to adoption of the Master Plan, individual project applications will be reviewed to determine consistency with the Master Plan, the FEZ Environmental Impact Report (EIR), and any other applicable City of Manteca regulatory documents. All future applications including but not limited to Site Plans, Tentative Subdivision Maps, and Use Permits within the Project site will be subject to the requirements of the Master Plan and EIR.

Development applications will be submitted to the City of Manteca Community Development Department and subject to the Fee Schedule adopted by City Council. The Community Development Department will conduct an initial review of the application for completeness and consistency with the adopted Master Plan, the FEZ EIR as well as other ordinances and standards. The Community Development Director may require additional studies and/or analyses that may include, but are not limited to: traffic and infrastructure studies.

The Community Development Director, acting upon any application that is determined to be complete shall (1) approve the application, (2) approve the application with conditions or modifications, (3) deny the application, or (4) refer the application to the Planning Commission. The Community Development Director or Planning Commission determination for approval shall be based on the finding that the project application is consistent with the Master Plan.

If the City determines that an Amendment to the Master Plan is warranted, an Amendment to the Master Plan may be requested. The request must provide adequate justification.

Master Plan Phasing

Development of the FEZ will depend on market conditions and demand for infrastructure. A conceptual phasing scenario was put together to illustrate potential phasing of the project; however, the conceptual phasing scenario is not intended to restrict development of later phases just because a phase has not built out. The real-world phasing will be based on market. The following is a description of a conceptual phasing scenario for the FEZ:

Phase 1:

It is preliminarily envisioned that Phase 1 development will include:

- A 500 room hotel including 30,000 square feet of conference/meeting/exhibition facility with 37,500 square feet of restaurant (food and beverage) space, community space,

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general retail, party rooms and related game rooms. Also will include a 75,000 square foot indoor multi-level waterpark.

- Partial construction of Buffer road and landscape along the northern edge of the overall property, north of Planning Areas 12 and 15.
- Main Vehicular Entrance: The FEZ will have its main vehicular entrance on Daniels Street, located at a point directly north of the northwest corner of the Stadium Shopping Center.
- The extension of Wawona Street in a westerly direction, along the north side of the existing BLD complex, connecting to the FEZ loop road in a southwesterly direction, providing a view into the lake at the center of PA-5.
- The service entrance to the northwest corner of the Stadium Shopping Center will be reconfigured to provide navigable truck turning movements into the rear of that parcel.
- PA-1: The development of the 11.8 acre PA-1 with new multi-purpose turf playfields. The plan has been conceptualized such that three International Soccer Fields and two U-12 size fields would be provided, along with one U-8 size field at the northeast corner of the parcel. Alternately, the International Soccer Fields could be divided into two U-12 youth soccer fields, yielding a total of eight U-12 playfields, with the one U-8 size field. In addition, minor facilities for rest rooms, maintenance, storage and administrative offices may be provided in the parcel. PA-1 would be provided vehicular access by the extension of Milo Candini Road.
- PA-15: Parking for the playfields would be offered through the build-out of a parking lot in PA-15, a 3.1-acre area, located in the PG&E right-of-way.
- PA-2, a 7.6-acre parcel lying to the west of PA-1, would provide additional multi-purpose playfields: Two U-12 and two U-13 sized youth soccer fields.
- PA-14: A portion of the PA-14 parking lot would be constructed at this time, to serve parking needs of players and guests.
- PA-1a and PA-1b: The construction of two new ball fields to the west of the existing Big League Dreams complex.
- The initial extension of Daniels Street, in a westerly direction. Daniels Street will extend from its current terminus at the southeast corner of the property, in a westerly direction, providing access to the proposed hotel and conference center site to the south, and to the Retail, Dining and Entertainment District of the FEZ to the north (PA-4 and PA-5).
- Storm water management systems south of Daniels Street (PA-6).
- The Daniels Street right-of-way will be extended in a westerly/northwesterly direction, ending at a "T" intersection with a new planned road that runs from the north and bends to the west, dying into McKinley Avenue, at the western edge of the Project site. It is anticipated that utilities will be taken underground within this right-of-way.
- A comprehensive Sign Program for PA-16. The comprehensive Sign Program for PA-16 shall address: Pylon Signs, Building Signs, Directories, Monuments, Misc. Signage, and LED Signs. An LED sign, which is specifically proposed in this phase for the hotel facility, includes a conditional use permit application in accordance with City requirements.

Phase 2:

- PA-3 includes the following:
 - The FEZ entry archway that spans across Daniels Street, under which vehicles will drive to access the FEZ.
 - Food and beverage enterprises that frame an east-west walkway. The walkway will be aligned on axis with the existing Big League Dreams complex, extending in a westerly direction, toward the center of the FEZ. This serves as a vital connection between the existing sports facilities and the FEZ. Buildings are expected to be one to two stories tall.
 - Additional restaurants at the northeast corner of Daniels Street and a new loop road that will wrap around the core of the FEZ.
 - Shared surface parking that may serve retail/restaurants in PA-3 and the two new BLD ball fields (PA-1a and PA-1b, included in Phase 1 description above).

Phase 3:

- PA-4, including the following:
 - “Main Street Retail” framing a pedestrian plaza and walkway that runs in a north-south direction, providing a visual and pedestrian connection to PA-16 that lies to the south, and to the lake and the center of PA-5 that lies at the north.
 - A small loop road that wraps around PA-4, and includes diagonal parking on both sides of the street. It further provides a drop-off lane that provides direct pedestrian access to the promenade around the lake and the retail village.
- PA-5, including the following:
 - Initial partial build out of the Dining, Retail and Entertainment Village. Leasable space is envisioned to include stores, small shops, cafes, restaurants, and bistros.
 - A man-made lake, surrounded by a hardscape promenade with railing.
 - The FEZ loop road will frame PA-5 like a “horseshoe” on its east, north, and west sides.

Future Phases:

- PA-6 occupies the southwestern most parcel, abutting residential lots to its west, and vacant land to its south. This parcel is intended to serve as expansion for the family entertainment offerings.
- PA-6A occupies the southwest corner of the street connection to McKinley Avenue. It is envisioned that a tourism and visitor center would be provided along with a potential relocation site for the Manteca Convention and Visitors Bureau, as well as a small bus terminal and temporary bus parking for tours connecting to Yosemite and the Sierras.
- PA-7 flanks Daniels Street, to its northeast. It also flanks the FEZ loop road, to its west.
- PA-8 incorporates an Indoor All-season Sports and Exhibition Center, and will be located to the north of the FEZ loop road, between PA-2 and 7. It is bordered by the PG&E power line right-of-way to its north.
- PA-9 is also bordered by the PG&E power line right-of-way to its north. It abuts McKinley Avenue to its west, and is slated for FEZ expansion.
- PA-10 is a continuation of FEZ expansion, and it’s situated to the north of PA-9, to the north of the PG&E power line right-of-way.

PROJECT DESCRIPTION

- PA-11 is situated on a northwest axis from the heart of the FEZ, the lake, and is situated in the far northwest corner of the Project site, to the north of the PG&E power line right-of-way.
- PA-12 is also located to the north of the PG&E power line right-of-way. It spans the majority of the northern boundary of the Project site, abutting a boundary road with a set-aside landscape buffer, and then the WQCF to the north. This area is envisioned to serve as an outdoor sports zone.
- PA-13, PA-14, and PA-15 comprise the PG&E right-of-way that stretches diagonally across the Project site in a west/southwest- east/northeast direction. These planning areas are reserved strictly for shared parking for the entire FEZ project. Setbacks will be established to protect the PG&E towers.

Build Out and Phasing:

Construction will have several phases, depending on market conditions and the availability of financing. It is currently anticipated that the timeframe for the construction is 8-12 years. Infrastructure extensions will be made, as needed, to service the constructed portions of the Project site.

Master Plan Compliance and Enforcement

The Community Development Director is responsible for enforcing the provisions of the Master Plan. The regulatory elements of the Master Plan are enforceable pursuant to the enforcement requirements of the Manteca Municipal Code.

The Family Entertainment Zone (FEZ) Design Review

To ensure quality and continuity of the Master Plan, the FEZ master developer will, through private agreement, review and approve all development applications prior to submittal to the City of Manteca submittal and review. A letter confirming the review and approval of the submittal by the FEZ Design Review shall accompany FEZ project applications to the City.

Landscape Maintenance

The public landscape components of the FEZ are critical elements of the community vision and feel. The maintenance of all common outdoor recreation space and public open space, as well as landscape easements will be funded through an Association established by the FEZ master developer and/or the City of Manteca. The establishment and preservation of a long term, viable maintenance plan is a key component for the FEZ; therefore, the City will maintain the right to assume landscape maintenance responsibilities in the case of neglect or default by, or at the request of, the FEZ Association. If the City assumes the maintenance responsibility, the property owners shall be responsible for all costs associated with said maintenance. Funding shall be provided by the property owners through the establishment of a Community Facilities District or other financing mechanism and shall include funds for administration along with replacement costs. The final method of maintenance financing mechanism shall be approved by City of Manteca.

Formation of one or more Community Facilities Districts (CFD) is also anticipated for the FEZ. The objective in forming CFDs is to provide financing for public improvements associated with the Project, which may supplement funds available from former redevelopment bond proceeds.

PROJECT ENTITLEMENTS

The project consists of the following components:

- 1) Approve the FEZ Master Plan.
- 2) Rezone of all parcels, APN's 241-31-53, 241-31-44, 241-31-18, 241-31-32 and portions of APN 241-31-16, 241-30-48, 241-31-48, 241-30-62 and 241-30-61 (Figure 2-5) from Public/Quasi Public (PQP) to Master Plan (MP).
- 3) Large Lot Tentative Parcel Map, to promote the various phases of development the 210.7 acre site will be subdivided into large lots available for individual development. The large lot map will include approximately 19 parcels, which will roughly resemble the layout of the Planning Areas.
- 4) Site Plan Review for Phase 1 of the project.
- 5) Conditional Use Permit for the LED sign associated with the Hotel facility.

USES OF THE EIR AND REQUIRED AGENCY APPROVALS

The City of Manteca will be the Lead Agency for the proposed project, pursuant to the State Guidelines for Implementation of the California Environmental Quality Act (CEQA), Section 15050.

This EIR will be used by the City of Manteca to take the following actions:

- Certification of the EIR
- Adoption of the Mitigation Monitoring and Reporting Program
- Approval of the Master Plan.
- Approval of a Rezone of all parcels from Public/Quasi Public (PQP) to Master Plan (MP).
- Approval of a Large Lot Tentative Parcel Map.
- Site Plan Review for Phase 1 of the project.
- Approval of the Conditional Use Permit for the LED sign associated with the Hotel facility.

The following agencies may be required to issue permits or approve certain aspects of the proposed project:

- California Department of Fish and Game - Streambed Alteration Agreement pursuant to Section 1602 of the California Fish and Game Code;

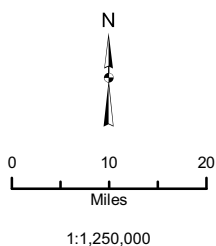
PROJECT DESCRIPTION

- California Department of Transportation (Caltrans) – Encroachment permits if any infrastructure boring is necessary under SR 120 or in association with the SSJID’s French Camp Outlet Canal undergrounding.
- Central Valley Regional Water Quality Control Board (CVRWQCB) - Storm Water Pollution Prevention Plan (SWPPP) approval prior to construction activities pursuant to the Clean Water Act,
- Central Valley Regional Water Quality Control Board (CVRWQCB) – Permitting of State jurisdictional areas, including isolated wetlands pursuant to the Porter-Cologne Water Quality Act;
- Central Valley Regional Water Quality Control Board (CVRWQCB) – Water quality certification pursuant to Section 401 of the Clean Water Act.
- San Joaquin Valley Air Pollution Control District (SJVAPCD) - Approval of construction-related air quality permits pursuant to SJVAPCD rules and regulations.
- SJCOG, Inc. (SJCOG) – Issuance of incidental take under the San Joaquin Multi-Species Habitat Conservation and Open Space Plan (SJMSCP).
- South San Joaquin Irrigation District (SSJID) – Approval to underground French Camp Outlet Canal.
- United States Army Corps. Of Engineers – Permitting of federal jurisdictional areas pursuant to Section 404 of the Clean Water Act;



MANTECA FAMILY ENTERTAINMENT ZONE

Figure 2-1: Regional Location

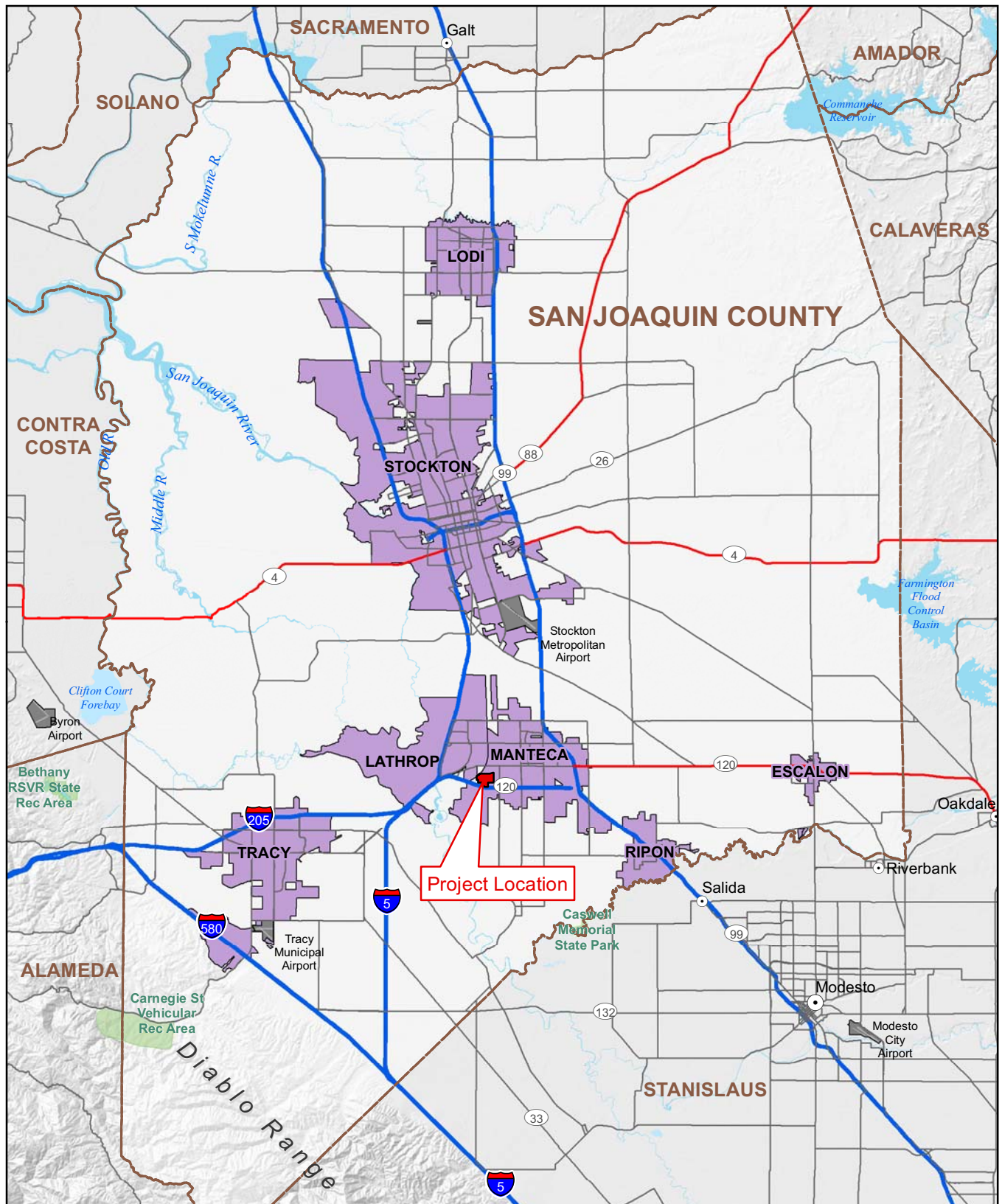


Data source: California Spatial Information Library Map date: June 11, 2014.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



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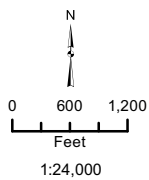
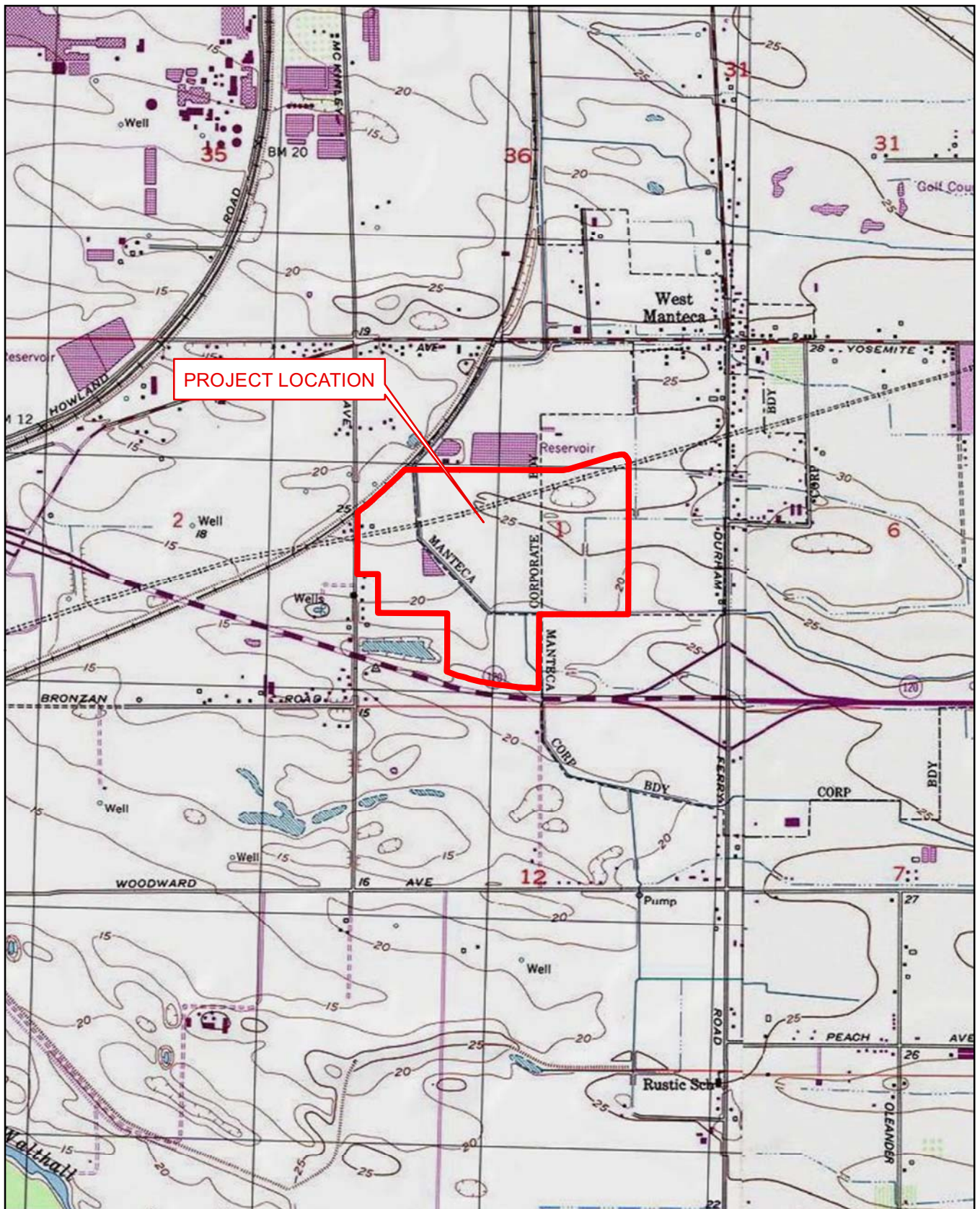
MANTECA FAMILY ENTERTAINMENT ZONE

Figure 2-2: Project Vicinity

Data sources: California Spatial Information Library, ESRI StreetMap North America, San Joaquin County GIS. Map date: November 5, 2014.

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A Land Use Planning, Design, and Environmental Firm

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MANTECA FAMILY ENTERTAINMENT ZONE

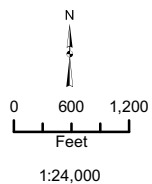
Figure 2-3: USGS Topographic Map

Data sources: ArcGIS Online USA Topo Maps. Map date: November 5, 2014.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



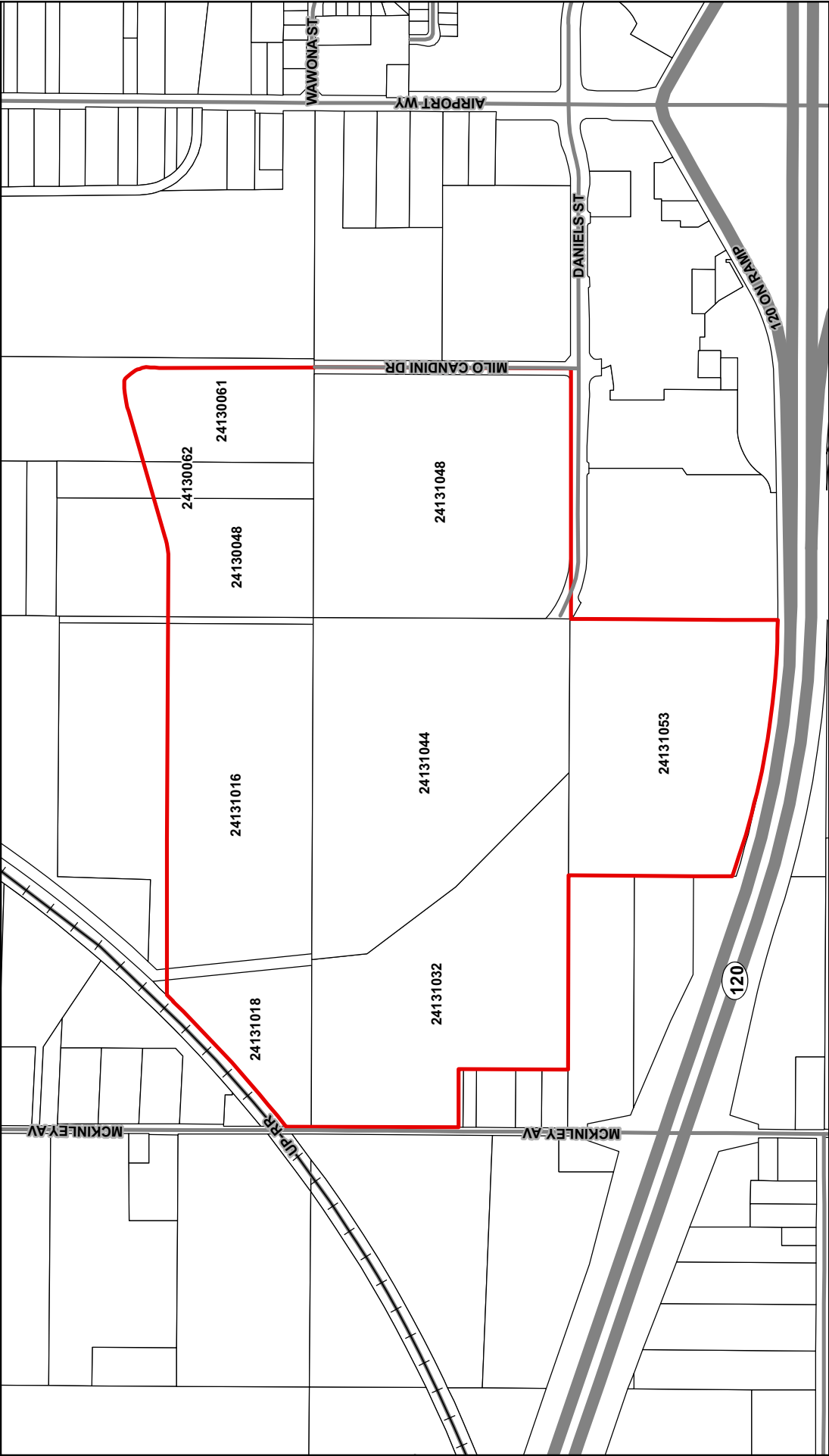
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MANTECA FAMILY ENTERTAINMENT ZONE

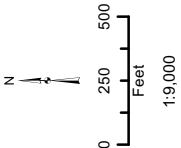
Figure 2-4: Aerial Photo

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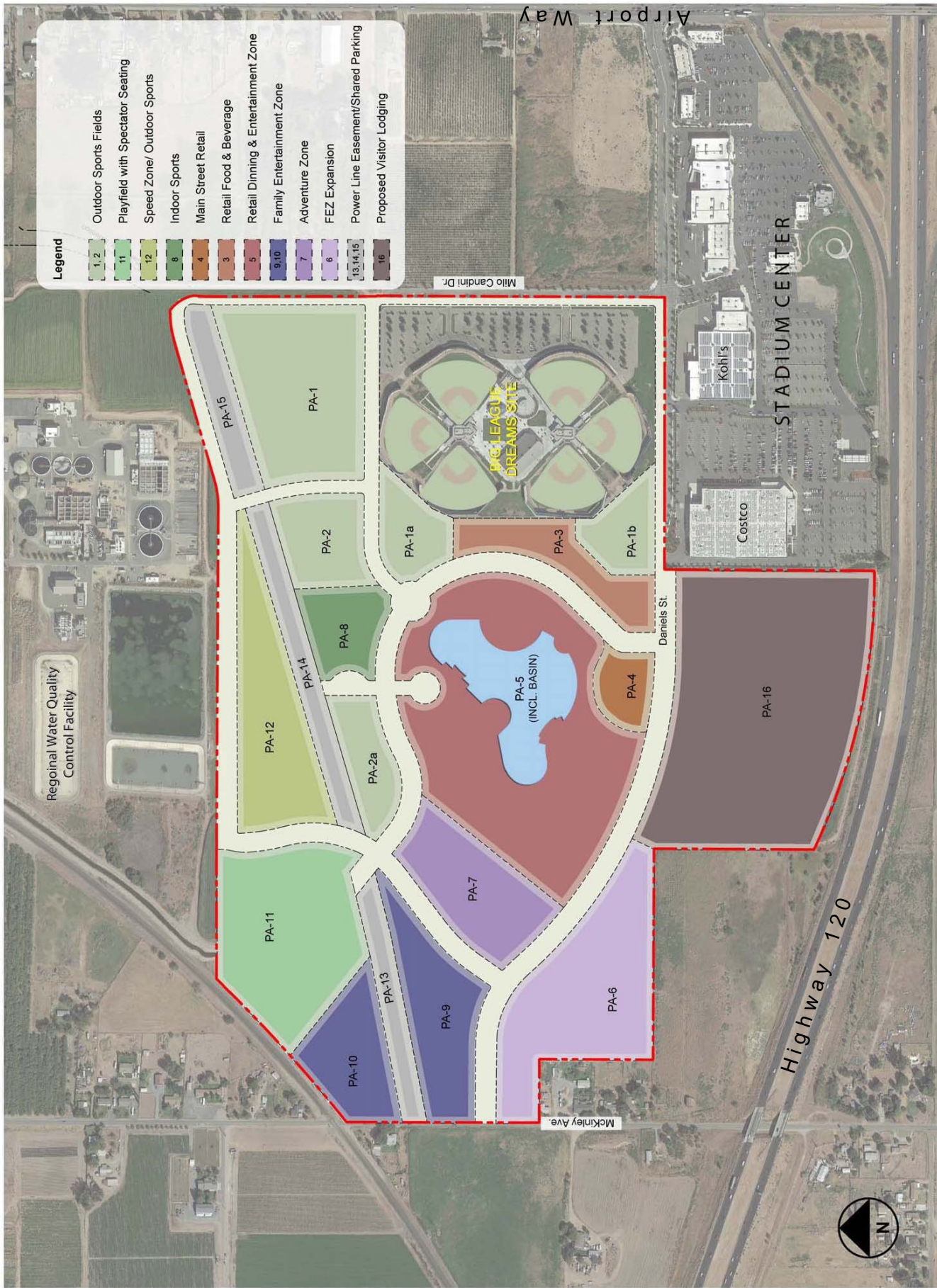
MANTECA FAMILY ENTERTAINMENT ZONE

Figure 2-5: Assessor's Parcel Map



De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

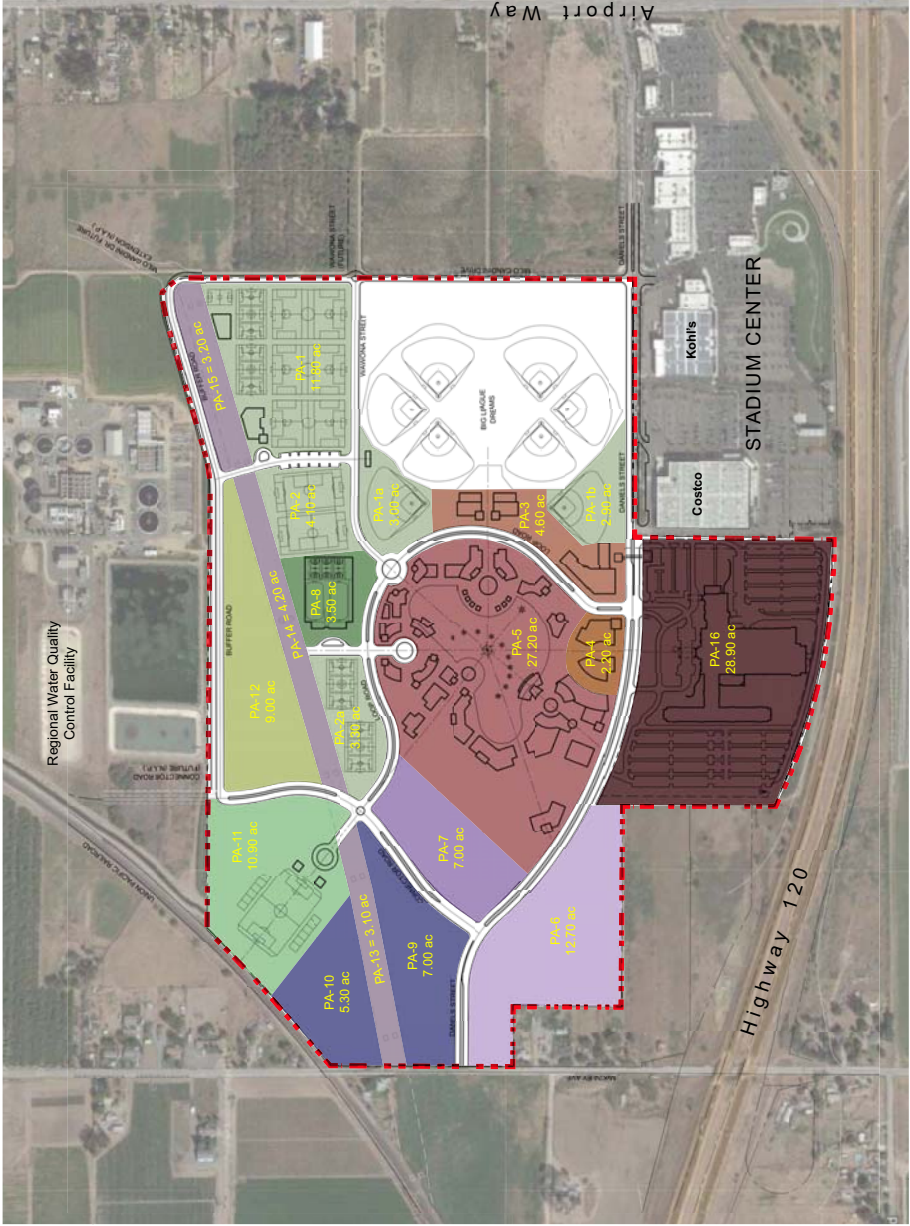
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MANTECA FAMILY ENTERTAINMENT ZONE

Figure 2-6: Conceptual Plan

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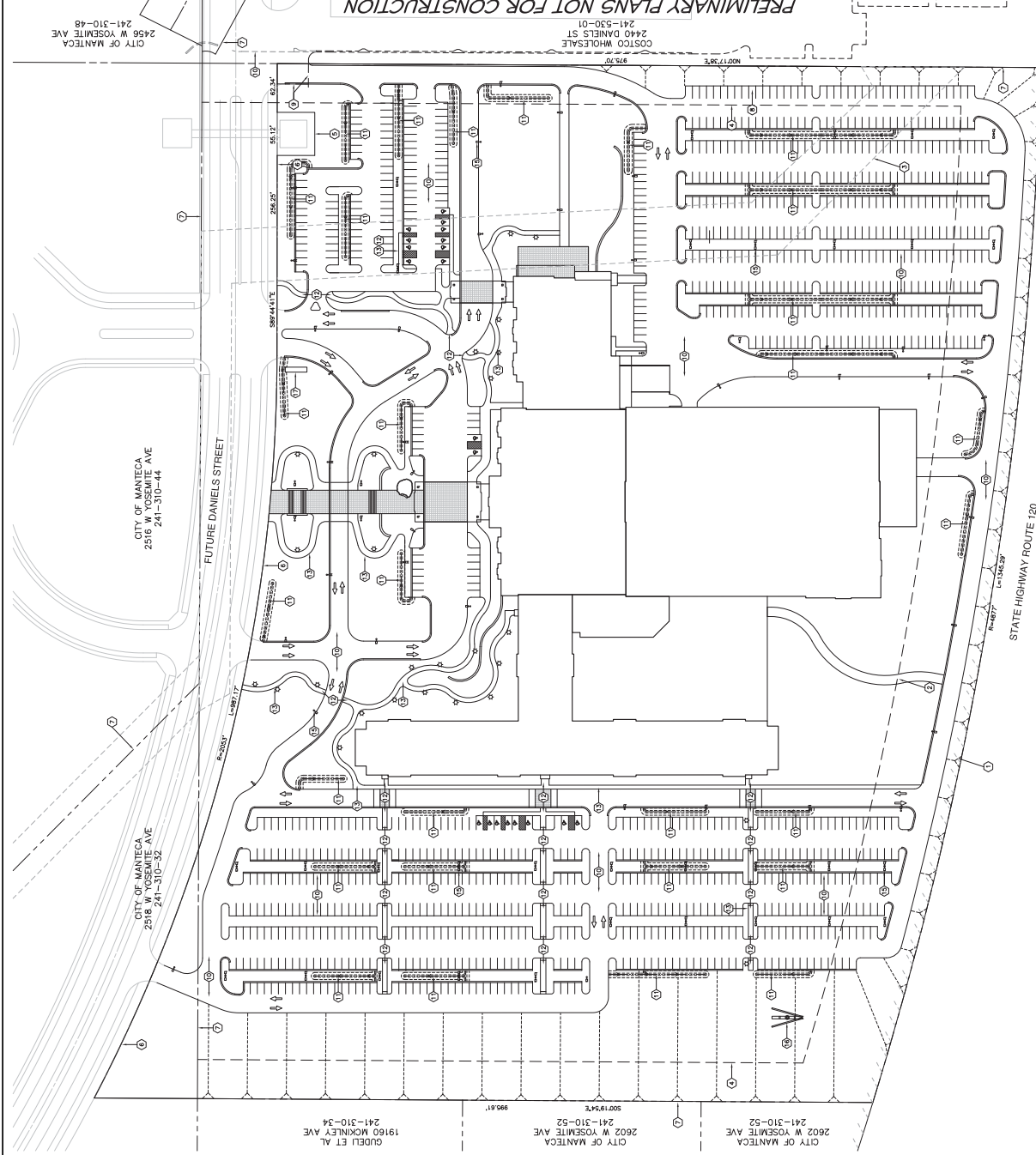
FEZ PLANNING AREA PROJECT BUILD-OUT & SUMMARY TABLE			
Planning Area	Projected Land use	Gross Land Area (acre)	Building SF
PA-1	Outdoor Sports Fields	11.80	13,068
PA-1a	New Baseball/Softball Field	3.00	1,742
PA-1b	New Baseball/Softball Field	2.90	0
PA-2	Outdoor Sports Fields	4.10	0
PA-2a	Outdoor Sports Fields	3.30	0
PA-3	Retail, Food & Beverage	4.60	59,711
PA-4	Main Street Retail	2.20	32,884
PA-5	Retail, Dining and Entertainment	27.20	267,405
PA-6	Future FEZ Expansion	12.70	20,745
PA-7	Adventure Zone	7.00	11,435
PA-8	Indoors Sports	3.50	77,537
PA-9	Family Entertainment	7.00	17,424
PA-10	Family Entertainment	5.30	18,295
PA-11	Stadium	10.90	18,731
PA-12	Speed Zone/Outdoor Sports	9.00	17,424
PA-13	Parking	3.10	N.A.
PA-14	Parking	4.20	N.A.
PA-15	Parking	3.20	N.A.
PA-16	Hotel, Conference Center & Indoor Water Park	28.90	515,000
FEZ Planning Area Totals		153.90	1,071,401
Existing Big League Dreams Site		28.50	Existing
Roads / R.O.W.		28.30	
Totals		210.70	1,071,401

MANTECA FAMILY ENTERTAINMENT ZONE
Figure 2-7: Planning Areas Calculations

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MANTECA FAMILY ENTERTAINMENT ZONE

Figure 2-8: Great Wolf Lodge Resort Site Plan



SITE PLAN INFO.:

APN: 241-310-53
 PARCEL SIZE: 1,326,686 S.F., 30.53 AC.
 ZONING: POP (PUBLIC/QUASIPUBLIC)
 SITE AREA: 1,262,349 S.F., 28.98 ACRES
 PROJECT AREA: 1,262,349 S.F., 28.98 ACRES (100%)
 PROPOSED BUILDING SPACE: 202,392 S.F. (16.0%)
 PROPOSED LANDSCAPE AREA: 543,408 S.F. (43.1%)
 PROPOSED PAVED AREA: 516,546 S.F. (40.9%)
 20 HANDICAP ACCESSIBLE STALLS
 1,063 VEHICLE PARKING STALLS
 4 EXTERIOR DOCKS
 1 DRIVE-IN/DOORS
 4 TRAILER POSITIONS

CONSTRUCTION NOTES:

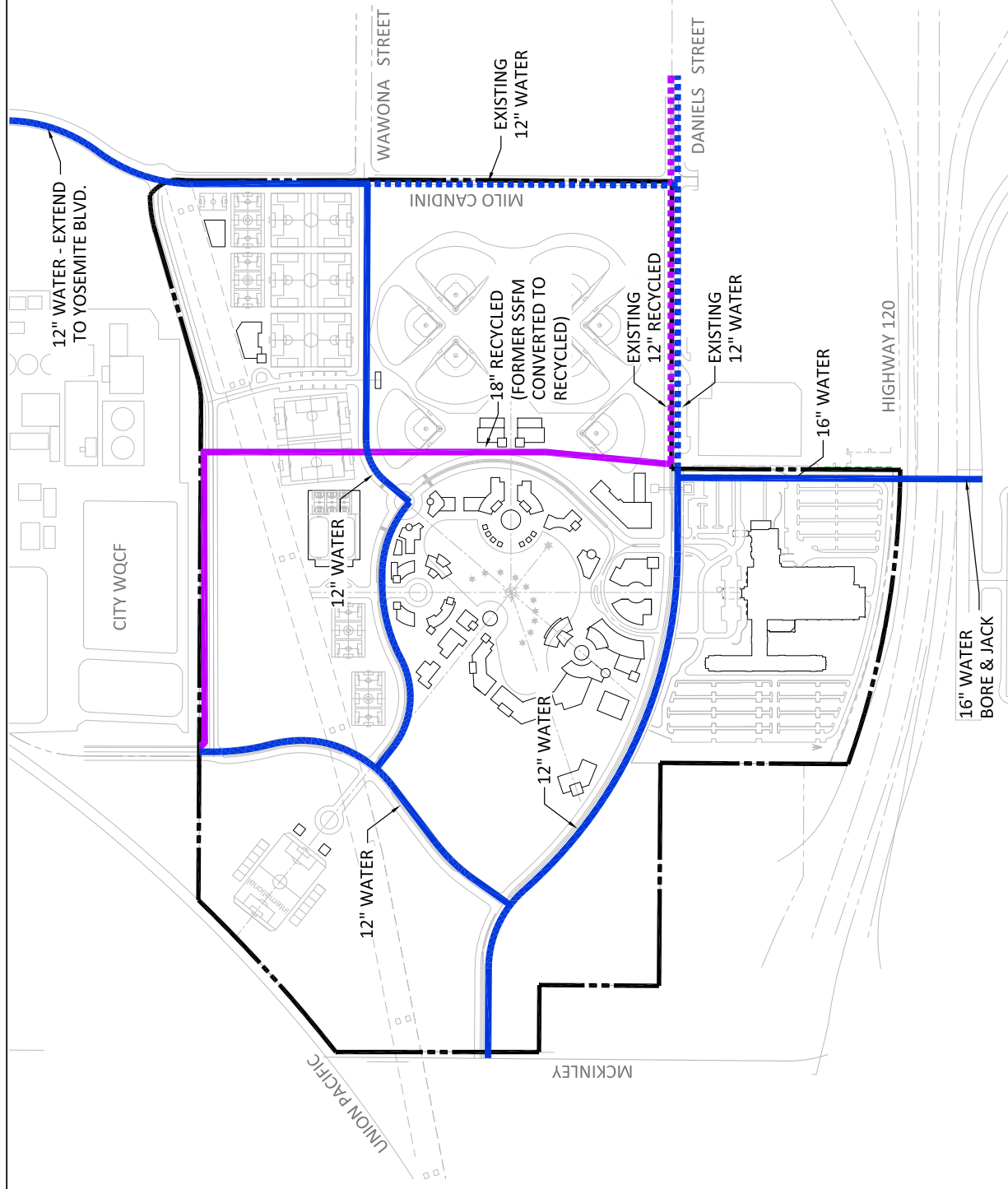
- ① RESTRICTED ACCESS
- ② 10' SETBACK
- ③ EXISTING VARIABLE WIDTH SSJID EASEMENT
- ④ 50' UTILITY CORRIDOR
- ⑤ FEZ MONUMENT SIGN PARCEL
- ⑥ FUTURE DANIELS STREET RIGHT-OF-WAY
- ⑦ EXISTING PROPERTY LINE
- ⑧ PROPOSED 30' SSJID EASEMENT
- ⑨ 26' WIDE ACCESS EASEMENT
- ⑩ NEW ASPHALT CONCRETE PAVEMENT
- ⑪ NEW GRASSY SWALE
- ⑫ NEW ADA COMPLIANT ACCESSIBLE RAMP
- ⑬ NEW P.C.C. SIDEWALK
- ⑭ EXISTING CURB REMOVAL
- ⑮ NEW PARKING LOT LIGHTING
- ⑯ PYLON SIGN
- ⑰ ENTRY SIGN



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Figure 2-9: Water System Exhibit

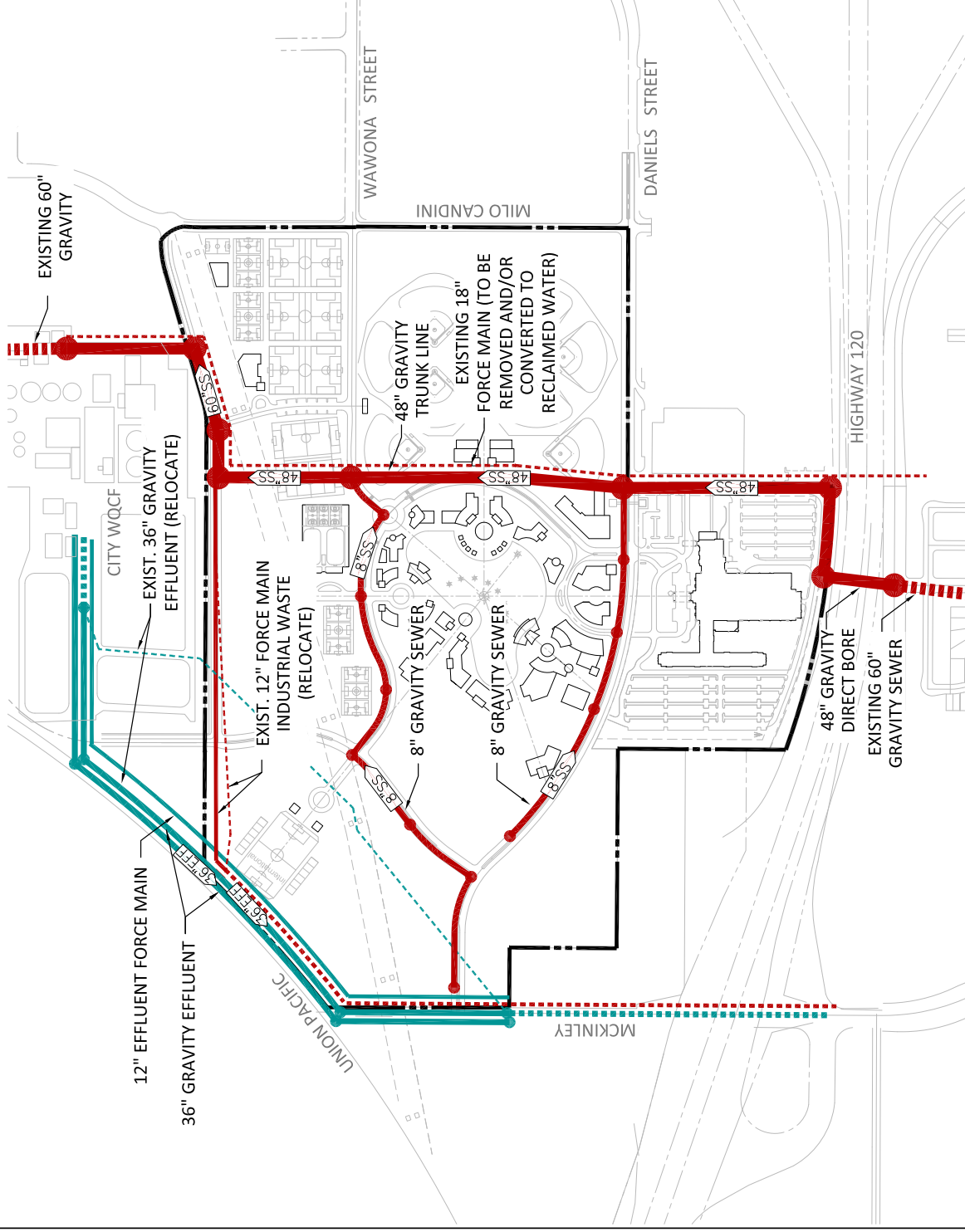
- Proposed Water
- Existing Water
- Proposed Recycled Water
- Existing Recycled Water



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Figure 2-10: Sanitary Sewer Exhibit

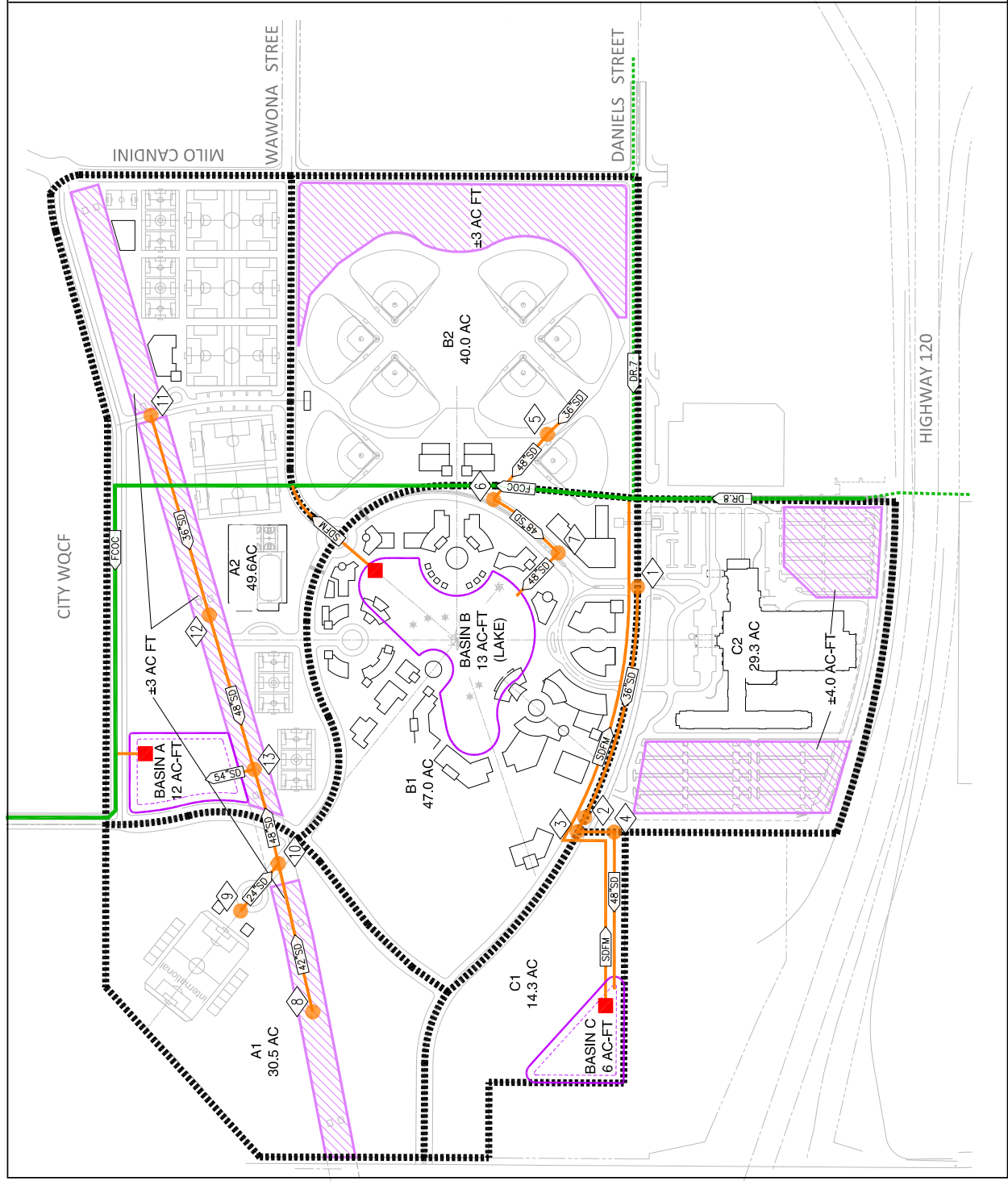
- PROPOSED SEWER
- EXISTING SEWER
- PROPOSED EFFLUENT
- EXISTING EFFLUENT
- MANHOLE OR CONTROL STRUCTURE



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Figure 2-11: Storm Drain Exhibit

- SHED AREAS
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN BASIN
- PROPOSED STORM DRAIN STORAGE AREAS
- PROPOSED IRRIGATION
- EXISTING IRRIGATION
- MANHOLE
- STORM DRAIN PUMP



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NATIVE AMERICAN HERITAGE COMMISSION

1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710
Fax (916) 373-5471

RECEIVED



November 24, 2014

DEC 01 2014

Rochelle Henson
City of Manteca
1001 W. Civic Street
Manteca, CA 95337

COMMUNITY DEVELOPMENT
DEPARTMENT

RE: SCH# 2014022008 Manteca Family Entertainment Zone, San Joaquin County.

Dear Ms. Henson,

The Native American Heritage Commission (NAHC) has reviewed the Notice of Preparation (NOP) referenced above. The California Environmental Quality Act (CEQA) states that any project that causes a substantial adverse change in the significance of an historical resource, which includes archeological resources, is a significant effect requiring the preparation of an EIR (CEQA Guidelines 15064(b)). To comply with this provision the lead agency is required to assess whether the project will have an adverse impact on historical resources within the area of project effect (APE), and if so to mitigate that effect. To adequately assess and mitigate project-related impacts to archaeological resources, the NAHC recommends the following actions:

- ✓ Contact the appropriate regional archaeological Information Center for a record search. The record search will determine:
 - If a part or all of the area of project effect (APE) has been previously surveyed for cultural resources.
 - If any known cultural resources have already been recorded on or adjacent to the APE.
 - If the probability is low, moderate, or high that cultural resources are located in the APE.
 - If a survey is required to determine whether previously unrecorded cultural resources are present.
- ✓ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
 - The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.
 - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.
- ✓ Contact the Native American Heritage Commission for:
 - A Sacred Lands File Check. **USGS 7.5-minute quadrangle name, township, range, and section required**
 - A list of appropriate Native American contacts for consultation concerning the project site and to assist in the mitigation measures. **Native American Contacts List attached**
- ✓ Lack of surface evidence of archeological resources does not preclude their subsurface existence.
 - Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) Guidelines §15064.5(f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
 - Lead agencies should include in their mitigation plan provisions for the disposition of recovered cultural items that are not burial associated, which are addressed in Public Resources Code (PRC) §5097.98, in consultation with culturally affiliated Native Americans.
 - Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, PRC §5097.98, and CEQA Guidelines §15064.5(e), address the process to be followed in the event of an accidental discovery of any human remains and associated grave goods in a location other than a dedicated cemetery.

Sincerely,

Katy Sanchez
Associate Government Program Analyst

CC: State Clearinghouse

NATIVE AMERICAN HERITAGE COMMISSION

1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710
Fax (916) 373-5471



December 5, 2014

AMENDED

RECEIVED

DEC 10 2014

COMMUNITY DEVELOPMENT
DEPARTMENT

Rochelle Henson
City of Manteca
1001 W. Civic Street
Manteca, CA 95337

RE: SCH # 2014022008 Manteca Family Entertainment Zone, San Joaquin County.

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Sincerely,

Katy Sanchez
Associate Government Program Analyst

CC: State Clearinghouse

**Native American Contacts
San Joaquin County
December 5, 2014**

Wilton Rancheria
Raymond Hitchcock, Chairperson
9728 Kent Street Miwok
Elk Grove , CA 95624
rhitchcock@wiltonrancheria-nsn.gov
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(916) 683-6015 Fax

Buena Vista Rancheria
Rhonda Morningstar Pope, Chairperson
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Sacramento , CA 95811
rhonda@buenavistatribe.
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Katherine Erolinda Perez
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canutes@verizon.net Bay Miwok
(209) 887-3415

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Silvia Burley
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Stockton , CA 95212
office@cvmt.net
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(209) 931-4333 Fax

Ione Band of Miwok Indians
Yvonne Miller, Chairperson
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Plymouth , CA 95669
administrator@ionemiwok.
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(209) 245-3112 Fax

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canutes@verizon.net Bay Miwok
(209) 887-3415

Randy Yonemura
4305 - 39th Avenue Miwok
Sacramento , CA 95824
randy_yonemura@yahoo.
(916) 421-1600
(916) 601-4069 Cell

Southern Sierra Miwuk Nation
Lois Martin, Chairperson
P.O. Box 186 Miwok
Mariposa , CA 95338 Pauite
(209) 742-6867 Office Northern Valley Yokut

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the 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.

This list is only applicable for contacting locative Americans with regard to cultural resources for the proposed SCH # 2014022008 Manteca Family Entertainment Zone, San Joaquin County.

**Native American Contacts
San Joaquin County
December 5, 2014**

Ione Band of Miwok Indians
Pamela Baumgartner, Tribal Administrator
P.O. Box 699 Miwok
Plymouth , CA 95669
pam@ionemiwok.org
(209) 245-5800 Office
(209) 245-3112 Fax

Wilton Rancheria
Steven Hutchason, Executive Director Environmental
9728 Kent Street Miwok
Elk Grove , CA 95624
shutchason@wiltonrancheria-nsn.gov
(916) 683-6000, Ext. 2006
(916) 683-6015 Fax

Ione Band of Miwok Indians
Tina Reynolds, Executive Secretary
P.O. Box 699 Miwok
Plymouth , CA 95669
tina@ionemiwok.org
(209) 245-5800 Office
(209) 245-3112 Fax

Southern Sierra Miwuk Nation
Les James, Spiritual Leader
P.O. Box 1200 Miwok
Mariposa , CA 95338 Pauite
(209) 966-3690 Northern Valley Yokut

Ione Band of Miwok Indians Cultural Committee
Anthony Burris, Chairperson
P.O. Box 699 Miwok
Plymouth , CA 95669
(209) 245-5800 Office
(209) 245-3112 Fax

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This list is only applicable for contacting locative Americans with regard to cultural resources for the proposed SCH # 2014022008 Manteca Family Entertainment Zone, San Joaquin County.



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DEC 11 2014



EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board
COMMUNITY DEVELOPMENT
DEPARTMENT

10 December 2014

Rochelle Henson
City of Manteca
1001 West Center Street
Manteca, CA 95337

CERTIFIED MAIL
7014 2120 0001 3978 3309

**COMMENTS TO NOTICE OF PREPARATION FOR THE DRAFT ENVIRONMENTAL IMPACT
REPORT, MANTECA FAMILY ENTERTAINMENT ZONE PROJECT, SCH# 2014022008,
SAN JOAQUIN COUNTY**

Pursuant to the State Clearinghouse's 14 November 2014 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Notice of Preparation for the Draft Environment Impact Report* for the Manteca Family Entertainment Zone Project, located in San Joaquin County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits¹

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/.

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 97-03-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916) 557-5250.

¹ Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACOE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

Waste Discharge Requirements

If USACOE determines that only non-jurisdictional waters of the State (i.e., “non-federal” waters of the State) are present in the proposed project area, the proposed project will require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/help/business_help/permit2.shtml.

Regulatory Compliance for Commercially Irrigated Agriculture

If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program.

There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/app_approval/index.shtml; or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov.
2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100.** Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 10-100 acres are currently \$1,084 + \$6.70/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory

Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov.

Low or Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Dewatering and Other Low Threat Discharges to Surface Waters* (Low Threat General Order) or the General Order for *Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water* (Limited Threat General Order). A complete application must be submitted to the Central Valley Water Board to obtain coverage under these General NPDES permits.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0074.pdf

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0073.pdf

If you have questions regarding these comments, please contact me at (916) 464-4684 or tcleak@waterboards.ca.gov.



Trevor Cleak
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

Neighbors United

% MIKE F. BABITZKE, INC. 6 SOUTH EL DORADO, SUITE 305 STOCKTON, CA 95202

December 15, 2014

VIA HAND DELIVERY

City of Manteca
Attn: Rochelle Henson, Senior Planner
1001 W. Center St.
Manteca, CA 95337

Re: Comments/Input regarding the November 14, 2014 Recirculated Notice of Preparation of an Environmental Impact Report and Scoping Meeting for the Manteca Family Entertainment Zone Project

Dear Ms. Henson:

As you are aware, Neighbors United ("NU") is a California non-profit corporation with a focus on growth and environmental issues.

In response to the City of Manteca's recirculation of the Notice of Preparation of an Environmental Impact Report and Scoping Meeting for Manteca Family Entertainment Zone, we submit a letter previously sent to the Manteca City Council regarding **"Working together to create more beneficial uses relating to treated reuse sewer wastewater (Manteca City Council Meeting 09/16/14, Agenda Item C.1.: Water Conservation)". (See Exhibit "1")**

It is my belief that the concerns stated in the September 16, 2014 letter directly apply to water and sewer master plan language included on pages 12, 13 and 14 of the Project Description included as Appendix "A" in the November 14, 2014 Recirculated Notice of Preparation of an Environmental Impact Report and Scoping Meeting.

Thank you for your attention to this very important matter.

Yours truly,

NEIGHBORS UNITED



Kerry Harris/President Elect

KH/jas

Enclosures:

- 1) Ex. "1": September 16, 2014 NU letter to Manteca City Council with Exhibits A through P

RECEIVED

DEC 15 2014

**BUILDING SAFETY
DEPARTMENT**

March 4, 2014

Mark Meissner
City of Manteca
Community Development Department
Planning Division
1001 West Center Street
Manteca, CA 95337

Project: Manteca Family Entertainment Zone (FEZ Project) - SCH # 2014022008

District CEQA Reference No: 20140077

Dear Mr. Meissner:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the Notice of Preparation (NOP) for the Manteca Family Entertainment Zone (FEZ Project). The proposed project consists of three (3) components: (1) the rezone of all parcels (APNs 241-31-53, 241-31-44, 241-31-18, 241-31-32 and portions of 241-31-16, 241-30-48, 241-31-48, 241-30-62 and 241-30-61) from Public/Quasi Public (PQP) to Master Plan (MP), (2) a large lot tentative parcel map for the 187 acre site, and (3) a site plan review for Phase 1 of the Project. The land is owned entirely by the City of Manteca. Development of the Family Entertainment Zone (FEZ) will include several separate distinct projects constructed in phases over an estimated period up to 15 years. Phases of development are expected to include construction of recreation facilities, ball fields, retail/commercial, and dining facilities. The initial phase is anticipated to include a 500 room hotel, an indoor waterpark, multiple recreational ball fields, and commercial facilities. The FEZ property is located on the western edge of Manteca, to the north of State Route 120 and the Stadium Shopping Center, between McKinley Avenue on its west and Airport Way on its east. The District offers the following comments:

Emissions Analysis

- 1) The District is currently designated as extreme nonattainment for the 8-hour ozone standard, attainment for PM10 and CO, and nonattainment for PM2.5 for the federal

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: 661-392-5500 FAX: 661-392-5585

air quality standards. At the state level, the District is designated as nonattainment for the 8-hour ozone, PM10, and PM2.5 air quality standards. The District recommends that the Air Quality section of the Environmental Impact Report (EIR) include a discussion of the following impacts:

- a) **Criteria Pollutants:** Project related criteria pollutant emissions should be identified and quantified. The discussion should include existing and post-project emissions.
 - i) **Construction Emissions:** Construction emissions are short-term emissions and should be evaluated separate from operational emissions. The District recommends preparation of an Environmental Impact Report (EIR) if annual construction emissions cannot be reduced or mitigated to below the following levels of significance: 10 tons per year of oxides of nitrogen (NOx), 10 tons per year of reactive organic gases (ROG), or 15 tons per year particulate matter of 10 microns or less in size (PM10).
 - (1) *Recommended Mitigation:* To reduce impacts from construction related exhaust emissions, the District recommends feasible mitigation for the project to utilize off-road construction fleets that can achieve fleet average emissions equal to or cleaner than the Tier II emission standards, as set forth in §2423 of Title 13 of the California Code of Regulations, and Part 89 of Title 40 Code of Federal Regulations. This can be achieved through any combination of uncontrolled engines and engines complying with Tier II and above engine standards.
 - ii) **Operational Emissions:** Permitted (stationary sources) and non-permitted (mobile sources) sources should be analyzed separately. The District recommends preparation of an Environmental Impact Report (EIR) if the sum of annual permitted and non-permitted emissions cannot be reduced or mitigated to below the following levels of significance: 10 tons per year of oxides of nitrogen (NOx), 10 tons per year of reactive organic gases (ROG), or 15 tons per year particulate matter of 10 microns or less in size (PM10).
 - (1) *Recommended Mitigation:* Project related impacts on air quality can be reduced through incorporation of design elements, for example, that increase energy efficiency, reduce vehicle miles traveled, and reduce construction exhaust related emissions. However, design elements and compliance with District rules and regulations may not be sufficient to reduce project related impacts on air quality to a less than significant level. Another example of a feasible mitigation measure is the mitigation

of project emissions through a Voluntary Emission Reduction Agreement (VERA). The VERA is an instrument by which the project proponent provides monies to the District, which is used by the District to fund emission reduction projects that achieve the reductions required by the lead agency. District staff is available to meet with project proponents to discuss a VERA for specific projects. For more information, or questions concerning this topic, please call District Staff at (559) 230-6000.

- iii) **Recommended Model:** Project related criteria pollutant emissions should be identified and quantified. Emissions analysis should be performed using CalEEMod (**California Emission Estimator Model**), which uses the most recent approved version of relevant Air Resources Board (ARB) emissions models and emission factors. CalEEMod is available to the public and can be downloaded from the CalEEMod website at: www.caleemod.com.
- b) **Nuisance Odors:** The project should be evaluated to determine the likelihood that the project would result in nuisance odors. Nuisance odors are subjective, thus the District has not established thresholds of significance for nuisance odors. Nuisance odors may be assessed qualitatively taking into consideration of project design elements and proximity to off-site receptors that potentially would be exposed objectionable odors.
- c) **Health Impacts:** Project related health impacts should be evaluated to determine if emissions of toxic air contaminants (TACs) will pose a significant health risk to sensitive receptors. TACs are defined as air pollutants that may cause or contribute to an increase in risk exposure to the surrounding public. The most common source of TACs can be attributed to diesel exhaust that is emitted from both stationary and mobile sources. A health impact assessment may require a screening or even a refined health risk assessment (HRA).

Prior to conducting an HRA, an applicant may perform a prioritization on all sources of emissions to determine if it is necessary to conduct a refined assessment. A prioritization is a screening assessment used to identify projects that may have a potential to significantly impact the public. If the project has a prioritization score of 10 or more, the project would exceed the District's significance threshold and a refined HRA should be performed.

If a refined HRA is to be performed, it is recommended that the project proponent contact the District to review the proposed modeling approach. The project would be considered to have a significant health risk if the HRA demonstrates that

project related health impacts assessment would exceed the District's significance threshold of 10 in a million for cancer and 1.0 for acute and chronic hazard indices.

More information on TACs, prioritizations and HRAs can be obtained by:

- E-mailing inquiries to: hramodeler@valleyair.org; or
- Visiting the District's website at:

http://www.valleyair.org/busind/pto/Tox_Resources/AirQualityMonitoring.htm.

2) In addition to the discussions on potential impacts identified above, the District recommends the EIR also include the following discussions:

- a) A discussion of the methodology, model assumptions, inputs and results used in characterizing the project's impact on air quality. To comply with CEQA requirements for full disclosure, the District recommends that the modeling outputs be provided as appendices to the EIR. The District further recommends that the District be provided with an electronic copy of all the files used to develop the modeling outputs.
- b) A discussion of the components and phases of the project and the associated emission projections, including ongoing emissions from each previous phase.
- c) A discussion of project design elements and mitigation measures, including characterization of the effectiveness of each mitigation measure incorporated into the project.
- d) A discussion of whether the project would result in a cumulatively considerable net increase of any criteria pollutant or precursor for which the San Joaquin Valley Air Basin is in non-attainment. More information on the District's attainment status can be found online by visiting the District's website at:

<http://valleyair.org/aqinfo/attainment.htm>.

District Rules and Regulations

- 3) The proposed project may be subject to District rules and regulations, including: Regulation VIII (Fugitive PM₁₀ Prohibitions), Rule 4102 (Nuisance), and Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). Per the NOP, a mobile home structure is located on the project site. In the event an existing building will be renovated, partially demolished or removed, the project may

be subject to District Rule 4002 (National Emission Standards for Hazardous Air Pollutants). If you have any questions concerning asbestos related requirements, please contact the District's Compliance Division at (209) 557-6400.

More information regarding asbestos related requirements can be obtained by:

- Visiting the District's website at <http://www.valleyair.org/busind/comply/asbestosbultn.htm> for information on asbestos requirements for demolitions, or
- Visiting the District's website at http://www.valleyair.org/busind/comply/compliance_assistance_bulletins.htm for a copy of the asbestos compliance bulletin

- 4) Based on information provided to the District, the proposed project would exceed the applicability threshold within District Rule 9510 (Indirect Source Review) of 2,000 square feet of commercial space and 20,000 square feet of recreational space. Therefore, per section 2.1 of the rule, the District concludes that the proposed project is subject to District Rule 9510.

District Rule 9510 is intended to reduce a project's impact on air quality through project design elements or mitigate its impact by payment of applicable off-site mitigation fees. Any applicant subject to District Rule 9510 is required to submit an Air Impact Assessment Application (AIA) to the District no later than applying for final discretionary approval and to pay any applicable off-site mitigation fees before issuance of the first grading / building permit, whichever comes first. Information on how to comply with District Rule 9510 can be found online at <http://www.valleyair.org/ISR/ISRHome.htm>.

The District recommends that demonstration of compliance with District Rule 9510, including payment of all applicable fees before issuance of the first grading / building permit be made a condition of project approval.

- 5) The above list of rules is neither exhaustive nor exclusive. To identify other District rules or regulations that apply to this project or to obtain information about District permit requirements, the applicant is strongly encouraged to contact the District's Small Business Assistance (SBA) Office at (209) 557-6446.

More information regarding compliance with District rules and regulation can be obtained by:

- Visiting the District's website at <http://www.valleyair.org/rules/1ruleslist.htm> for a complete listing of all current District rules and regulation

- Visiting the District's website at <http://www.valleyair.org/busind/comply/PM10/compliance PM10.htm> for information on controlling fugitive dust emissions

6) The District recommends that a copy of the District's comments be provided to the project proponent.

If you have any questions or require further information, please contact Georgia Stewart by phone at (559) 230-5937 or by e-mail at georgia.stewart@valleyair.org.

Sincerely,

David Warner
Director of Permit Services



For: Arnaud Marjollet
Permit Services Manager

DW: gs

AIR QUALITY MODELING

Manteca Family Entertainment Zone
San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	3,930.00	Space	10.50	0.00	0
City Park	87.20	Acre	55.50	139,937.00	0
City Park	12.70	Acre	12.70	20,745.00	0
City Park	12.30	Acre	12.30	35,719.00	0
High Turnover (Sit Down Restaurant)	59.71	1000sqft	4.60	59,711.00	0
Hotel	500.00	Room	28.90	365,650.00	0
Hotel	200.00	Room	0.00	149,350.00	0
Recreational Swimming Pool	75.00	1000sqft	0.00	75,000.00	0
Recreational Swimming Pool	76.00	1000sqft	0.00	76,000.00	0
Regional Shopping Center	267.40	1000sqft	27.20	267,405.00	0
Regional Shopping Center	32.88	1000sqft	2.20	32,884.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.7	Precipitation Freq (Days)	51
Climate Zone	2			Operational Year	2005

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MW/hr)	641.35	CH4 Intensity (lb/MW/hr)	0.029	N2O Intensity (lb/MW/hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and building square footage adjusted to actual. Existing BLD (28.5 acres) not included in modeling. Roads are 28.3 acres. Total
Construction Phase - Construction schedule estimate

Grading -

Area Coating - Low VOC architectural coatings

Land Use Change -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation - Low VOC architectural coatings

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialInterior	250	150
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	150
tblConstructionPhase	NumDays	220.00	80.00
tblConstructionPhase	NumDays	3,100.00	880.00
tblConstructionPhase	NumDays	310.00	45.00
tblConstructionPhase	NumDays	220.00	80.00
tblConstructionPhase	NumDays	120.00	20.00
tblConstructionPhase	PhaseEndDate	3/25/2020	4/3/2020
tblConstructionPhase	PhaseEndDate	3/31/2016	3/30/2016
tblConstructionPhase	PhaseStartDate	12/5/2019	12/15/2019
tblConstructionPhase	PhaseStartDate	1/29/2016	1/28/2016
tblGrading	AcresOfGrading	112.50	775.00
tblLandUse	LandUseSquareFeet	1,572,000.00	0.00
tblLandUse	LandUseSquareFeet	535,788.00	35,719.00
tblLandUse	LandUseSquareFeet	553,212.00	20,745.00
tblLandUse	LandUseSquareFeet	3,798,432.00	139,937.00

tbiLandUse	LandUseSquareFeet	59,710.00	59,711.00
tbiLandUse	LandUseSquareFeet	290,400.00	149,350.00
tbiLandUse	LandUseSquareFeet	726,000.00	365,650.00
tbiLandUse	LandUseSquareFeet	267,400.00	267,405.00
tbiLandUse	LandUseSquareFeet	32,880.00	32,884.00
tbiLandUse	LotAcreage	35.37	10.50
tbiLandUse	LotAcreage	87.20	55.50
tbiLandUse	LotAcreage	1.37	4.60
tbiLandUse	LotAcreage	6.67	0.00
tbiLandUse	LotAcreage	16.67	28.90
tbiLandUse	LotAcreage	1.72	0.00
tbiLandUse	LotAcreage	1.74	0.00
tbiLandUse	LotAcreage	6.14	27.20
tbiLandUse	LotAcreage	0.75	2.20
tbiProjectCharacteristics	OperationalYear	2014	2005

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.9330	7.2432	8.0815	0.0137	1.2393	0.3417	1.5809	0.3570	0.3181	0.6751	0.0000	1,174.8124	1,174.8124	0.1311	0.0000	1,177.5652
2017	0.8640	5.9963	7.9882	0.0157	0.6694	0.2738	0.9432	0.1815	0.2564	0.4379	0.0000	1,292.3371	1,292.3371	0.1019	0.0000	1,294.4768
2018	0.7671	5.3457	7.5288	0.0157	0.6719	0.2341	0.9060	0.1822	0.2193	0.4015	0.0000	1,266.6928	1,266.6928	0.0991	0.0000	1,268.7735
2019	1.7809	3.6095	5.0601	0.0108	0.4265	0.1597	0.5862	0.1156	0.1491	0.2647	0.0000	858.2909	858.2909	0.0856	0.0000	860.0884

2020	7.2399	0.0671	0.1555	4.1000e-004	0.0263	3.9500e-003	0.0302	6.9800e-003	3.9400e-003	0.0109	0.0000	28.6082	28.6082	1.5400e-003	0.0000	28.6405
Total	11.5849	22.2618	28.8141	0.0562	3.0333	1.0132	4.0465	0.8434	0.9468	1.7901	0.0000	4,620.741	4,620.7413	0.4192	0.0000	4,629.544
												3				3

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.9330	7.2432	8.0815	0.0137	0.7957	0.3417	1.1374	0.2240	0.3181	0.5420	0.0000	1,174.811	1,174.8119	0.1311	0.0000	1,177.564
2017	0.8640	5.9963	7.9882	0.0157	0.6694	0.2738	0.9432	0.1815	0.2564	0.4379	0.0000	1,292.336	1,292.3368	0.1019	0.0000	1,294.476
2018	0.7671	5.3457	7.5288	0.0157	0.6719	0.2341	0.9060	0.1822	0.2193	0.4015	0.0000	1,266.692	1,266.6924	0.0991	0.0000	1,268.773
2019	1.7809	3.6095	5.0601	0.0108	0.4265	0.1597	0.5862	0.1156	0.1491	0.2647	0.0000	858.2905	858.2905	0.0856	0.0000	860.0880
2020	7.2399	0.0671	0.1555	4.1000e-004	0.0263	3.9500e-003	0.0302	6.9800e-003	3.9400e-003	0.0109	0.0000	28.6081	28.6081	1.5400e-003	0.0000	28.6405
Total	11.5849	22.2618	28.8141	0.0562	2.5897	1.0132	3.6029	0.7103	0.9468	1.6571	0.0000	4,620.739	4,620.7397	0.4192	0.0000	4,629.542
												7				7

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	14.62	0.00	10.96	15.78	0.00	7.43	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational
Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Area	6.0568	7.3000e-004	0.0615	0.0000	2.3000e-004	2.3000e-004	2.3000e-004	2.3000e-004	0.0000	0.0939	0.0939	4.4000e-004	0.0000	0.1030
Energy	0.1339	1.2170	1.0223	7.3000e-003	0.0925	0.0925	0.0925	0.0925	0.0000	4.205.068	4.205.0682	0.1556	0.0512	4,224.219
Mobile	54.8438	161.1464	468.4098	1.1704	17.0961	5.3026	22.3988	5.0444	0.0000	30,130.06	30,130.064	3.0414	0.0000	30,193.93
Waste						0.0000	0.0000		0.0000	462.7057	0.0000	27.3451	0.0000	1,036.953
Water						0.0000	0.0000		0.0000	21.2731	264.3073	2.1969	0.0541	348.4752
Total	61.0345	162.3642	469.4935	1.1777	17.0961	5.3953	22.4915	5.0444	10.4398	483.9788	34,599.53	35,083.513	0.1053	35,803.68
										43	1			50

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.2750	7.3000e-004	0.0615	0.0000		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	0.0939	0.0939	4.4000e-004	0.0000	0.1030
Energy	0.1173	1.0665	0.8958	6.4000e-003		0.0811	0.0811		0.0811	0.0811	0.0000	3,689.316	3,689.3169	0.1366	0.0449	3,706.115
Mobile	51.1715	136.2583	407.3171	0.9704	13.7571	4.4210	18.1780	4.0592	4.4210	8.4802	0.0000	24,699.34	24,699.340	2.6055	0.0000	24,754.05
Waste						0.0000	0.0000		0.0000	0.0000	231.3529	0.0000	231.3529	13.6726	0.0000	518.4767
Water						0.0000	0.0000		0.0000	0.0000	17.0185	204.3932	221.4116	1.7572	0.0432	271.7003
Total	56.5637	137.3255	408.2744	0.9768	13.7571	4.5023	18.2593	4.0592	4.5023	8.5615	248.3713	28,593.14	28,841.516	18.1723	0.0881	29,250.45
											48	2				27

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	7.32	15.42	13.04	17.05	19.53	16.55	18.82	19.53	16.55	17.99	48.68	17.36	17.79	44.49	16.30	18.30

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	- 1,129,6400
Total	- 1,129,6400

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2016	1/28/2016	5	20	
2	Grading	Grading	1/28/2016	3/30/2016	5	45	
3	Building Construction	Building Construction	3/31/2016	8/14/2019	5	880	
4	Paving	Paving	8/15/2019	12/4/2019	5	80	
5	Architectural Coating	Architectural Coating	12/15/2019	4/3/2020	5	80	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 775

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,833,602; Non-Residential Outdoor: 611,201 (Architectural

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	483.00	200.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	97.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

Fugitive Dust				0.0705	0.0000	0.0705	0.0387	0.0000	0.0387	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5463	0.4111	3.9000e-004	0.0294	0.0294	0.0270	0.0000	0.0270	0.0000	36.8771	36.8771	0.0111	0.0000	37.1107
Total	0.0508	0.5463	0.4111	3.9000e-004	0.0705	0.0294	0.0999	0.0387	0.0270	0.0000	36.8771	36.8771	0.0111	0.0000	37.1107

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759
Total	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5464	0.0000	0.5464	0.1189	0.0000	0.1189	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1458	1.6833	1.1056	1.3900e-003	0.0807	0.0807	0.0807	0.0742	0.0742	0.0742	0.0000	130.9404	130.9404	0.0395	0.0000	131.7698
Total	0.1458	1.6833	1.1056	1.3900e-003	0.5464	0.0807	0.6271	0.1189	0.0742	0.1930	0.0000	130.9404	130.9404	0.0395	0.0000	131.7698

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6200e-003	2.0500e-003	0.0197	4.0000e-005	3.5800e-003	3.0000e-005	3.6100e-003	9.5000e-004	2.0000e-005	9.8000e-004	0.0000	3.1863	3.1863	1.6000e-004	0.0000	3.1897
Total	1.6200e-003	2.0500e-003	0.0197	4.0000e-005	3.5800e-003	3.0000e-005	3.6100e-003	9.5000e-004	2.0000e-005	9.8000e-004	0.0000	3.1863	3.1863	1.6000e-004	0.0000	3.1897

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2131	0.0000	0.2131	0.0464	0.0000	0.0464	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1458	1.6833	1.1056	1.3900e-003		0.0807	0.0807		0.0742	0.0742	0.0000	130.9402	130.9402	0.0395	0.0000	131.7697
Total	0.1458	1.6833	1.1056	1.3900e-003	0.2131	0.0807	0.2938	0.0464	0.0742	0.1205	0.0000	130.9402	130.9402	0.0395	0.0000	131.7697

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6200e-003	2.0500e-003	0.0197	4.0000e-005	3.5800e-003	3.0000e-005	3.6100e-003	9.5000e-004	2.0000e-005	9.8000e-004	3.1863	3.1863	1.6000e-004	0.0000	3.1897
Total	1.6200e-003	2.0500e-003	0.0197	4.0000e-005	3.5800e-003	3.0000e-005	3.6100e-003	9.5000e-004	2.0000e-005	9.8000e-004	3.1863	3.1863	1.6000e-004	0.0000	3.1897

3.4 Building Construction - 2016

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.3355	2.8079	1.8229	2.6400e-003		0.1938	0.1938		0.1821	0.1821	0.0000	238.5213	238.5213	0.0592	0.0000	239.7636
Total	0.3355	2.8079	1.8229	2.6400e-003		0.1938	0.1938		0.1821	0.1821	0.0000	238.5213	238.5213	0.0592	0.0000	239.7636

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2274	1.9866	2.6303	4.7000e-003	0.1282	0.0350	0.1631	0.0368	0.0321	0.0689	0.0000	427.1470	427.1470	3.7700e-003	0.0000	427.2262

Worker	0.1713	0.2162	2.0841	4.5400e-003	0.3790	2.8500e-003	0.3818	0.1008	2.6100e-003	0.1034	0.0000	336.8658	336.8658	0.0173	0.0000	337.2293
Total	0.3987	2.2028	4.7144	9.2400e-003	0.5071	0.0378	0.5449	0.1375	0.0347	0.1723	0.0000	764.0128	764.0128	0.0211	0.0000	764.4555

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3355	2.8079	1.8229	2.6400e-003		0.1938	0.1938		0.1821	0.1821	0.0000	238.5210	238.5210	0.0592	0.0000	239.7633
Total	0.3355	2.8079	1.8229	2.6400e-003		0.1938	0.1938		0.1821	0.1821	0.0000	238.5210	238.5210	0.0592	0.0000	239.7633

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2274	1.9866	2.6303	4.7000e-003	0.1282	0.0350	0.1631	0.0368	0.0321	0.0689	0.0000	427.1470	427.1470	3.7700e-003	0.0000	427.2262
Worker	0.1713	0.2162	2.0841	4.5400e-003	0.3790	2.8500e-003	0.3818	0.1008	2.6100e-003	0.1034	0.0000	336.8658	336.8658	0.0173	0.0000	337.2293
Total	0.3987	2.2028	4.7144	9.2400e-003	0.5071	0.0378	0.5449	0.1375	0.0347	0.1723	0.0000	764.0128	764.0128	0.0211	0.0000	764.4555

3.4 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3228	311.3228	0.0766	0.0000	312.9319
Total	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3228	311.3228	0.0766	0.0000	312.9319

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2630	2.3115	3.2282	6.1900e-003	0.1692	0.0387	0.2079	0.0486	0.0356	0.0841	0.0000	554.1348	554.1348	4.6100e-003	0.0000	554.2316
Worker	0.1976	0.2521	2.4033	5.9800e-003	0.5002	3.6000e-003	0.5037	0.1330	3.3100e-003	0.1363	0.0000	426.8795	426.8795	0.0207	0.0000	427.3133
Total	0.4606	2.5636	5.6315	0.0122	0.6694	0.0423	0.7116	0.1815	0.0389	0.2204	0.0000	981.0143	981.0143	0.0253	0.0000	981.5449

Mitigated Construction On-Site

	ROG	NOx	CO	SO ₂	Fugitive PM ₁₀	Exhaust PM ₁₀	PM ₁₀ Total	Fugitive PM _{2.5}	Exhaust PM _{2.5}	PM _{2.5} Total	Bio- CO ₂	NBio- CO ₂	Total CO ₂	CH ₄	N ₂ O	CO ₂ e
Category																
	tons/yr									MT/yr						

Off-Road	0.4033	3.4327	2.3568	3.4900e-003	0.2316	0.2316	0.2175	0.0000	311.3225	311.3225	0.0766	0.0000	312.9315
Total	0.4033	3.4327	2.3568	3.4900e-003	0.2316	0.2316	0.2175	0.0000	311.3225	311.3225	0.0766	0.0000	312.9315

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2630	2.3115	3.2282	6.1900e-003	0.1692	0.0367	0.2079	0.0486	0.0356	0.0841	0.0000	594.1348	594.1348	4.6100e-003	0.0000	554.2316
Worker	0.1976	0.2521	2.4033	3.9800e-003	0.5002	3.6000e-003	0.5037	0.1330	3.3100e-003	0.1363	0.0000	426.8795	426.8795	0.0207	0.0000	427.3133
Total	0.4606	2.5636	5.6315	0.0122	0.6694	0.0423	0.7116	0.1815	0.0389	0.2204	0.0000	981.0143	981.0143	0.0253	0.0000	981.5449

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723
Total	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2433	2.0841	3.1002	6.2000e-003	0.1698	0.0356	0.2054	0.0487	0.0327	0.0814	0.0000	546.6031	546.6031	4.4900e-003	0.0000	546.6974
Worker	0.1755	0.2260	2.1406	5.9800e-003	0.5021	3.5100e-003	0.5056	0.1335	3.2400e-003	0.1367	0.0000	411.1053	411.1053	0.0190	0.0000	411.5037
Total	0.4189	2.3101	5.2408	0.0122	0.6719	0.0391	0.7110	0.1822	0.0359	0.2182	0.0000	957.7084	957.7084	0.0235	0.0000	958.2011

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720
Total	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2433	2.0841	3.1002	6.2000e-003	0.1698	0.0356	0.2054	0.0487	0.0327	0.0814	546.6031	546.6031	4.4900e-003	0.0000	546.6974
Worker	0.1755	0.2260	2.1406	5.9800e-003	0.5021	3.5100e-003	0.5056	0.1335	3.2400e-003	0.1367	411.1053	411.1053	0.0190	0.0000	411.5037
Total	0.4189	2.3101	5.2408	0.0122	0.6719	0.0391	0.7110	0.1822	0.0359	0.2182	957.7084	957.7084	0.0235	0.0000	958.2011

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Off-Road	0.1905	1.6982	1.3868	2.1700e-003		0.1041	0.1041		0.0979	0.0979	0.0000	189.6394	189.6394	0.0461	0.0000	190.6084
Total	0.1905	1.6982	1.3868	2.1700e-003		0.1041	0.1041		0.0979	0.0979	0.0000	189.6394	189.6394	0.0461	0.0000	190.6084

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1412	1.1717	1.8494	3.8400e-003	0.1054	0.0203	0.1257	0.0303	0.0186	0.0489	0.0000	333.4401	333.4401	2.6900e-003	0.0000	333.4966

Worker	0.0990	0.1274	1.2019	3.7100e-003	0.3116	2.1400e-003	0.3138	0.0829	1.9900e-003	0.0848	0.0000	246.0866	246.0866	0.0109	0.0000	246.3164
Total	0.2402	1.2991	3.0514	7.5500e-003	0.4171	0.0224	0.4395	0.1131	0.0206	0.1337	0.0000	579.5267	579.5267	0.0136	0.0000	579.8131

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1905	1.6982	1.3868	2.1700e-003		0.1041	0.1041		0.0979	0.0979	0.0000	189.6392	189.6392	0.0461	0.0000	190.6082
Total	0.1905	1.6982	1.3868	2.1700e-003		0.1041	0.1041		0.0979	0.0979	0.0000	189.6392	189.6392	0.0461	0.0000	190.6082

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1412	1.1717	1.8494	3.8400e-003	0.1054	0.0203	0.1257	0.0303	0.0186	0.0489	0.0000	333.4401	333.4401	2.6900e-003	0.0000	333.4966
Worker	0.0990	0.1274	1.2019	3.7100e-003	0.3116	2.1400e-003	0.3138	0.0829	1.9900e-003	0.0848	0.0000	246.0866	246.0866	0.0109	0.0000	246.3164
Total	0.2402	1.2991	3.0514	7.5500e-003	0.4171	0.0224	0.4395	0.1131	0.0206	0.1337	0.0000	579.5267	579.5267	0.0136	0.0000	579.8131

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr											MT/yr				
Off-Road	0.0570	0.5974	0.5746	8.9000e-004		0.0324	0.0324		0.0298	0.0298	0.0000	80.1579	80.1579	0.0254	0.0000	80.6905
Paving	0.0138					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0708	0.5974	0.5746	8.9000e-004		0.0324	0.0324		0.0298	0.0298	0.0000	80.1579	80.1579	0.0254	0.0000	80.6905

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776
Total	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776

Mitigated Construction On-Site

	ROG	NOx	CO	SO ₂	Fugitive PM ₁₀	Exhaust PM ₁₀	PM ₁₀ Total	Fugitive PM _{2.5}	Exhaust PM _{2.5}	PM _{2.5} Total	Bio-CO ₂	NBio-CO ₂	Total CO ₂	CH ₄	N ₂ O	CO ₂ e
Category																
	tons/yr									MT/yr						

Off-Road	0.0570	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0298	0.0298	0.0000	80.1578	80.1578	0.0254	0.0000	80.6904
Paving	0.0138				0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0708	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0298	0.0298	0.0000	80.1578	80.1578	0.0254	0.0000	80.6904

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776
Total	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.2748					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6000e-003	0.0110	0.0111	2.0000e-005	7.7000e-004	7.7000e-004	7.7000e-004		7.7000e-004	7.7000e-004	0.0000	1.5320	1.5320	1.3000e-004	0.0000	1.5347
Total	1.2764	0.0110	0.0111	2.0000e-005	7.7000e-004	7.7000e-004	7.7000e-004		7.7000e-004	7.7000e-004	0.0000	1.5320	1.5320	1.3000e-004	0.0000	1.5347

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4700e-003	1.9000e-003	0.0179	6.0000e-005	4.6400e-003	3.0000e-005	4.6700e-003	1.2300e-003	3.0000e-005	1.2600e-003	0.0000	3.6608	3.6608	1.6000e-004	0.0000	3.6642
Total	1.4700e-003	1.9000e-003	0.0179	6.0000e-005	4.6400e-003	3.0000e-005	4.6700e-003	1.2300e-003	3.0000e-005	1.2600e-003	0.0000	3.6608	3.6608	1.6000e-004	0.0000	3.6642

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.2748					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6000e-003	0.0110	0.0111	2.0000e-005		7.7000e-004	7.7000e-004		7.7000e-004	7.7000e-004	0.0000	1.5320	1.5320	1.3000e-004	0.0000	1.5347
Total	1.2764	0.0110	0.0111	2.0000e-005		7.7000e-004	7.7000e-004		7.7000e-004	7.7000e-004	0.0000	1.5320	1.5320	1.3000e-004	0.0000	1.5347

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Worker	7.7400e-003	9.8800e-003	0.0932	3.1000e-004	0.0263	1.8000e-004	0.0265	6.9800e-003	1.7000e-004	7.1500e-003	0.0000	19.9271	19.9271	8.7000e-004	0.0000	19.9453
Total	7.7400e-003	9.8800e-003	0.0932	3.1000e-004	0.0263	1.8000e-004	0.0265	6.9800e-003	1.7000e-004	7.1500e-003	0.0000	19.9271	19.9271	8.7000e-004	0.0000	19.9453

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	7.2239					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.2300e-003	0.0573	0.0623	1.0000e-004		3.7700e-003	3.7700e-003	3.7700e-003	3.7700e-003	3.7700e-003	0.0000	8.6811	8.6811	6.7000e-004	0.0000	8.6952
Total	7.2322	0.0573	0.0623	1.0000e-004		3.7700e-003	3.7700e-003	3.7700e-003	3.7700e-003	3.7700e-003	0.0000	8.6811	8.6811	6.7000e-004	0.0000	8.6952

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7400e-003	9.8800e-003	0.0932	3.1000e-004	0.0263	1.8000e-004	0.0265	6.9800e-003	1.7000e-004	7.1500e-003	0.0000	19.9271	19.9271	8.7000e-004	0.0000	19.9453
Total	7.7400e-003	9.8800e-003	0.0932	3.1000e-004	0.0263	1.8000e-004	0.0265	6.9800e-003	1.7000e-004	7.1500e-003	0.0000	19.9271	19.9271	8.7000e-004	0.0000	19.9453

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

- Increase Transit Accessibility
- Improve Pedestrian Network
- Provide Traffic Calming Measures
- Limit Parking Supply

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	51.1715	136.2583	407.3171	0.9704	13.7571	4.4210	18.1780	4.0592	4.4210	8.4802	0.0000	24,699.3409	24,699.3409	2.6055	0.0000	24,754.0569
Unmitigated	54.8438	161.1464	468.4098	1.1704	17.0961	5.3026	22.3988	5.0444	5.3026	10.3471	0.0000	30,130.0649	30,130.0649	3.0414	0.0000	30,193.9344

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated		Mitigated	
	Weekday	Saturday	Sunday	Annual VMT		Annual VMT	
City Park	138.65	138.65	138.65	295,993		238,182	
City Park	20.19	20.19	20.19	43,109		34,689	
City Park	19.56	19.56	19.56	41,751		33,597	
High Turnover (Sit Down Restaurant)	7,592.13	9,456.27	7872.17	9,164,279		7,374,383	
Hotel	4,085.00	4,095.00	2975.00	7,462,657		6,005,109	
Hotel	1,634.00	1,638.00	1190.00	2,985,063		2,402,043	
Parking Lot	0.00	0.00	0.00				
Recreational Swimming Pool	2,469.75	1,565.25	2004.75	4,109,948		3,307,225	
Recreational Swimming Pool	2,502.68	1,586.12	2031.48	4,164,748		3,351,322	
Regional Shopping Center	11,482.16	13,361.98	6749.18	19,417,083		15,624,690	
Regional Shopping Center	1,411.87	1,643.01	829.89	2,387,561		1,921,241	
Total	31,355.98	33,524.03	23,830.86	50,072,191		40,292,481	

4.3 Trip Type Information

Land Use	Miles					Trip %			Trip Purpose %			
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	Primary	Diverted	Pass-by	
City Park	9.50	7.30	7.30	33.00	48.00	19.00			66	28	6	
City Park	9.50	7.30	7.30	33.00	48.00	19.00			66	28	6	
City Park	9.50	7.30	7.30	33.00	48.00	19.00			66	28	6	
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00			37	20	43	
Hotel	9.50	7.30	7.30	19.40	61.60	19.00			58	38	4	
Hotel	9.50	7.30	7.30	19.40	61.60	19.00			58	38	4	
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00			0	0	0	
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00			52	39	9	
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00			52	39	9	
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00			54	35	11	
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00			54	35	11	

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.430261	0.111700	0.206528	0.117220	0.023963	0.006437	0.015548	0.072795	0.000651	0.001964	0.008852	0.001211	0.002870

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

NaturalGas Mitigated	0.1173	1.0665	0.8958	6.4000e-003	0.0811	0.0811	0.0811	0.0000	1,160.9855	1,160.9856	0.0223	0.0213	1,168.0512
NaturalGas Unmitigated	0.1339	1.2170	1.0223	7.3000e-003	0.0925	0.0925	0.0925	0.0000	1,324.8821	1,324.8828	0.0254	0.0243	1,332.9459
Electricity Mitigated					0.0000	0.0000	0.0000	0.0000	2,528.3312	2,528.3313	0.1143	0.0237	2,538.0646
Electricity Unmitigated					0.0000	0.0000	0.0000	0.0000	2,880.1853	2,880.1854	0.1302	0.0269	2,891.2732

5.2 Energy by Land Use - NaturalGas

Unmitigated

	Natural/Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr															
MT/yr																	
High Turnover (Sit Down Restaurant)	6.66016e+006	0.0359	0.3265	0.2742	1.9600e-003		0.0248	0.0248		0.0248	0.0248	0.0000	355.4118	355.4118	6.8100e-003	6.5200e-003	357.5747
Hotel	1.02784e+007	0.0554	0.5038	0.4232	3.0200e-003		0.0383	0.0383		0.0383	0.0383	0.0000	548.4957	548.4957	0.0105	0.0101	551.8338
Hotel	4.19823e+006	0.0226	0.2058	0.1729	1.2300e-003		0.0156	0.0156		0.0156	0.0156	0.0000	224.0335	224.0335	4.2900e-003	4.1100e-003	225.3969
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	3.28641e+006	0.0177	0.1611	0.1353	9.7000e-004		0.0122	0.0122		0.0122	0.0122	0.0000	175.3752	175.3752	3.3600e-003	3.2200e-003	176.4425
Regional Shopping Center	404144	2.1800e-003	0.0198	0.0166	1.2000e-004		1.5100e-003	1.5100e-003		1.5100e-003	1.5100e-003	0.0000	21.5667	21.5667	4.1000e-004	4.0000e-004	21.6979
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.1339	1.2170	1.0223	7.3000e-003		0.0925	0.0925		0.0925	0.0925	0.0000	1,324.8828	1,324.8828	0.0254	0.0243	1,332.9459

Mitigated

Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational	0	0.0000	0.0000	0.0000	0.0000
Swimming Pool					
Regional Shopping Center	3.58055e+006	1,041.6239	0.0471	9.7400e-003	1,045.6338
Regional Shopping Center	440317	128.0932	5.7900e-003	1.2000e-003	128.5863
Total		2,880.1854	0.1302	0.0269	2,891.2732

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
High Turnover (Sit Down Restaurant)	1.8595e+006	540.9487	0.0245	5.0600e-003	543.0312
Hotel	2.37468e+006	690.8209	0.0312	6.4600e-003	693.4803
Hotel	969939	282.1663	0.0128	2.6400e-003	283.2525
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational	0	0.0000	0.0000	0.0000	0.0000
Swimming Pool					
Regional Shopping Center	3.10511e+006	903.3112	0.0409	8.4500e-003	906.7887
Regional Shopping Center	381849	111.0843	5.0200e-003	1.0400e-003	111.5119
Total		2,528.3313	0.1143	0.0237	2,538.0646

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior
Use Low VOC Paint - Residential Exterior
Use Low VOC Paint - Non-Residential Interior
Use Low VOC Paint - Non-Residential Exterior
No Hearths Installed
Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.2750	7.3000e-004	0.0615	0.0000		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	0.0939	0.0939	4.4000e-004	0.0000	0.1030
Unmitigated	6.0568	7.3000e-004	0.0615	0.0000		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	0.0939	0.0939	4.4000e-004	0.0000	0.1030

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.2748					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.7741					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.9400e-003	7.3000e-004	0.0615	0.0000		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	0.0939	0.0939	4.4000e-004	0.0000	0.1030
Total	6.0568	7.3000e-004	0.0615	0.0000		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	0.0939	0.0939	4.4000e-004	0.0000	0.1030

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.8499					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.4172					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.9400e-003	7.3000e-004	0.0615	0.0000		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	0.0939	0.0939	4.4000e-004	0.0000	0.1030
Total	5.2750	7.3000e-004	0.0615	0.0000		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	0.0939	0.0939	4.4000e-004	0.0000	0.1030

7.0 Water Detail

7.1 Mitigation Measures Water

- Apply Water Conservation Strategy
- Use Reclaimed Water
- Install Low Flow Bathroom Faucet
- Install Low Flow Kitchen Faucet
- Install Low Flow Toilet
- Install Low Flow Shower
- Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Unmitigated	285.5804	2.1969	0.0541	348.4752

Mitigated	221.4116	1.7572	0.0432	271.7003

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 133.684	136.1159	6.1500e-003	1.2700e-003	136.6400
High Turnover (Sit Down Restaurant)	18.124 / 1.15685	35.4572	0.5919	0.0142	52.2964
Hotel	17.7567 / 1.97297	35.5935	0.5800	0.0139	52.0948
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	8.93061 / 5.4736	22.4643	0.2919	7.0500e-003	30.7811
Regional Shopping Center	22.2425 / 13.6325	55.9494	0.7270	0.0176	76.6630
Total		285.5804	2.1969	0.0541	348.4752

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 106.947	108.8928	4.9200e-003	1.0200e-003	109.3120
High Turnover (Sit Down Restaurant)	14.4992 / 0.925481	26.4595	0.4735	0.0114	39.9235

Hotel	14.2054 /	26.6072	0.4639	0.0111	39.8010
	1.57838				
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational	7.14449 /	17.0321	0.2335	5.6400e-	23.6819
Swimming Pool	4.37888			003	
Regional Shopping Center	17.794 /	42.4201	0.5815	0.0140	58.9820
	10.906				
Total		221.4117	1.7572	0.0432	271.7003

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	231.3529	13.6726	0.0000	518.4767
Unmitigated	462.7057	27.3451	0.0000	1,036.9533

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

City Park	9.65	1.9589	0.1158	0.0000	4.3899
High Turnover (Sit Down Restaurant)	710.55	144.2352	8.5241	0.0000	323.2404
Hotel	383.25	77.7963	4.5976	0.0000	174.3465
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	860.7	174.7143	10.3253	0.0000	391.5461
Regional Shopping Center	315.29	64.0010	3.7824	0.0000	143.4304
Total		462.7057	27.3451	0.0000	1,036.9533
					3

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	4.825	0.9794	0.0579	0.0000	2.1950
High Turnover (Sit Down Restaurant)	355.275	72.1176	4.2620	0.0000	161.6202
Hotel	191.625	38.8981	2.2988	0.0000	87.1733
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	430.35	87.3572	5.1627	0.0000	195.7730
Regional Shopping Center	157.645	32.0005	1.8912	0.0000	71.7152
Total		231.3529	13.6726	0.0000	518.4767

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	-	0.0000	0.0000	-
	1,129.6400			1,129.640

10.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Cropland	182.2 / 0	-	0.0000	0.0000	-
		1,129.6400			1,129.640
Total		-	0.0000	0.0000	-
		1,129.6400			1,129.640
					0

Manteca Family Entertainment Zone

San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	3,930.00	Space	10.50	0.00	0
City Park	87.20	Acre	55.50	139,937.00	0
City Park	12.70	Acre	12.70	20,745.00	0
City Park	12.30	Acre	12.30	35,719.00	0
High Turnover (Sit Down Restaurant)	59.71	1000sqft	4.60	59,711.00	0
Hotel	500.00	Room	28.90	365,650.00	0
Hotel	200.00	Room	0.00	149,350.00	0
Recreational Swimming Pool	75.00	1000sqft	0.00	75,000.00	0
Recreational Swimming Pool	76.00	1000sqft	0.00	76,000.00	0
Regional Shopping Center	267.40	1000sqft	27.20	267,405.00	0
Regional Shopping Center	32.88	1000sqft	2.20	32,884.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.7	Precipitation Freq (Days)	51
Climate Zone	2			Operational Year	2015

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MW/hr)	641.35	CH4 Intensity (lb/MW/hr)	0.029	N2O Intensity (lb/MW/hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and building square footage adjusted to actual. Existing BLD (28.5 acres) not included in modeling. Roads are 28.3 acres. Total project with BLD and roads is 240.7 acres.

Construction Phase - Construction schedule estimate

Grading -

Area Coating - Low VOC architectural coatings

Land Use Change -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation - Low VOC architectural coatings

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tbiConstructionPhase	NumDays	220.00	80.00
tbiConstructionPhase	NumDays	3,100.00	880.00
tbiConstructionPhase	NumDays	310.00	45.00
tbiConstructionPhase	NumDays	220.00	80.00
tbiConstructionPhase	NumDays	120.00	20.00
tbiConstructionPhase	PhaseEndDate	3/31/2016	3/30/2016
tbiConstructionPhase	PhaseStartDate	1/29/2016	1/28/2016
tbiGrading	AcresOfGrading	112.50	775.00
tbiLandUse	LandUseSquareFeet	1,572,000.00	0.00
tbiLandUse	LandUseSquareFeet	535,788.00	35,719.00
tbiLandUse	LandUseSquareFeet	553,212.00	20,745.00
tbiLandUse	LandUseSquareFeet	3,798,432.00	139,937.00
tbiLandUse	LandUseSquareFeet	59,710.00	59,711.00
tbiLandUse	LandUseSquareFeet	290,400.00	149,350.00
tbiLandUse	LandUseSquareFeet	726,000.00	365,650.00
tbiLandUse	LandUseSquareFeet	267,400.00	267,405.00
tbiLandUse	LandUseSquareFeet	32,880.00	32,884.00
tbiLandUse	LotAcreage	35.37	10.50

tbiLandUse	LotAcreage	87.20	55.50
tbiLandUse	LotAcreage	1.37	4.60
tbiLandUse	LotAcreage	6.67	0.00
tbiLandUse	LotAcreage	16.67	28.90
tbiLandUse	LotAcreage	1.72	0.00
tbiLandUse	LotAcreage	1.74	0.00
tbiLandUse	LotAcreage	6.14	27.20
tbiLandUse	LotAcreage	0.75	2.20
tbiProjectCharacteristics	OperationalYear	2014	2015

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
tons/yr																
MT/yr																
2016	0.9330	7.2432	8.0815	0.0137	1.2393	0.3417	1.5809	0.3570	0.3181	0.6751	0.0000	1,174.8124	1,174.8124	0.1311	0.0000	1,177.5652
2017	0.8640	5.9963	7.9882	0.0157	0.6694	0.2738	0.9432	0.1815	0.2564	0.4379	0.0000	1,292.3371	1,292.3371	0.1019	0.0000	1,294.4768
2018	0.7671	5.3457	7.5288	0.0157	0.6719	0.2341	0.9060	0.1822	0.2193	0.4015	0.0000	1,266.6928	1,266.6928	0.0991	0.0000	1,268.7735
2019	2.5263	3.6170	5.0770	0.0108	0.4292	0.1602	0.5893	0.1163	0.1496	0.2659	0.0000	861.3200	861.3200	0.0858	0.0000	863.1211
2020	6.4946	0.0602	0.1395	3.7000e-004	0.0236	3.5400e-003	0.0271	6.2700e-003	3.5300e-003	9.8000e-003	0.0000	25.6632	25.6632	1.3800e-003	0.0000	25.6922
Total	11.5850	22.2624	28.8150	0.0562	3.0333	1.0133	4.0465	0.8434	0.9468	1.7902	0.0000	4,620.8254	4,620.8254	0.4192	0.0000	4,629.6287

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr															
2016	0.9330	7.2432	8.0815	0.0137	0.7957	0.3417	1.1374	0.2240	0.3181	0.5420	0.0000	1,174.8119	1,174.8119	0.1311	0.0000	1,177.5647
2017	0.8640	5.9963	7.9882	0.0157	0.6694	0.2738	0.9432	0.1815	0.2564	0.4379	0.0000	1,292.3368	1,292.3368	0.1019	0.0000	1,294.4764
2018	0.7671	5.3457	7.5288	0.0157	0.6719	0.2341	0.9060	0.1822	0.2193	0.4015	0.0000	1,266.6924	1,266.6924	0.0991	0.0000	1,268.7731
2019	2.5263	3.6170	5.0770	0.0108	0.4292	0.1602	0.5893	0.1163	0.1496	0.2659	0.0000	861.3197	861.3197	0.0858	0.0000	863.1207
2020	6.4946	0.0602	0.1395	3.7000e-004	0.0236	3.5400e-003	0.0271	6.2700e-003	3.5300e-003	9.8000e-003	0.0000	25.6632	25.6632	1.3800e-003	0.0000	25.6922
Total	11.5850	22.2624	28.8150	0.0562	2.5897	1.0133	3.6030	0.7103	0.9468	1.6571	0.0000	4,620.8239	4,620.8239	0.4192	0.0000	4,629.6271

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	14.62	0.00	10.96	15.78	0.00	7.43	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Area	5.6289	4.8000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.0939	0.0939	2.7000e-004	0.0000	0.0996
Energy	0.1339	1.2170	1.0223	7.3000e-003		0.0925	0.0925		0.0925	0.0925	0.0000	4,205.0682	4,205.0682	0.1556	0.0512	4,224.2191
Mobile	23.2815	58.2203	218.2836	0.3093	18.8376	0.7690	19.6067	5.0514	0.7061	5.7575	0.0000	25,444.1777	25,444.1777	1.0729	0.0000	25,466.7090
Waste						0.0000	0.0000		0.0000	0.0000	462.7057	0.0000	462.7057	27.3451	0.0000	1,036.9533

Water						0.0000			0.0000					0.0000		21.2731		264.3073		285.5804		2.1969		0.0541		348.4752
Total	29.0442	59.4378	219.3558	0.3166	18.8376	0.8617	19.6993	5.0514	0.7988	5.8502	483.9788	29,913.64	30,397.625	30.7708	0.1053			71	9					0.1053		31,076.45
																										62

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr											MT/yr				
Area	5.2720	4.8000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.0939	0.0939	2.7000e-004	0.0000	0.0996
Energy	0.1173	1.0665	0.8958	6.4000e-003		0.0811	0.0811		0.0811	0.0811	0.0000	3.689.3169	3.689.3169	0.1366	0.0449	3,706.1158
Mobile	22.2451	49.4679	197.7218	0.2524	15.1584	0.6326	15.7910	4.0648	0.5807	4.6455	0.0000	20,741.5591	20,741.5591	0.9045	0.0000	20,760.5543
Waste						0.0000	0.0000		0.0000	0.0000	231.3529	0.0000	231.3529	13.6726	0.0000	518.4767
Water						0.0000	0.0000		0.0000	0.0000	17.0185	204.3932	221.4116	1.7572	0.0432	271.7003
Total	27.6343	50.5348	198.6676	0.2588	15.1584	0.7138	15.8722	4.0648	0.6619	4.7267	248.3713	24,635.3630	24,883.7344	16.4711	0.0881	25,256.9467

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	4.85	14.98	9.43	18.26	19.53	17.16	19.43	19.53	17.13	19.20	48.68	17.65	18.14	46.47	16.30	18.73

2.3 Vegetation
Vegetation

	CO2e

Category	MT
Vegetation Land Change	-1,129,6400
Total	-1,129,6400

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2016	1/28/2016	5	20	
2	Grading	Grading	1/28/2016	3/30/2016	5	45	
3	Building Construction	Building Construction	3/31/2016	8/14/2019	5	880	
4	Paving	Paving	8/15/2019	12/4/2019	5	80	
5	Architectural Coating	Architectural Coating	12/5/2019	3/25/2020	5	80	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 775

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,833,602; Non-Residential Outdoor: 611,201 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48

Fugitive Dust				0.1807	0.0000	0.1807	0.0993	0.0000	0.0993	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5463	0.4111	3.9000e-004	0.0294	0.0294		0.0270	0.0270	0.0000	36.8771	36.8771	0.0111	0.0000	37.1107
Total	0.0508	0.5463	0.4111	3.9000e-004	0.0294	0.0294	0.0993	0.0270	0.1264	0.0000	36.8771	36.8771	0.0111	0.0000	37.1107

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759
Total	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0705	0.0000	0.0705	0.0387	0.0000	0.0387	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5463	0.4111	3.9000e-004	0.0294	0.0294	0.0294	0.0270	0.0270	0.0270	0.0000	36.8771	36.8771	0.0111	0.0000	37.1107
Total	0.0508	0.5463	0.4111	3.9000e-004	0.0705	0.0294	0.0999	0.0387	0.0270	0.0658	0.0000	36.8771	36.8771	0.0111	0.0000	37.1107

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759
Total	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5464	0.0000	0.5464	0.1189	0.0000	0.1189	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1458	1.6833	1.1056	1.3900e-003		0.0807	0.0807		0.0742	0.0742	0.0000	130.9404	130.9404	0.0395	0.0000	131.7698
Total	0.1458	1.6833	1.1056	1.3900e-003	0.5464	0.0807	0.6271	0.1189	0.0742	0.1930	0.0000	130.9404	130.9404	0.0395	0.0000	131.7698

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Worker	1.6200e-003	2.0500e-003	0.0197	4.0000e-005	3.5800e-003	3.0000e-005	3.6100e-003	9.5000e-004	2.0000e-005	9.8000e-004	0.0000	3.1863	3.1863	1.6000e-004	0.0000	3.1897
Total	1.6200e-003	2.0500e-003	0.0197	4.0000e-005	3.5800e-003	3.0000e-005	3.6100e-003	9.5000e-004	2.0000e-005	9.8000e-004	0.0000	3.1863	3.1863	1.6000e-004	0.0000	3.1897

3.4 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3355	2.8079	1.8229	2.6400e-003		0.1938	0.1938	0.1821	0.1821	0.1821	0.0000	238.5213	238.5213	0.0592	0.0000	239.7636
Total	0.3355	2.8079	1.8229	2.6400e-003		0.1938	0.1938	0.1821	0.1821	0.1821	0.0000	238.5213	238.5213	0.0592	0.0000	239.7636

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2274	1.9866	2.6303	4.7000e-003	0.1282	0.0350	0.1631	0.0368	0.0321	0.0689	0.0000	427.1470	427.1470	3.7700e-003	0.0000	427.2262
Worker	0.1713	0.2162	2.0841	4.5400e-003	0.3790	2.8500e-003	0.3818	0.1008	2.6100e-003	0.1034	0.0000	336.8658	336.8658	0.0173	0.0000	337.2293
Total	0.3987	2.2028	4.7144	9.2400e-003	0.5071	0.0378	0.5449	0.1375	0.0347	0.1723	0.0000	764.0128	764.0128	0.0211	0.0000	764.4555

Mitigated Construction On-Site

Off-Road	0.4033	3.4327	2.3568	3.4900e-003	0.2316	0.2316	0.2175	0.2175	0.0000	311.3228	311.3228	0.0766	0.0000	312.9319
Total	0.4033	3.4327	2.3568	3.4900e-003	0.2316	0.2316	0.2175	0.2175	0.0000	311.3228	311.3228	0.0766	0.0000	312.9319

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2630	2.3115	3.2282	6.1900e-003	0.1692	0.0387	0.2079	0.0486	0.0356	0.0841	0.0000	554.1346	554.1348	4.6100e-003	0.0000	554.2316
Worker	0.1976	0.2521	2.4033	5.9800e-003	0.5002	3.6000e-003	0.5037	0.1330	3.3100e-003	0.1363	0.0000	426.8795	426.8795	0.0207	0.0000	427.3133
Total	0.4606	2.5636	5.6315	0.0122	0.6694	0.0423	0.7116	0.1815	0.0389	0.2204	0.0000	981.0143	981.0143	0.0253	0.0000	981.5449

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3225	311.3225	0.0766	0.0000	312.9315
Total	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3225	311.3225	0.0766	0.0000	312.9315

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2630	2.3115	3.2282	6.1900e-003	0.1692	0.0387	0.2079	0.0486	0.0356	0.0841	0.0000	554.1348	554.1348	4.6100e-003	0.0000	554.2316
Worker	0.1976	0.2521	2.4033	5.9800e-003	0.5002	3.6000e-003	0.5037	0.1330	3.3100e-003	0.1363	0.0000	426.8795	426.8795	0.0207	0.0000	427.3133
Total	0.4606	2.5636	5.6315	0.0122	0.6694	0.0423	0.7116	0.1815	0.0389	0.2204	0.0000	981.0143	981.0143	0.0253	0.0000	981.5449

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723
Total	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2433	2.0841	3.1002	6.2000e-003	0.1698	0.0356	0.2054	0.0487	0.0327	0.0814	546.6031	546.6031	4.4900e-003	0.0000	546.6974
Worker	0.1755	0.2260	2.1406	5.9800e-003	0.5021	3.5100e-003	0.5056	0.1335	3.2400e-003	0.1367	0.0000	411.1053	411.1053	0.0190	411.5037
Total	0.4189	2.3101	5.2408	0.0122	0.6719	0.0391	0.7110	0.1822	0.0359	0.2182	0.0000	957.7084	957.7084	0.0235	958.2011

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720
Total	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2433	2.0841	3.1002	6.2000e-003	0.1698	0.0356	0.2054	0.0487	0.0327	0.0814	0.0000	546.6031	546.6031	4.4900e-003	0.0000	546.6974

Worker	0.1755	0.2260	2.1406	5.9800e-003	0.5021	3.5100e-003	0.5056	0.1335	3.2400e-003	0.1367	0.0000	411.1053	411.1053	0.0190	0.0000	411.5037
Total	0.4189	2.3101	5.2408	0.0122	0.6719	0.0391	0.7110	0.1822	0.0339	0.2182	0.0000	957.7084	957.7084	0.0235	0.0000	958.2011

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Off-Road	0.1905	1.6982	1.3868	2.1700e-003	0.1041	0.1041	0.1041	0.0979	0.0979	0.0979	0.0000	189.6394	189.6394	0.0461	0.0000	190.6084
Total	0.1905	1.6982	1.3868	2.1700e-003	0.1041	0.1041	0.1041	0.0979	0.0979	0.0979	0.0000	189.6394	189.6394	0.0461	0.0000	190.6084

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1412	1.1717	1.8494	3.8400e-003	0.1054	0.0203	0.1257	0.0303	0.0186	0.0489	0.0000	333.4401	333.4401	2.6900e-003	0.0000	333.4966
Worker	0.0990	0.1274	1.2019	3.7100e-003	0.3116	2.1400e-003	0.3138	0.0829	1.9900e-003	0.0848	0.0000	246.0866	246.0866	0.0109	0.0000	246.3164
Total	0.2402	1.2991	3.0514	7.5500e-003	0.4171	0.0224	0.4395	0.1131	0.0206	0.1337	0.0000	579.5267	579.5267	0.0136	0.0000	579.8131

Mitigated Construction On-Site

Off-Road	0.0570	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0298	0.0298	0.0000	80.1579	80.1579	0.0254	0.0000	80.6905
Paving	0.0138				0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0708	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0298	0.0298	0.0000	80.1579	80.1579	0.0254	0.0000	80.6905

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776
Total	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0570	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0324	0.0298	0.0298	0.0298	0.0000	80.1578	80.1578	0.0254	0.0000	80.6904
Paving	0.0138				0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0708	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0324	0.0298	0.0298	0.0298	0.0000	80.1578	80.1578	0.0254	0.0000	80.6904

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776
Total	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.0185					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5300e-003	0.0174	0.0175	3.0000e-005		1.2200e-003	1.2200e-003		1.2200e-003	1.2200e-003	0.0000	2.4256	2.4256	2.0000e-004	0.0000	2.4299
Total	2.0210	0.0174	0.0175	3.0000e-005		1.2200e-003	1.2200e-003		1.2200e-003	1.2200e-003	0.0000	2.4256	2.4256	2.0000e-004	0.0000	2.4299

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Worker	2.3300e-003	3.000e-003	0.0283	9.0000e-005	7.3400e-003	5.0000e-005	7.3900e-003	1.9500e-003	5.0000e-005	2.0000e-003	0.0000	5.7963	5.7963	2.6000e-004	0.0000	5.8017
Total	2.3300e-003	3.000e-003	0.0283	9.0000e-005	7.3400e-003	5.0000e-005	7.3900e-003	1.9500e-003	5.0000e-005	2.0000e-003	0.0000	5.7963	5.7963	2.6000e-004	0.0000	5.8017

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.4803					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.3900e-003	0.0514	0.0559	9.0000e-005	3.3800e-003	3.3800e-003	3.3800e-003	3.3800e-003	3.3800e-003	3.3800e-003	0.0000	7.7874	7.7874	6.0000e-004	0.0000	7.8001
Total	6.4877	0.0514	0.0559	9.0000e-005	3.3800e-003	3.3800e-003	3.3800e-003	3.3800e-003	3.3800e-003	3.3800e-003	0.0000	7.7874	7.7874	6.0000e-004	0.0000	7.8001

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9400e-003	8.8600e-003	0.0836	2.8000e-004	0.0236	1.6000e-004	0.0237	6.2700e-003	1.5000e-004	6.4100e-003	0.0000	17.8758	17.8758	7.8000e-004	0.0000	17.8921
Total	6.9400e-003	8.8600e-003	0.0836	2.8000e-004	0.0236	1.6000e-004	0.0237	6.2700e-003	1.5000e-004	6.4100e-003	0.0000	17.8758	17.8758	7.8000e-004	0.0000	17.8921

Mitigated Construction On-Site

	Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
		tons/yr															
		MT/yr															
	Archit. Coating	6.4803					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Off-Road	7.3900e-003	0.0514	0.0559	9.0000e-005		3.3800e-003	3.3800e-003		3.3800e-003	3.3800e-003	0.0000	7.7874	7.7874	6.0000e-004	0.0000	7.8001
	Total	6.4877	0.0514	0.0559	9.0000e-005		3.3800e-003	3.3800e-003		3.3800e-003	3.3800e-003	0.0000	7.7874	7.7874	6.0000e-004	0.0000	7.8001

Mitigated Construction Off-Site

	Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
		tons/yr															
		MT/yr															
	Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Worker	6.9400e-003	8.8600e-003	0.0836	2.8000e-004	0.0236	1.6000e-004	0.0237	6.2700e-003	1.5000e-004	6.4100e-003	0.0000	17.8758	17.8758	7.8000e-004	0.0000	17.8921
	Total	6.9400e-003	8.8600e-003	0.0836	2.8000e-004	0.0236	1.6000e-004	0.0237	6.2700e-003	1.5000e-004	6.4100e-003	0.0000	17.8758	17.8758	7.8000e-004	0.0000	17.8921

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

- Increase Transit Accessibility
- Improve Pedestrian Network
- Provide Traffic Calming Measures

Limit Parking Supply

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	22.2451	49.4679	197.7218	0.2524	15.1584	0.6326	15.7910	4.0648	0.5807	4.6455	0.0000	20,741.55	20,741.559	0.9045	0.0000	20,760.55
Unmitigated	23.2815	58.2203	218.2836	0.3093	18.8376	0.7690	19.6067	5.0514	0.7061	5.7575	0.0000	25,444.17	25,444.177	1.0729	0.0000	25,466.70
												77	7			90

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated		Mitigated	
	Weekday	Saturday	Sunday	Annual VMT		Annual VMT	
City Park	138.65	138.65	138.65	295,993		238,182	
City Park	20.19	20.19	20.19	43,109		34,689	
City Park	19.56	19.56	19.56	41,751		33,597	
High Turnover (Sit Down Restaurant)	7,592.13	9,456.27	7872.17	9,164,279		7,374,383	
Hotel	4,085.00	4,095.00	2975.00	7,462,657		6,005,109	
Hotel	1,634.00	1,638.00	1190.00	2,985,063		2,402,043	
Parking Lot	0.00	0.00	0.00				
Recreational Swimming Pool	2,469.75	1,565.25	2004.75	4,109,948		3,307,225	
Recreational Swimming Pool	2,502.68	1,586.12	2031.48	4,164,748		3,351,322	
Regional Shopping Center	11,482.16	13,361.98	6749.18	19,417,083		15,624,690	
Regional Shopping Center	1,411.87	1,643.01	829.89	2,387,561		1,921,241	
Total	31,355.98	33,524.03	23,830.86	50,072,191		40,292,481	

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
High Turnover (Sit Down Restaurant)	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43

Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.464542	0.064819	0.160074	0.168695	0.045387	0.006034	0.016996	0.061548	0.001122	0.001498	0.006308	0.000655	0.002321

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Natural Gas Mitigated	0.1173	1.0665	0.8958	6.4000e-003		0.0811	0.0811	0.0811		0.0811	0.0000	1,160.9856	1,160.9856	0.0223	0.0213	1,168.0512
Natural Gas Unmitigated	0.1339	1.2170	1.0223	7.3000e-003		0.0925	0.0925	0.0925		0.0925	0.0000	1,324.8828	1,324.8828	0.0254	0.0243	1,332.9459
Electricity Mitigated						0.0000	0.0000	0.0000		0.0000	0.0000	2,528.3312	2,528.3313	0.1143	0.0237	2,538.0646
Electricity Unmitigated						0.0000	0.0000	0.0000		0.0000	0.0000	2,880.1852	2,880.1854	0.1302	0.0269	2,891.2732

5.2 Energy by Land Use - NaturalGas

Unmitigated

	Natural/Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr															
		MT/yr															
High Turnover (Sit Down Restaurant)	6.66E+06	0.0359	0.3265	0.2742	1.9600e-003		0.0248	0.0248		0.0248	0.0248	0.0000	355.4118	355.4118	6.8100e-003	6.5200e-003	357.5747
Hotel	1.03E+07	0.0554	0.5038	0.4232	3.0200e-003		0.0383	0.0383		0.0383	0.0383	0.0000	548.4957	548.4957	0.0105	0.0101	551.8338
Hotel	4.20E+06	0.0226	0.2058	0.1729	1.2300e-003		0.0156	0.0156		0.0156	0.0156	0.0000	224.0335	224.0335	4.2900e-003	4.1100e-003	225.3969
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	3.29E+06	0.0177	0.1611	0.1353	9.7000e-004		0.0122	0.0122		0.0122	0.0122	0.0000	175.3752	175.3752	3.3600e-003	3.2200e-003	176.4425
Regional Shopping Center	4.04E+05	2.1800e-003	0.0198	0.0166	1.2000e-004		1.5100e-003	1.5100e-003		1.5100e-003	1.5100e-003	0.0000	21.5667	21.5667	4.1000e-004	4.0000e-004	21.6879
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	24,827,344.00	0.1339	1.2170	1.0223	7.3000e-003		0.0925	0.0925		0.0925	0.0925	0.0000	1,324.8828	1,324.8828	0.0254	0.0243	1,332.9459

Mitigated

	Natural/Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e		
Land Use	kBTU/yr	tons/yr															MT/yr		
High Turnover (Sit Down Restaurant)	6.28E+06	0.0339	0.3077	0.2585	1.8500e-003		0.0234	0.0234		0.0234	0.0234	0.0000	334.9981	334.9981	6.4200e-003	6.1400e-003	337.0368		
Hotel	3.57E+06	0.0193	0.1752	0.1472	1.0500e-003		0.0133	0.0133		0.0133	0.0133	0.0000	190.7393	190.7393	3.6600e-003	3.5000e-003	191.9001		

Hotel	8.75E+06	0.0472	0.4290	0.3603	2.5700e-003	0.0326	0.0326	0.0000	466.9823	466.9823	8.9500e-003	8.5600e-003	469.8243
Parking Lot	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	2.81E+06	0.0151	0.1376	0.1156	8.3000e-004	0.0105	0.0105	0.0000	149.8395	149.8395	2.8700e-003	2.7500e-003	150.7514
Regional Shopping Center	3.45E+05	1.8600e-003	0.0169	0.0142	1.0000e-004	1.2900e-003	1.2900e-003	0.0000	18.4264	18.4264	3.5000e-004	3.4000e-004	18.5386
City Park	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	21,756,058.00	0.1173	1.0665	0.8958	6.4000e-003	0.0811	0.0811	0.0000	1,160.9856	1,160.985	0.0223	0.0213	1,168.0512

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
High Turnover (Sit Down Restaurant)	2,006,890.00	583.8264	0.0264	5.4600e-003	586.0739
Hotel	1,123,110.00	326.7262	0.0148	3.0600e-003	327.9840
Hotel	2,749,690.00	799.9158	0.0362	7.4800e-003	802.9952
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	3,580,550.00	1,041.6239	0.0471	9.7400e-003	1,045.6338
Regional Shopping Center	440,317.00	128.0932	5.7900e-003	1.2000e-003	128.5863
Total	9,900,557.00	2,880.1854	0.1302	0.0269	2,891.2732

Mitigated

		1,209,479.00			
	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
High Turnover (Sit Down Restaurant)	1,859,500.00	540.9487	0.0245	5.0600e-003	543.0312
Hotel	2,374,680.00	690.8209	0.0312	6.4600e-003	693.4803
Hotel	969,939.00	282.1663	0.0128	2.6400e-003	283.2525
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	3,105,110.00	903.3112	0.0409	8.4500e-003	906.7887
Regional Shopping Center	381,849.00	111.0843	5.0200e-003	1.0400e-003	111.5119
Total	8,691,078.00	2,528.3313	0.1143	0.0237	2,538.0646

6.0 Area Detail

6.1 Mitigation Measures Area

- Use Low VOC Paint - Residential Interior
- Use Low VOC Paint - Residential Exterior
- Use Low VOC Paint - Non-Residential Interior
- Use Low VOC Paint - Non-Residential Exterior
- No Hearths Installed
- Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.2720	4.8000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.0939	0.0939	2.7000e-004	0.0000	0.0996
Unmitigated	5.6289	4.8000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.0939	0.0939	2.7000e-004	0.0000	0.0996

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.8499					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.7741					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.9400e-003	4.8000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.0939	0.0939	2.7000e-004	0.0000	0.0996
Total	5.6289	4.8000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.0939	0.0939	2.7000e-004	0.0000	0.0996

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 133.684	136.1159	6.1500e-003	1.2700e-003	136.6400
High Turnover (Sit Down Restaurant)	18.124 / 1.15685	35.4572	0.5919	0.0142	52.2964
Hotel	17.7567 / 1.97297	35.5935	0.5800	0.0139	52.0948
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	8.93061 / 5.4736	22.4643	0.2919	7.0500e-003	30.7811
Regional Shopping Center	22.2425 / 13.6325	55.9494	0.7270	0.0176	76.6630
Total		285.5804	2.1969	0.0541	348.4752

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 106.947	108.8928	4.9200e-003	1.0200e-003	109.3120
High Turnover (Sit Down Restaurant)	14.4992 / 0.925481	26.4595	0.4735	0.0114	39.9235
Hotel	14.2054 / 1.57838	26.6072	0.4639	0.0111	39.8010
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	7.14449 / 4.37888	17.0321	0.2335	5.6400e-003	23.6819
Regional Shopping Center	17.794 / 10.906	42.4201	0.5815	0.0140	58.9820
Total		221.4117	1.7572	0.0432	271.7003

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	231.3529	13.6726	0.0000	518.4767
Unmitigated	462.7057	27.3451	0.0000	1,036.9533

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	9.65	1.9589	0.1158	0.0000	4.3899
High Turnover (Sit Down Restaurant)	710.55	144.2352	8.5241	0.0000	323.2404
Hotel	383.25	77.7963	4.5976	0.0000	174.3465
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	860.7	174.7143	10.3253	0.0000	391.5461

Regional Shopping Center	315.29	64.0010	3.7824	0.0000	143.4304
Total		462.7057	27.3451	0.0000	1,036.9533

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	4.825	0.9794	0.0579	0.0000	2.1950
High Turnover (Sit Down Restaurant)	355.275	72.1176	4.2620	0.0000	161.6202
Hotel	191.625	38.8981	2.2988	0.0000	87.1733
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	430.35	87.3572	5.1627	0.0000	195.7730
Regional Shopping Center	157.645	32.0005	1.8912	0.0000	71.7152
Total		231.3529	13.6726	0.0000	518.4767

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Total CO2	CH4	N2O	CO2e

Category	MT			
Unmitigated	-1,129,6400	0.0000	0.0000	1,129.640

10.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Cropland	182.2 / 0	-	0.0000	0.0000	-
		1,129,6400			1,129.6400
Total		-	0.0000	0.0000	-
		1,129.6400			1,129.6400

Manteca Family Entertainment Zone
San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	3,930.00	Space	10.50	0.00	0
City Park	87.20	Acre	55.50	139,937.00	0
City Park	12.70	Acre	12.70	20,745.00	0
City Park	12.30	Acre	12.30	35,719.00	0
High Turnover (Sit Down Restaurant)	59.71	1000sqft	4.60	59,711.00	0
Hotel	500.00	Room	28.90	365,650.00	0
Hotel	200.00	Room	0.00	149,350.00	0
Recreational Swimming Pool	75.00	1000sqft	0.00	75,000.00	0
Recreational Swimming Pool	76.00	1000sqft	0.00	76,000.00	0
Regional Shopping Center	267.40	1000sqft	27.20	267,405.00	0
Regional Shopping Center	32.88	1000sqft	2.20	32,884.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.7	Precipitation Freq (Days)	51
Climate Zone	2			Operational Year	2020

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MW/hr)	641.35	CH4 Intensity (lb/MW/hr)	0.029	N2O Intensity (lb/MW/hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and building square footage adjusted to actual. Existing BLD (28.5 acres) not included in modeling. Roads are 28.3 acres. Total
Construction Phase - Construction schedule estimate
Area Coating - Low VOC architectural coatings
Land Use Change -
Construction Off-road Equipment Mitigation -
Mobile Land Use Mitigation -
Area Mitigation - Low VOC architectural coatings
Energy Mitigation -
Water Mitigation -
Waste Mitigation -
Grading -

Table Name	Column Name	Default Value	New Value
tbiConstructionPhase	NumDays	220.00	80.00
tbiConstructionPhase	NumDays	3,100.00	880.00
tbiConstructionPhase	NumDays	310.00	45.00
tbiConstructionPhase	NumDays	220.00	80.00
tbiConstructionPhase	NumDays	120.00	20.00
tbiConstructionPhase	PhaseEndDate	3/31/2016	3/30/2016
tbiConstructionPhase	PhaseStartDate	1/29/2016	1/28/2016
tbiLandUse	LandUseSquareFeet	1,572,000.00	0.00
tbiLandUse	LandUseSquareFeet	535,788.00	35,719.00
tbiLandUse	LandUseSquareFeet	553,212.00	20,745.00
tbiLandUse	LandUseSquareFeet	3,798,432.00	139,937.00
tbiLandUse	LandUseSquareFeet	59,710.00	59,711.00
tbiLandUse	LandUseSquareFeet	290,400.00	149,350.00
tbiLandUse	LandUseSquareFeet	726,000.00	365,650.00
tbiLandUse	LandUseSquareFeet	267,400.00	267,405.00
tbiLandUse	LandUseSquareFeet	32,880.00	32,884.00
tbiLandUse	LotAcreage	35.37	10.50
tbiLandUse	LotAcreage	87.20	55.50

tbiLandUse	LotAcreage	1.37	4.60
tbiLandUse	LotAcreage	6.67	0.00
tbiLandUse	LotAcreage	16.67	28.90
tbiLandUse	LotAcreage	1.72	0.00
tbiLandUse	LotAcreage	1.74	0.00
tbiLandUse	LotAcreage	6.14	27.20
tbiLandUse	LotAcreage	0.75	2.20
tbiProjectCharacteristics	OperationalYear	2014	2020

2.0 Emissions Summary

2.1 Overall Construction Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.9330	7.2432	8.0815	0.0137	0.8880	0.3417	1.2296	0.3191	0.3181	0.6372	0.0000	1,174.8124	1,174.8124	0.1311	0.0000	1,177.5652
2017	0.8640	5.9963	7.9882	0.0157	0.6694	0.2738	0.9432	0.1815	0.2564	0.4379	0.0000	1,292.3371	1,292.3371	0.1019	0.0000	1,294.4768
2018	0.7671	5.3457	7.5288	0.0157	0.6719	0.2341	0.9060	0.1822	0.2193	0.4015	0.0000	1,266.6928	1,266.6928	0.0991	0.0000	1,268.7735
2019	2.5263	3.6170	5.0770	0.0108	0.4292	0.1602	0.5893	0.1163	0.1496	0.2659	0.0000	861.3200	861.3200	0.0858	0.0000	863.1211
2020	6.4946	0.0602	0.1395	3.7000e-004	0.0236	3.5400e-003	0.0271	6.2700e-003	3.5300e-003	9.8000e-003	0.0000	25.6632	25.6632	1.3800e-003	0.0000	25.6922
Total	11.5850	22.2624	28.8150	0.0562	2.6820	1.0133	3.6952	0.8055	0.9468	1.7523	0.0000	4,620.8254	4,620.8254	0.4192	0.0000	4,629.6287

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.9330	7.2432	8.0815	0.0137	0.6587	0.3417	1.0004	0.2092	0.3181	0.5272	0.0000	1,174.8119	1,174.8119	0.1311	0.0000	1,177.5647
2017	0.8640	5.9963	7.9882	0.0157	0.6694	0.2738	0.9432	0.1815	0.2564	0.4379	0.0000	1,292.3368	1,292.3368	0.1019	0.0000	1,294.4764
2018	0.7671	5.3457	7.5288	0.0157	0.6719	0.2341	0.9060	0.1822	0.2193	0.4015	0.0000	1,266.6924	1,266.6924	0.0991	0.0000	1,268.7731
2019	2.5263	3.6170	5.0770	0.0108	0.4292	0.1602	0.5893	0.1163	0.1496	0.2659	0.0000	861.3197	861.3197	0.0858	0.0000	863.1207
2020	6.4946	0.0602	0.1395	3.7000e-004	0.0236	3.5400e-003	0.0271	6.2700e-003	3.5300e-003	9.8000e-003	0.0000	25.6632	25.6632	1.3800e-003	0.0000	25.6922
Total	11.5850	22.2624	28.8150	0.0562	2.4527	1.0133	3.4660	0.6955	0.9468	1.6423	0.0000	4,620.8239	4,620.8239	0.4192	0.0000	4,629.6271

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	8.55	0.00	6.20	13.65	0.00	6.27	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.6285	4.5000e-004	0.0486	0.0000		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	0.0939	0.0939	2.5000e-004	0.0000	0.0992
Energy	0.1339	1.2170	1.0223	7.3000e-003		0.0925	0.0925		0.0925	0.0925	0.0000	4,205.0682	4,205.0682	0.1556	0.0512	4,224.2191
Mobile	15.7454	36.2989	153.5831	0.3111	18.8549	0.5399	19.3948	5.0575	0.4976	5.5551	0.0000	22,230.8187	22,230.8187	0.7229	0.0000	22,245.9993
Waste						0.0000	0.0000		0.0000	0.0000	462.7057	0.0000	462.7057	27.3451	0.0000	1,036.9533
Water						0.0000	0.0000		0.0000	0.0000	21.2731	264.3073	285.5804	2.1969	0.0541	348.4752

Total	21.5078	37.5164	154.6540	0.3184	18.8549	0.6326	19.4875	5.0575	0.5902	5.6478	483.9788	26,700.28	27,184.266	30.4208	0.1053	27,855.74
												81	9			61

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.2716	4.5000e-004	0.0486	0.0000		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	0.0939	0.0939	2.5000e-004	0.0000	0.0992
Energy	0.1173	1.0665	0.8958	6.4000e-003		0.0811	0.0811		0.0811	0.0811	0.0000	3,689.316	3,689.3169	0.1366	0.0449	3,706.1158
Mobile	15.0575	31.2414	140.5182	0.2538	15.1723	0.4454	15.6177	4.0697	0.4105	4.4802	0.0000	18,127.82	18,127.827	0.6069	0.0000	18,140.5722
Waste						0.0000	0.0000		0.0000	0.0000	231.3529	0.0000	231.3529	13.6726	0.0000	518.4767
Water						0.0000	0.0000		0.0000	0.0000	17.0185	204.3932	221.4116	1.7572	0.0432	271.7003
Total	20.4464	32.3083	141.4627	0.2602	15.1723	0.5266	15.6989	4.0697	0.4917	4.5614	248.3713	22,021.63	22,270.003	16.1735	0.0881	22,636.9641

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	4.93	13.88	8.53	18.28	19.53	16.76	19.44	19.53	16.70	19.24	48.68	17.52	18.08	46.83	16.30	18.74

2.3 Vegetation
Vegetation

	CO2e
Category	MT

Vegetation Land Change	-
Total	1,129,6400

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2016	1/28/2016	5	20	
2	Grading	Grading	1/28/2016	3/30/2016	5	45	
3	Building Construction	Building Construction	3/31/2016	8/14/2019	5	880	
4	Paving	Paving	8/15/2019	12/4/2019	5	80	
5	Architectural Coating	Architectural Coating	12/5/2019	3/25/2020	5	80	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,833,602; Non-Residential Outdoor: 611,201 (Architectural

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29

Off-Road	0.0508	0.5463	0.4111	3.9000e-004	0.0294	0.0294	0.0270	0.0000	36.8771	36.8771	0.0111	0.0000	37.1107		
Total	0.0508	0.5463	0.4111	3.9000e-004	0.0294	0.1807	0.2101	0.0993	0.0270	0.1264	36.8771	36.8771	0.0111	0.0000	37.1107

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759
Total	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0705	0.0000	0.0705	0.0387	0.0000	0.0387	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5463	0.4111	3.9000e-004		0.0294	0.0294		0.0270	0.0270	0.0000	36.8771	36.8771	0.0111	0.0000	37.1107
Total	0.0508	0.5463	0.4111	3.9000e-004	0.0705	0.0294	0.0999	0.0387	0.0270	0.0658	0.0000	36.8771	36.8771	0.0111	0.0000	37.1107

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759
Total	6.5000e-004	8.2000e-004	7.8900e-003	2.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2745	1.2745	7.0000e-005	0.0000	1.2759

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1952	0.0000	0.1952	0.0809	0.0000	0.0809	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1458	1.6833	1.1056	1.3900e-003		0.0807	0.0807		0.0742	0.0742	0.0000	130.9404	130.9404	0.0395	0.0000	131.7698
Total	0.1458	1.6833	1.1056	1.3900e-003	0.1952	0.0807	0.2758	0.0809	0.0742	0.1551	0.0000	130.9404	130.9404	0.0395	0.0000	131.7698

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Worker	1.6200e-003	2.0500e-003	0.0197	4.0000e-005	3.5800e-003	3.0000e-005	3.6100e-003	9.5000e-004	2.0000e-005	9.8000e-004	0.0000	3.1863	3.1863	1.6000e-004	0.0000	3.1897
Total	1.6200e-003	2.0500e-003	0.0197	4.0000e-005	3.5800e-003	3.0000e-005	3.6100e-003	9.5000e-004	2.0000e-005	9.8000e-004	0.0000	3.1863	3.1863	1.6000e-004	0.0000	3.1897

3.4 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3355	2.8079	1.8229	2.6400e-003			0.1938		0.1821	0.1821	0.0000	238.5213	238.5213	0.0592	0.0000	239.7636
Total	0.3355	2.8079	1.8229	2.6400e-003			0.1938		0.1821	0.1821	0.0000	238.5213	238.5213	0.0592	0.0000	239.7636

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2274	1.9866	2.6303	4.7000e-003	0.1282	0.0350	0.1631	0.0368	0.0321	0.0689	0.0000	427.1470	427.1470	3.7700e-003	0.0000	427.2262
Worker	0.1713	0.2162	2.0841	4.5400e-003	0.3790	2.8500e-003	0.3818	0.1008	2.6100e-003	0.1034	0.0000	336.8658	336.8658	0.0173	0.0000	337.2293
Total	0.3987	2.2028	4.7144	9.2400e-003	0.5071	0.0378	0.5449	0.1375	0.0347	0.1723	0.0000	764.0128	764.0128	0.0211	0.0000	764.4555

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3355	2.8079	1.8229	2.6400e-003		0.1938	0.1938		0.1821	0.1821	0.0000	238.5210	238.5210	0.0592	0.0000	239.7633
Total	0.3355	2.8079	1.8229	2.6400e-003		0.1938	0.1938		0.1821	0.1821	0.0000	238.5210	238.5210	0.0592	0.0000	239.7633

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2274	1.9866	2.6303	4.7000e-003	0.1282	0.0350	0.1631	0.0368	0.0321	0.0689	0.0000	427.1470	427.1470	3.7700e-003	0.0000	427.2262
Worker	0.1713	0.2162	2.0841	4.5400e-003	0.3790	2.8500e-003	0.3818	0.1008	2.6100e-003	0.1034	0.0000	336.8658	336.8658	0.0173	0.0000	337.2293
Total	0.3987	2.2028	4.7144	9.2400e-003	0.5071	0.0378	0.5449	0.1375	0.0347	0.1723	0.0000	764.0128	764.0128	0.0211	0.0000	764.4555

3.4 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	0.4033	3.4327	2.3568	3.4900e-003	0.2316	0.2316	0.2175	0.0000	311.3228	311.3228	0.0766	0.0000	312.9319
Total	0.4033	3.4327	2.3568	3.4900e-003	0.2316	0.2316	0.2175	0.0000	311.3228	311.3228	0.0766	0.0000	312.9319

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2630	2.3115	3.2282	6.1900e-003	0.1692	0.0367	0.2079	0.0486	0.0356	0.0841	0.0000	594.1348	594.1348	4.6100e-003	0.0000	554.2316
Worker	0.1976	0.2521	2.4033	3.9800e-003	0.5002	3.6000e-003	0.5037	0.1330	3.3100e-003	0.1363	0.0000	426.8795	426.8795	0.0207	0.0000	427.3133
Total	0.4606	2.5636	5.6315	0.0122	0.6694	0.0423	0.7116	0.1815	0.0389	0.2204	0.0000	981.0143	981.0143	0.0253	0.0000	981.5449

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3225	311.3225	0.0766	0.0000	312.9315
Total	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3225	311.3225	0.0766	0.0000	312.9315

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2630	2.3115	3.2282	6.1900e-003	0.1692	0.0387	0.2079	0.0486	0.0356	0.0841	0.0000	554.1348	554.1348	4.6100e-003	0.0000	554.2316
Worker	0.1976	0.2521	2.4033	5.9800e-003	0.5002	3.6000e-003	0.5037	0.1330	3.3100e-003	0.1363	0.0000	426.8795	426.8795	0.0207	0.0000	427.3133
Total	0.4606	2.5636	5.6315	0.0122	0.6694	0.0423	0.7116	0.1815	0.0389	0.2204	0.0000	981.0143	981.0143	0.0253	0.0000	981.5449

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723
Total	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2433	2.0841	3.1002	6.2000e-003	0.1698	0.0356	0.2054	0.0487	0.0327	0.0814	0.0000	546.6031	546.6031	4.4900e-003	546.6974
Worker	0.1755	0.2260	2.1406	5.9800e-003	0.5021	3.5100e-003	0.5056	0.1335	3.2400e-003	0.1367	0.0000	411.1053	411.1053	0.0190	411.5037
Total	0.4189	2.3101	5.2408	0.0122	0.6719	0.0391	0.7110	0.1822	0.0359	0.2182	0.0000	957.7084	957.7084	0.0235	958.2011

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720
Total	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2433	2.0841	3.1002	6.2000e-003	0.1698	0.0356	0.2054	0.0487	0.0327	0.0814	0.0000	546.6031	546.6031	4.4900e-003	0.0000	546.6974

Worker	0.1755	0.2260	2.1406	5.9800e-003	0.5021	3.5100e-003	0.5056	0.1335	3.2400e-003	0.1367	0.0000	411.1053	411.1053	0.0190	0.0000	411.5037
Total	0.4189	2.3101	5.2408	0.0122	0.6719	0.0391	0.7110	0.1822	0.0359	0.2182	0.0000	957.7084	957.7084	0.0235	0.0000	958.2011

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1905	1.6982	1.3868	2.1700e-003		0.1041	0.1041		0.0979	0.0979	0.0000	189.6394	189.6394	0.0461	0.0000	190.6084
Total	0.1905	1.6982	1.3868	2.1700e-003		0.1041	0.1041		0.0979	0.0979	0.0000	189.6394	189.6394	0.0461	0.0000	190.6084

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1412	1.1717	1.8494	3.8400e-003	0.1054	0.0203	0.1257	0.0303	0.0186	0.0489	0.0000	333.4401	333.4401	2.6900e-003	0.0000	333.4966
Worker	0.0990	0.1274	1.2019	3.7100e-003	0.3116	2.1400e-003	0.3138	0.0829	1.9900e-003	0.0848	0.0000	246.0866	246.0866	0.0109	0.0000	246.3164
Total	0.2402	1.2991	3.0514	7.5500e-003	0.4171	0.0224	0.4395	0.1131	0.0206	0.1337	0.0000	579.5267	579.5267	0.0136	0.0000	579.8131

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1905	1.6982	1.3868	2.1700e-003		0.1041	0.1041		0.0979	0.0979	0.0000	189.6392	189.6392	0.0461	0.0000	190.6082
Total	0.1905	1.6982	1.3868	2.1700e-003		0.1041	0.1041		0.0979	0.0979	0.0000	189.6392	189.6392	0.0461	0.0000	190.6082

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1412	1.1717	1.8494	3.8400e-003	0.1054	0.0203	0.1257	0.0303	0.0186	0.0489	0.0000	333.4401	333.4401	2.6900e-003	0.0000	333.4966
Worker	0.0990	0.1274	1.2019	3.7100e-003	0.3116	2.1400e-003	0.3138	0.0829	1.9900e-003	0.0848	0.0000	246.0866	246.0866	0.0109	0.0000	246.3164
Total	0.2402	1.2991	3.0514	7.5500e-003	0.4171	0.0224	0.4395	0.1131	0.0206	0.1337	0.0000	579.5267	579.5267	0.0136	0.0000	579.8131

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	0.0570	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0298	0.0298	0.0000	80.1579	80.1579	0.0254	0.0000	80.6905
Paving	0.0138				0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0708	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0298	0.0298	0.0000	80.1579	80.1579	0.0254	0.0000	80.6905

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776
Total	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0570	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0324	0.0298	0.0298	0.0298	0.0000	80.1578	80.1578	0.0254	0.0000	80.6904
Paving	0.0138				0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0708	0.5974	0.5746	8.9000e-004	0.0324	0.0324	0.0324	0.0298	0.0298	0.0298	0.0000	80.1578	80.1578	0.0254	0.0000	80.6904

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776
Total	1.5200e-003	1.9500e-003	0.0184	6.0000e-005	4.7800e-003	3.0000e-005	4.8100e-003	1.2700e-003	3.0000e-005	1.3000e-003	0.0000	3.7740	3.7740	1.7000e-004	0.0000	3.7776

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.0185					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5300e-003	0.0174	0.0175	3.0000e-005		1.2200e-003	1.2200e-003		1.2200e-003	1.2200e-003	0.0000	2.4256	2.4256	2.0000e-004	0.0000	2.4299
Total	2.0210	0.0174	0.0175	3.0000e-005		1.2200e-003	1.2200e-003		1.2200e-003	1.2200e-003	0.0000	2.4256	2.4256	2.0000e-004	0.0000	2.4299

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Worker	2.3300e-003	3.0000e-003	0.0283	9.0000e-005	7.3400e-003	5.0000e-005	7.3500e-003	1.9500e-003	5.0000e-005	2.0000e-003	0.0000	5.7963	5.7963	2.6000e-004	0.0000	5.8017
Total	2.3300e-003	3.0000e-003	0.0283	9.0000e-005	7.3400e-003	5.0000e-005	7.3500e-003	1.9500e-003	5.0000e-005	2.0000e-003	0.0000	5.7963	5.7963	2.6000e-004	0.0000	5.8017

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Archit. Coating	6.4803					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.3900e-003	0.0514	0.0559	9.0000e-005		3.3800e-003	3.3800e-003		3.3800e-003	3.3800e-003	0.0000	7.7874	7.7874	6.0000e-004	0.0000	7.8001
Total	6.4877	0.0514	0.0559	9.0000e-005		3.3800e-003	3.3800e-003		3.3800e-003	3.3800e-003	0.0000	7.7874	7.7874	6.0000e-004	0.0000	7.8001

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9400e-003	8.8600e-003	0.0836	2.8000e-004	0.0236	1.6000e-004	0.0237	6.2700e-003	1.5000e-004	6.4100e-003	0.0000	17.8758	17.8758	7.8000e-004	0.0000	17.8921
Total	6.9400e-003	8.8600e-003	0.0836	2.8000e-004	0.0236	1.6000e-004	0.0237	6.2700e-003	1.5000e-004	6.4100e-003	0.0000	17.8758	17.8758	7.8000e-004	0.0000	17.8921

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	MT/yr															
Archit. Coating	6.4803					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.3900e-003	0.0514	0.0559	9.0000e-005		3.3800e-003	3.3800e-003		3.3800e-003	3.3800e-003	0.0000	7.7874	7.7874	6.0000e-004	0.0000	7.8001
Total	6.4877	0.0514	0.0559	9.0000e-005		3.3800e-003	3.3800e-003		3.3800e-003	3.3800e-003	0.0000	7.7874	7.7874	6.0000e-004	0.0000	7.8001

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9400e-003	8.8600e-003	0.0836	2.8000e-004	0.0236	1.6000e-004	0.0237	6.2700e-003	1.5000e-004	6.4100e-003	0.0000	17.8758	17.8758	7.8000e-004	0.0000	17.8921
Total	6.9400e-003	8.8600e-003	0.0836	2.8000e-004	0.0236	1.6000e-004	0.0237	6.2700e-003	1.5000e-004	6.4100e-003	0.0000	17.8758	17.8758	7.8000e-004	0.0000	17.8921

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

- Increase Transit Accessibility
- Improve Pedestrian Network
- Provide Traffic Calming Measures

Limit Parking Supply

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	15,0575	31,2414	140,5182	0,2538	15,1723	0,4454	15,6177	4,0697	0,4105	4,4802	0,0000	18,127,827	18,127,827	0,6069	0,0000	18,140,5722
Unmitigated	15,7454	36,2989	153,5831	0,3111	18,8549	0,5399	19,3948	5,0575	0,4976	5,5551	0,0000	22,230,818	22,230,818	0,7229	0,0000	22,245,9993

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate				Unmitigated		Mitigated	
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT	Annual VMT	Annual VMT	Annual VMT
City Park	138.65	138.65	138.65	295,993	295,993	238,182		
City Park	20.19	20.19	20.19	43,109	43,109	34,689		
City Park	19.56	19.56	19.56	41,751	41,751	33,597		
High Turnover (Sit Down Restaurant)	7,592.13	9,456.27	7,872.17	9,164,279	9,164,279	7,374,383		
Hotel	4,085.00	4,095.00	2,975.00	7,462,657	7,462,657	6,005,109		
Hotel	1,634.00	1,638.00	1,190.00	2,985,063	2,985,063	2,402,043		
Parking Lot	0.00	0.00	0.00					
Recreational Swimming Pool	2,469.75	1,565.25	2,004.75	4,109,948	4,109,948	3,307,225		
Recreational Swimming Pool	2,502.68	1,586.12	2,031.48	4,164,748	4,164,748	3,351,322		
Regional Shopping Center	11,482.16	13,361.98	6,749.18	19,417,083	19,417,083	15,624,690		
Regional Shopping Center	1,411.87	1,643.01	829.89	2,387,561	2,387,561	1,921,241		
Total	31,355.98	33,524.03	23,830.86	50,072,191	50,072,191	40,292,481		

4.3 Trip Type Information

Land Use	Miles				Trip %				Trip Purpose %			
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-C	H-S or C-C	H-O or C-NW	H-W or C-C	H-S or C-C	Primary	Diversified	Pass-by	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	66	28	6	6
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	66	28	6	6
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	66	28	6	6
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	37	20	43	43

Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.460854	0.064551	0.160165	0.167298	0.044807	0.005924	0.018673	0.065810	0.001113	0.001471	0.006396	0.000618	0.002319

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Natural Gas Mitigated	0.1173	1.0665	0.8958	6.4000e-003		0.0811	0.0811		0.0811	0.0811	0.0000	1,160.9856	1,160.9856	0.0223	0.0213	1,168.0512
Natural Gas Unmitigated	0.1339	1.2170	1.0223	7.3000e-003		0.0925	0.0925		0.0925	0.0925	0.0000	1,324.8821	1,324.8828	0.0254	0.0243	1,332.9459
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,528.3313	2,528.3313	0.1143	0.0237	2,538.0646
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,880.1854	2,880.1854	0.1302	0.0269	2,891.2732

5.2 Energy by Land Use - Natural Gas

Unmitigated

	Natural Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
High Turnover (Sit Down Restaurant)	6.66016e+006	0.0359	0.3265	0.2742	1.9600e-003		0.0248	0.0248		0.0248	0.0248	0.0000	355.4118	355.4118	6.8100e-003	6.5200e-003	357.5747
Hotel	1.02784e+007	0.0554	0.5038	0.4232	3.0200e-003		0.0383	0.0383		0.0383	0.0383	0.0000	548.4957	548.4957	0.0105	0.0101	551.8338
Hotel	4.19823e+006	0.0226	0.2058	0.1729	1.2300e-003		0.0156	0.0156		0.0156	0.0156	0.0000	224.0335	224.0335	4.2900e-003	4.1100e-003	225.3969
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	3.28641e+006	0.0177	0.1611	0.1353	9.7000e-004		0.0122	0.0122		0.0122	0.0122	0.0000	175.3752	175.3752	3.3600e-003	3.2200e-003	176.4425
Regional Shopping Center	404144	2.1800e-003	0.0198	0.0166	1.2000e-004		1.5100e-003	1.5100e-003		1.5100e-003	1.5100e-003	0.0000	21.5667	21.5667	4.1000e-004	4.0000e-004	21.6979
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.1339	1.2170	1.0223	7.3000e-003		0.0925	0.0925		0.0925	0.0925	0.0000	1,324.8828	1,324.8828	0.0254	0.0243	1,332.9459

Mitigated

	Natural Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr											MT/yr				
High Turnover (Sit Down Restaurant)	6.27763e+006	0.0339	0.3077	0.2585	1.8500e-003		0.0234	0.0234		0.0234	0.0234	0.0000	334.9981	334.9981	6.4200e-003	6.1400e-003	337.0368
Hotel	3.57432e+006	0.0193	0.1752	0.1472	1.0500e-003		0.0133	0.0133		0.0133	0.0133	0.0000	190.7393	190.7393	3.6600e-003	3.5000e-003	191.9001

Hotel	8.75092e+006	0.0472	0.4290	0.3603	2.5700e-003	0.0326	0.0326	0.0326	0.0000	466.9823	466.9823	8.9500e-003	8.5600e-003	469.8243
Parking Lot	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	2.80789e+006	0.0151	0.1376	0.1156	8.3000e-004	0.0105	0.0105	0.0105	0.0000	149.8395	149.8395	2.8700e-003	2.7500e-003	150.7514
Regional Shopping Center	345298	1.8600e-003	0.0169	0.0142	1.0000e-004	1.2900e-003	1.2900e-003	1.2900e-003	0.0000	18.4264	18.4264	3.5000e-004	3.4000e-004	18.5386
City Park	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.1173	1.0665	0.8958	6.4000e-003	0.0811	0.0811	0.0811	0.0000	1,160.9856	1,160.9856	0.0223	0.0213	1,168.0512

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
High Turnover (Sit Down Restaurant)	2.00689e+006	583.8264	0.0264	5.4600e-003	586.0739
Hotel	1.12311e+006	326.7262	0.0148	3.0600e-003	327.9840
Hotel	2.74969e+006	799.9158	0.0362	7.4800e-003	802.9952
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	3.58055e+006	1,041.6239	0.0471	9.7400e-003	1,045.6338
Regional Shopping Center	440317	128.0932	5.7900e-003	1.2000e-003	128.5863
Total		2,880.1854	0.1302	0.0269	2,891.2732

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
High Turnover (Sit Down Restaurant)	1.8595e+06	540.9487	0.0245	5.0600e-003	543.0312
Hotel	2.37468e+006	690.8209	0.0312	6.4600e-003	693.4803
Hotel	969939	282.1663	0.0128	2.6400e-003	283.2525
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	3.10511e+006	903.3112	0.0409	8.4500e-003	906.7887
Regional Shopping Center	381849	111.0843	5.0200e-003	1.0400e-003	111.5119
Total		2,528.3313	0.1143	0.0237	2,538.0646

6.0 Area Detail

6.1 Mitigation Measures Area

- Use Low VOC Paint - Residential Interior
- Use Low VOC Paint - Residential Exterior
- Use Low VOC Paint - Non-Residential Interior
- Use Low VOC Paint - Non-Residential Exterior
- No Hearths Installed
- Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.2716	4.5000e-004	0.0486	0.0000	1.7000e-004	1.7000e-004	1.7000e-004	1.7000e-004	1.7000e-004	1.7000e-004	0.0000	0.0939	0.0939	2.5000e-004	0.0000	0.0992
Unmitigated	5.6285	4.5000e-004	0.0486	0.0000	1.7000e-004	1.7000e-004	1.7000e-004	1.7000e-004	1.7000e-004	1.7000e-004	0.0000	0.0939	0.0939	2.5000e-004	0.0000	0.0992

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.8499					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.7741					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.5700e-003	4.5000e-004	0.0486	0.0000	1.7000e-004	1.7000e-004	1.7000e-004	1.7000e-004	1.7000e-004	1.7000e-004	0.0000	0.0939	0.0939	2.5000e-004	0.0000	0.0992
Total	5.6285	4.5000e-004	0.0486	0.0000		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	0.0939	0.0939	2.5000e-004	0.0000	0.0992

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 133.684	136.1159	6.1500e-003	1.2700e-003	136.6400
High Turnover (Sit Down Restaurant)	18.124 / 1.15685	35.4572	0.5919	0.0142	52.2964
Hotel	17.7567 / 1.97297	35.5935	0.5800	0.0139	52.0948
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	8.93061 / 5.4736	22.4643	0.2919	7.0500e-003	30.7811
Regional Shopping Center	22.2425 / 13.6325	55.9494	0.7270	0.0176	76.6630
Total		285.5804	2.1969	0.0541	348.4752

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 106.947	108.8928	4.9200e-003	1.0200e-003	109.3120
High Turnover (Sit Down Restaurant)	14.4992 / 0.925481	26.4595	0.4735	0.0114	39.9235
Hotel	14.2054 / 1.57838	26.6072	0.4639	0.0111	39.8010
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	7.14449 / 4.37888	17.0321	0.2335	5.6400e-003	23.6819
Regional Shopping Center	17.794 / 10.906	42.4201	0.5815	0.0140	58.9820
Total		221.4117	1.7572	0.0432	271.7003

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	231.3529	13.6726	0.0000	518.4767
Unmitigated	462.7057	27.3451	0.0000	1,036.9533

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	9.65	1.9589	0.1158	0.0000	4.3899
High Turnover (Sit Down Restaurant)	710.55	144.2352	8.5241	0.0000	323.2404
Hotel	383.25	77.7963	4.5976	0.0000	174.3465
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	860.7	174.7143	10.3253	0.0000	391.5461

Regional Shopping Center	315.29	64.0010	3.7824	0.0000	143.4304
Total		462.7057	27.3451	0.0000	1,036.9533
					3

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	4.825	0.9794	0.0579	0.0000	2.1950
High Turnover (Sit Down Restaurant)	355.275	72.1176	4.2620	0.0000	161.6202
Hotel	191.625	38.8981	2.2988	0.0000	87.1733
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	430.35	87.3572	5.1627	0.0000	195.7730
Regional Shopping Center	157.645	32.0005	1.8912	0.0000	71.7152
Total		231.3529	13.6726	0.0000	518.4767

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

	Total CO2	CH4	N2O	CO2e

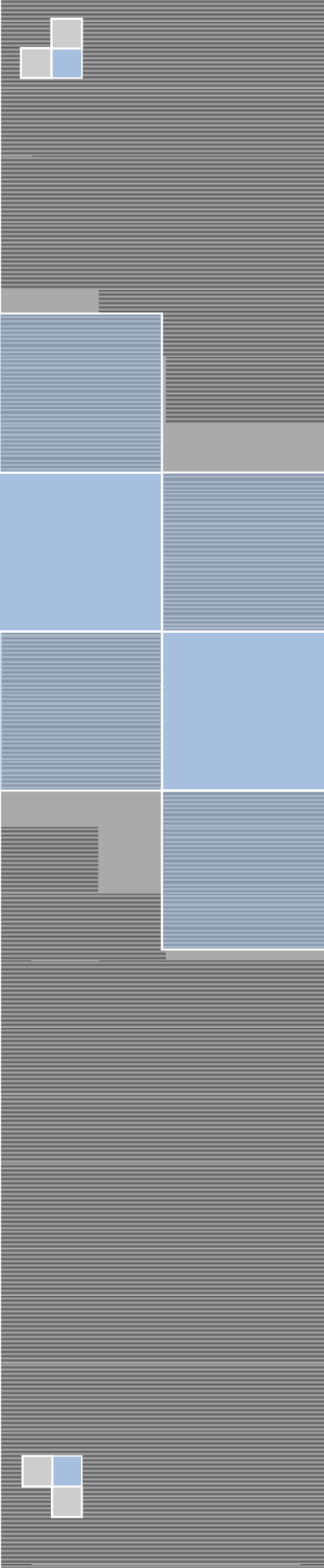
Category	MT		
Unmitigated	-	0.0000	0.0000
	1,129,6400		1,129,640

10.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Cropland	182.2 / 0	-	0.0000	0.0000	-
		1,129,6400			1,129,640
Total		-	0.0000	0.0000	-
		1,129,6400			1,129,640
					0

WETLAND DELINEATION



PRELIMINARY WETLAND DELINEATION

FRENCH CAMP OUTLET CANAL IMPROVEMENTS AND MANTECA FAMILY ENTERTAINMENT PROJECT

MANTECA, SAN JOAQUIN COUNTY, CA.

FEBRUARY 2015

Prepared for:

City of Manteca
1001 West Center Street
Manteca, CA 95337
(209) 456-8511

Prepared by:

De Novo Planning Group
1020 Suncast Lane, Suite 106
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(916) 580-9818

D e N o v o P l a n n i n g G r o u p

A Land Use Planning, Design, and Environmental Firm



PRELIMINARY WETLAND DELINEATION
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MANTECA FAMILY ENTERTAINMENT PROJECT
MANTECA, SAN JOAQUIN COUNTY, CA.

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METHODOLOGY

APPROACH

The Delineation of Jurisdictional Waters and Wetlands that is reported in this document was conducted in accordance with regulations set forth in 33 Code of Federal Regulations (CFR) Part 328 and the USACE guidance documents referenced below:

- USACE Wetlands Research Program Technical Report Y-87-1, Wetlands Delineation Manual, Environmental Laboratory, 1987 (Wetland Manual).
- USFWS Classification of Wetlands and Deepwater Habitats of the United States, Lexis M. Cowardin, U.S. Department of Interior, Fish and Wildlife Service, FWS/OBS-79/31, December 1979, updated 1992 (Cowardin).
- USACE Jurisdictional Determination Form Instruction Guidebook, 2007.
- USACE Minimum Standards for Acceptance of Preliminary Wetlands Delineations, November 30, 2001 (Minimum Standards).
- USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)
- USACE Jurisdictional Determination Form Instructional Guidebook, May 30, 2007 (JD Form Guidebook).
- USACE Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, July 2010.
- Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States* and *Carabell v. United States* (June 5, 2007) (Rapanos Guidance).
- USACE A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the United States, August 2008 (OHWM Manual).
- USACE Regulatory Guidance Letter No. 07-02; Exemptions for Construction or Maintenance of Irrigation Ditches and Maintenance of Drainage Ditches Under Section 404 of the Clean Water Act, July 4, 2007 (Irrigation Ditch Guidance)

PRE-FIELD INVESTIGATION

Prior to the field investigation several maps were reviewed to identify drainage features within the Project site, as indicated from topographic changes or visible drainage patterns. The maps include the Lathrop and Manteca, California, U.S. Geological Survey (USGS) 7.5-minute Quadrangle, USGS National Hydrography Data Set, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, National Resource Conservation Service (NRCS) Soil Survey, and aerial photos. Additionally, the NRCS Soil Survey was reviewed to identify all soil series that occur within the Project site.

FIELD INVESTIGATION

2011 Field Surveys

The field investigations were performed within the Project site by Steve McMurtry on March 28, March 29, and April 14, 2011. Tools used included a Trimble GeoExplorer XH Handheld (sub-foot unit), 30-meter tape measure, diameter tape, spade, Dutch auger, Munsell color chart, alpha-alpha dipridil solution, muriatic acid, wetland flagging, and digital camera. All features were mapped using the sub-foot Trimble GPS unit plotted onto an orthographically corrected aerial photograph using ArcGIS. Additionally, an ACAD file with a recent topo survey was plotted on the aerial photos.

All surveys were conducted on foot. Potential jurisdictional features were systematically inspected to record existing conditions and to determine the jurisdictional limits. The Project site was assessed carefully for surface flow indicators (presence of hydrophytic vegetation, staining, cracked soil, ponding, etc.). The apparent flow regimes and corresponding hydrogeomorphic features were subsequently identified. In non-wetland jurisdictional areas, the lateral extent of USACE jurisdiction was measured at the OHWM. Where appropriate, multiple measurements were recorded at various representative locations along the length of the feature.

Potential wetland areas were assessed to the outer reach of the applicable (hydrophytic) vegetative community or (where vegetation was absent/disturbed) to the natural topographical rim of the depressional feature (whichever was greater). Features previously indicated on aerial photographs (dark/saturated areas, associated riparian vegetation, etc.) were field verified during the site visit. Plant species for each vegetative community were identified and given an indicator status as prescribed in the “National List of Plant Species That Occur in Wetlands: 1988 National Summary” (Reed 1988). All data collected were recorded on wetland data forms and evaluated using the 2006 USACE Arid West Regional Guidance (see Appendix for wetland data forms).

Width and length measurements were recorded using a subfoot Trimble GPS unit. The GPS data was downloaded into ArcGIS software to precisely identify the location and dimensions of jurisdictional areas. The ArcGIS application was then used to compute federal and state jurisdiction in acres. The acreage computations were plotted against the ortho photo.

2014 Field Surveys

Subsequent field investigations were performed within the Project site by Steve McMurtry on March 28, 2014 to extend on the delineation of Other Waters (the French Camp Canal) from the portion that was surveyed in the 2011 field surveys north to the Manteca Family Entertainment Zone project boundary. Tools used included a Trimble GeoExplorer XH Handheld (sub-foot unit), 30-meter tape measure, diameter tape, spade, Dutch auger, Munsell color chart, alpha-alpha dipridil solution, muriatic acid, wetland flagging, and digital camera. All features were mapped using the sub-foot Trimble GPS unit plotted onto an orthographically corrected aerial photograph using ArcGIS. Additionally, an ACAD file with a recent topo survey was plotted on the aerial photos.

All surveys were conducted on foot. Potential jurisdictional features were systematically inspected to record existing conditions and to determine the jurisdictional limits. The Project site was

assessed carefully for surface flow indicators (presence of hydrophytic vegetation, staining, cracked soil, ponding, etc.). The apparent flow regimes and corresponding hydrogeomorphic features were subsequently identified. In non-wetland jurisdictional areas, the lateral extent of USACE jurisdiction was measured at the OHWM. Where appropriate, multiple measurements were recorded at various representative locations along the length of the feature.

The 2014 surveys did not include investigation of potential wetland areas, other than a re-inspection of the wetlands that were surveyed in 2011. All data collected were recorded on wetland data forms and evaluated using the 2006 USACE Arid West Regional Guidance (see Appendix for wetland data forms). There is a wetland feature that is located partially inside, and partially outside of the project boundary at the northern most portion of the Manteca Family Entertainment Zone project. The City has decided to exclude this wetland feature from the proposed Manteca Family Entertainment Zone project due to the presence of the wetland. As such, this wetland feature has been excluded from this delineation.

Width and length measurements were recorded using a subfoot Trimble GPS unit. The GPS data was downloaded into ArcGIS software to precisely identify the location and dimensions of jurisdictional areas. The ArcGIS application was then used to compute federal and state jurisdiction in acres. The acreage computations were plotted against the ortho photo.

REGIONAL SETTING

PROJECT LOCATION

The Project site is located in the City of Manteca, San Joaquin County, California (Figure 2-1 Regional Location Map). The Project site is located on the Lathrop, California, USGS 7.5-minute quadrangle, Township 2 South, Range 6 East (Figure 2-1 and 2-2). The UTM coordinates for the center point of the Project site are 652688.47536 W, 4183417.94368 N (zone 10N, NAD 83, meters). The Lat/Long coordinates are 37.7853 N, -121.2660 W (WGS 84, decimal degrees).

The Project site is located to the north and west of the Stadium Shopping Center, to the west of Milo Candini Drive, to the east of McKinley Avenue, to the south of the City of Manteca Wastewater Quality Control Facility (WQCF), and to the north of State Route 120. The Project site is comprised of approximately 210.7 acres to be developed with various public serving regional and local recreation, parks, and sporting facilities including visitor serving commercial uses and public infrastructure to be developed in phases. The Project site includes the existing Big League Dreams Sports Park. The proposed Project serves as an expansion of the existing Sports Park.

Directions to the Project Site

From SR-120 west, exit at the South Airport Way off ramp and travel north. Turn left on Daniels Street and travel for approximately 0.5 miles to the northeastern corner of the Project site.

ENVIRONMENTAL CONDITIONS

Topography

The Project site has been leveled for agricultural uses. Topographic features within the Project site include level agricultural fields and farm roads, an irrigation canal, and wetland areas, in addition to the existing developed Big League Dreams Sports Park. Elevation ranges from approximately 20 feet to 25 feet above mean sea level (MSL).

Climate

The City of Manteca is located in the northern portion of the San Joaquin Valley, which has a Mediterranean climate that is subject to cool, wet winters (often blanketed with fog) and hot, dry summers. The average annual precipitation is approximately 13.81 inches. Precipitation occurs as rain most of which falls between the months of November through April, peaking in January at 2.85 inches. The average temperatures range from December lows of 37.5 F to July highs of 94.3 F.

Field Conditions at time of the 2011 Field Investigation

The Central Valley of California was experiencing average meteorological conditions from April through November 2010 and was above average (moderately moist to extremely moist) through the winter and spring months preceding the delineation (March/April 2011). Table 1 provides meteorological information for the 2010-2011 calendar years.

TABLE 1: LONG-TERM METEOROLOGICAL CONDITIONS 2010-2011

DATE	PALMER SEVERITY INDEX
April to November-2010	Midrange
December-2010	Very Moist
January-2011	Moderately Moist
March-2011	Very Moist
April-2011	Extremely Moist

SOURCE: NOAA PALMER DROUGHT SEVERITY INDEX LONG-TERM HYDROLOGICAL CONDITIONS, (2011)

Field Conditions at time of the 2014 Field Investigation

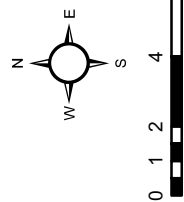
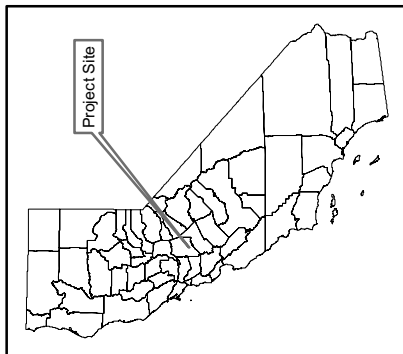
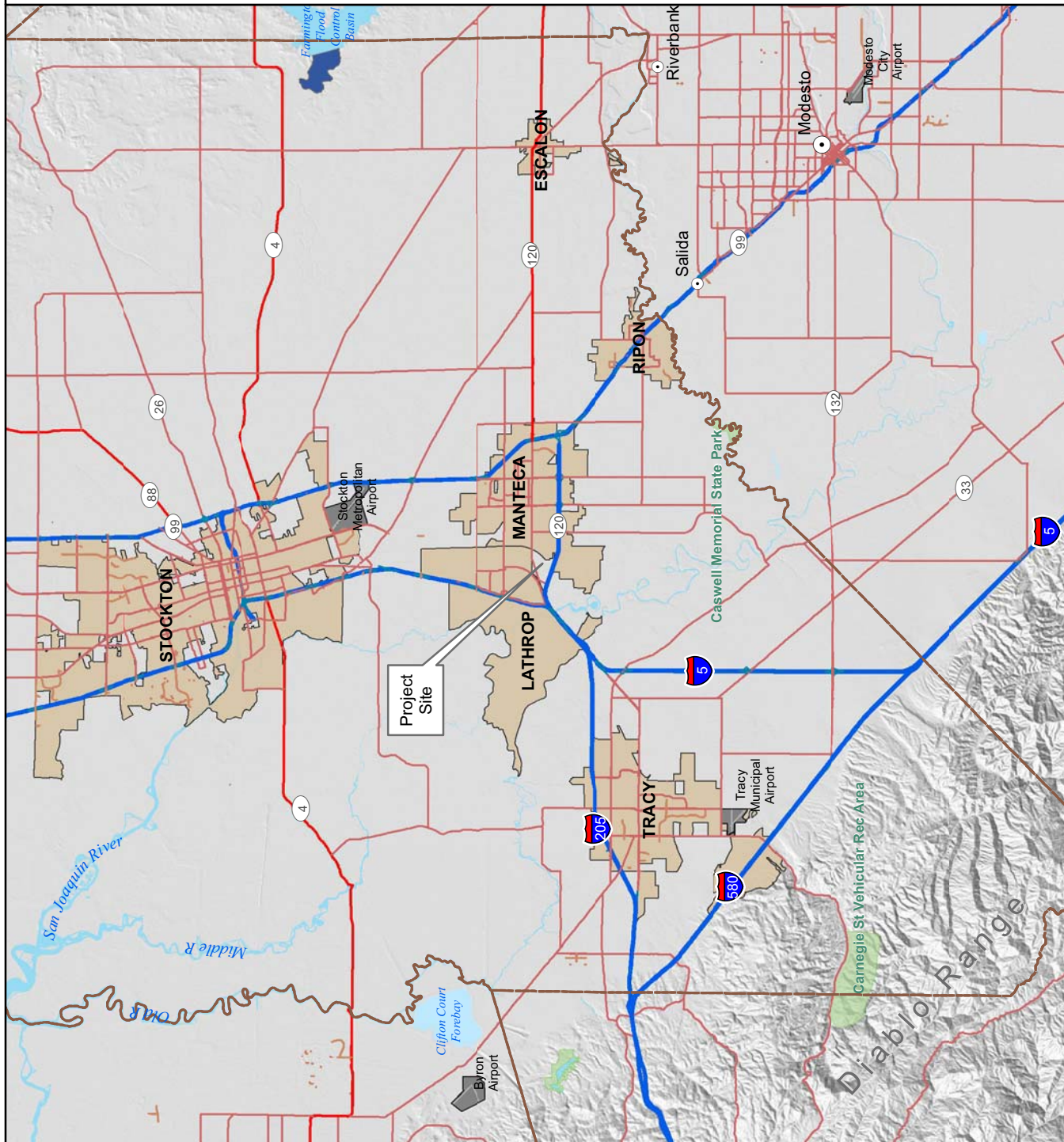
The Central Valley of California was experiencing severe to extreme drought conditions from January 2013 through April 2014 preceding the 2014 field surveys of the Other Waters (French Camp Canal). Table 2 provides meteorological information for the 2013-2014 calendar years.

TABLE 2: LONG-TERM METEOROLOGICAL CONDITIONS 2013-2014

DATE	PALMER SEVERITY INDEX
January-2013	Severe Drought
February - July -2013	Extreme Drought
August - October-2013	Severe Drought
November - December -2013	Extreme Drought
January - April-2014	Extreme Drought

SOURCE: NOAA PALMER DROUGHT SEVERITY INDEX LONG-TERM HYDROLOGICAL CONDITIONS, (2014)

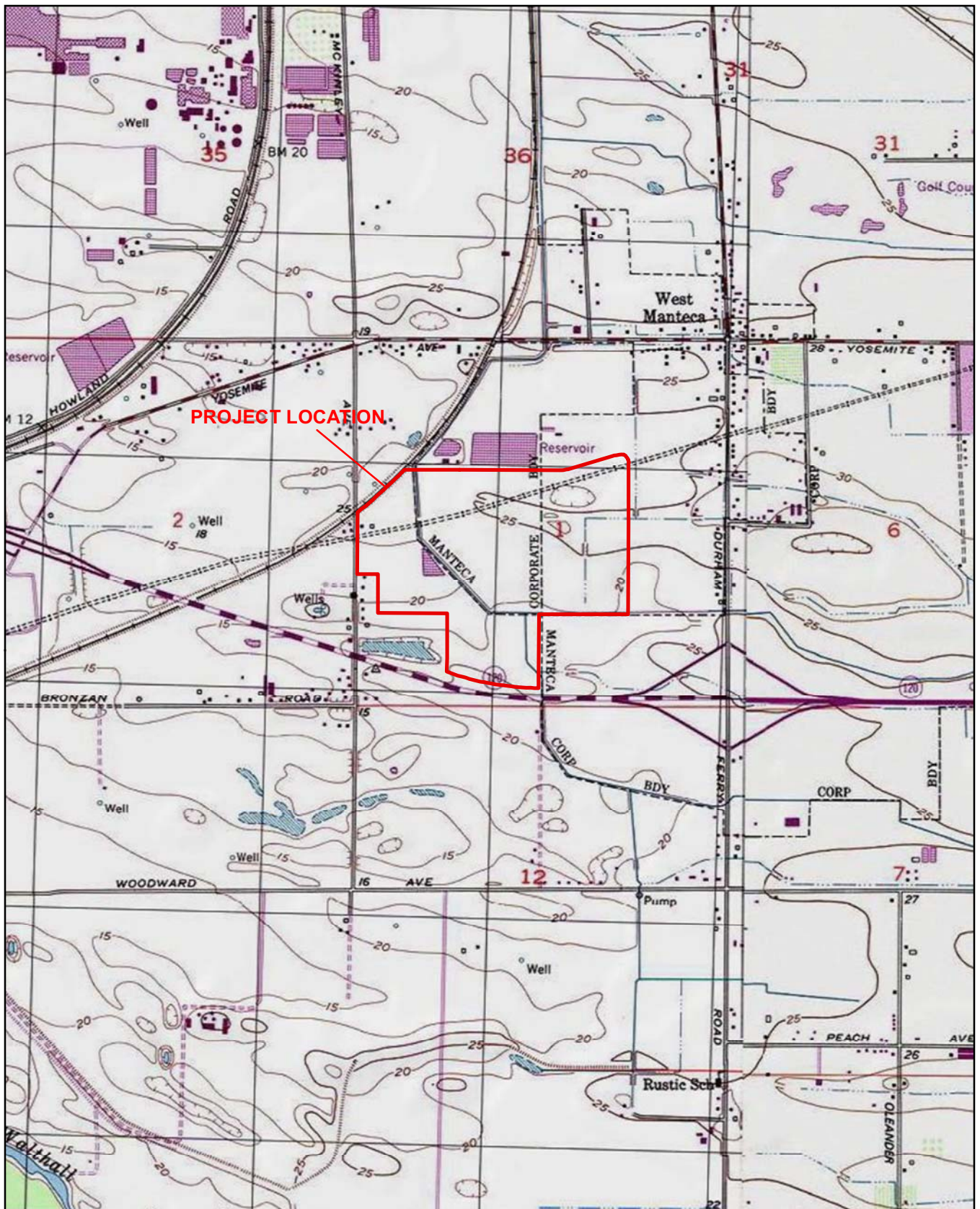
Figure 2-1: Regional Location Map



1:350,000

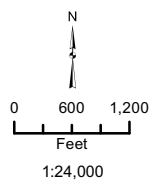
Data sources: California Spatial Information Library
and ESRI StreetMap North America.
Map date: February 7, 2011.

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MANTECA FAMILY ENTERTAINMENT ZONE PROJECT

Figure 2-2: USGS Topographic Map



Data sources: ArcGIS Online USA Topo Maps. Map date: October 10, 2014.

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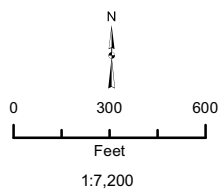
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Project Boundary

MANTECA FAMILY ENTERTAINMENT ZONE PROJECT

Figure 2-3: Aerial Photo



Data sources: ArcGIS Online Basemap Imagery with Transportation. Map date: October 10, 2014.

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Soils

The USDA/NRCS Web Soil Survey indicates the presence of five soil series occurring within the Project site, as shown in Table 3 below. Figure 2-4 illustrates the location of each soil series within the Project site.

TABLE 3: USDA SOIL SERIES INFORMATION

SOIL SERIES	DESCRIPTION	SOURCE MATERIAL	PEDON/DEPTH	DRAINAGE
Bisgani	loamy coarse sand, partially drained, 0 to 2 percent slopes	Alluvium derived from granitic rock sources	40 to 60 inches	Poorly drained
Delhi	Loamy sand, 0 to 2 percent slopes	Wind-modified alluvium	40 to 60 inches	Well drained
Timor	Loamy sand, 0 to 2 percent slopes	Alluvium derived from granitic rock sources	50 to 60 inches	Well drained
Tinnin	Loamy coarse sand, 0 to 2 percent slopes	Alluvium derived from granitic rock sources	53 to 75 inches	Well drained
Veritas	Fine sandy loam, 0 to 2 percent slopes	Alluvium derived from mixed rock sources	54 to 70 inches	Moderately well drained

SOURCE: USDA/NRCS, WEB SOIL SURVEY, 2/9/2011.

Bisgani loamy coarse sand, partially drained, 0 - 2% slopes: The Bisgani series consists of very deep, poorly drained soils that formed in mixed alluvium dominantly from granitic rock sources. Bisgani soils are on bars, flood plains, low alluvial fans, basins floors and valley basins. This series typically has a Mollic epipedon with an Aquic moisture regime. Bisgani loamy coarse sand, partially drained, 0 - 2% slopes is included on the NRCS National Hydric Soils List with a hydric component percent of 85.

The color range for the A horizon (0 to 22 inches) in the Bisgani series is 10YR 4/1, 4/2, 5/1, 5/2, 8/1; 2.5Y 4/2 or 5/2. The moist colors of this horizon have a lower value and range from 10YR 2/1, 3/1, 3/2, 3/3; or 2.5Y 3/2. Texture is sandy loam, loamy sand or loamy coarse sand. The Ap horizon in some pedons has an overwash of clay loam. Some pedons are slightly effervescent.

The color range for C horizon (22 to 43 inches) has color of 10YR 6/1, 6/2, 6/3, 7/1, 7/2, 7/3, 8/1. 2.5Y 6/2, 7/1, 7/2; or N 7/0. Moist color is 10YR 3/2, 4/2, 4/3, 5/3, 5/4; 2.5Y 4/2, 5/2, 5/4 or 6/2; 5Y 4/1, 4/2. Texture is sandy loam, loamy sand, loamy coarse sand, coarse sand or sand. Some pedons have 2 to 5 percent fine gravel.

Delhi loamy sand, 0 - 2% slopes: The Delhi series consists of somewhat excessively drained soils on dunes. These soils are very deep. They formed in wind-modified alluvium derived from granitic rock sources. Slope ranges from 0 to 5 percent. Soils of the Delhi series are mixed, thermic, Typic Xeropsamments. Typical pedon of Delhi loamy sand, 0 to 2 percent slopes. The content of clay is 0 to 5 percent. Reaction is slightly acid to mildly alkaline. Delhi loamy sand, 0 - 2% slopes is not included on the NRCS National Hydric Soils List.

The A horizon has color of 10YR 4/3, 5/2, 5/3, 5/4, or 6/2. When moist, it has color of 10YR 4/2 or 4/3. It is fine sand or loamy sand.

The C horizon has color of 10YR 5/2, 6/1, 6/2, 6/3, 6/4, 7/1, 7/2, 7/3, or 7/4. When moist, it has color of 10YR 5/1, 5/2, 5/3, 5/4, 6/1, 6/2, 6/3, or 6/4. It is fine sand, loamy sand, or sand.

Timor loamy sandy, 0 - 2% slopes: The Timor series consists of moderately well drained soils on low fan terraces or alluvial fans. These soils are deep to a hardpan. They formed in alluvium derived from granitic rock sources. Slope ranges from 0 to 2 percent. Soils of the Timor series are sandy, mixed, thermic Entic Haploxerolls. Typical pedon of Timor loamy sand, 0 to 2 percent slopes. Depth to the duripan is 40 to 60 inches. The depth to distinct and prominent mottles is 30 to 48 inches. Timor loamy sand, 0 - 2% slopes is included on the NRCS National Hydric Soils List with a hydric component percent of 3.

The A horizon has color of 10YR 5/2, 5/3, 4/2, or 4/3. When moist, it has color of 10YR 2/2, 3/2, or 3/3. It is neutral or mildly alkaline.

The Bk horizon has color of 10YR 4/4, 5/3, 5/4, 6/2, 6/3, or 6/4. When moist, it has color of 10YR 5/4, 5/3, 4/4, 4/3, 4/2, or 3/3. It is mildly alkaline or moderately alkaline.

The 2Bkqm horizon has color of 10YR 7/3, 7/2, 7/1, 6/2, or 6/1. When moist, It has color of 10YR 5/2 or 2.5Y 5/2.

Tinnin loamy coarse sand, 0 - 2% slopes: The Tinnin series consists of very deep, well drained soils formed in predominantly granitic alluvium or eolian sands. Tinnin soils are on low alluvial terraces of fans and narrow ridges and mounds and have slopes of 0 to 9 percent. This series is typically a Mollic epipedon. Tinnin loamy coarse sand, 0 - 2% slopes is not included on the NRCS National Hydric Soils List.

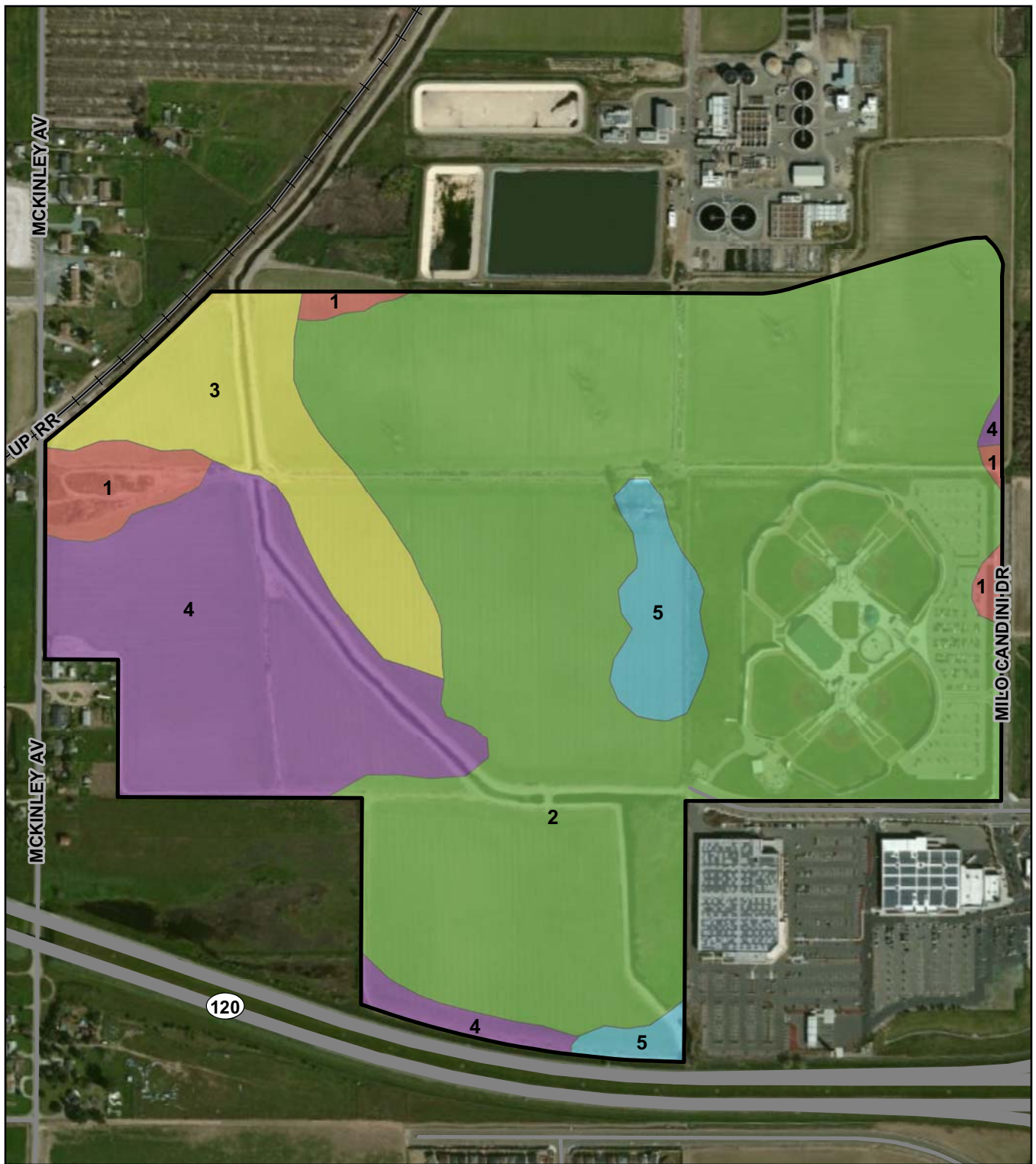
The color range for A horizon (0-28 inches) is 10YR 5/2, 5/3, 4/2, or 4/3 and 10YR 2/2, 3/2 or 3/3 moist. It is loamy coarse sand, loamy sand, fine sand or sand. It is slightly acid to mildly alkaline. This horizon has 1 to 3 percent organic matter.

The color range for the C horizon (28-75 inches) is 10YR 4/4, 5/3, 5/4, 6/2, 6/3, 6/4, 7/2, 7/3 or 7/4, and moist color of 10YR 5/4, 5/3, 4/4, 4/3, 4/2, 3/3 or 3/4. It commonly is loamy coarse sand or loamy sand, but includes sand in the lower part of some pedons. The upper C horizon is slightly acid to mildly alkaline, and the lower C horizon is neutral to moderately alkaline.

Veritas fine sandy loam, 0 - 2% slopes: The Veritas series consists of deep to duripan, moderately well drained, soils that formed in alluvium derived from mixed rock sources. Veritas soils are on low fan terraces with slopes of 0 to 2 percent. This series typically has a Mollic epipedon. Veritas fine sandy loam, 0 - 2% slopes is included on the NRCS National Hydric Soils List with a hydric component percent of 2.

The color range for the A horizon (0-15 inches) is 10YR 5/1, 5/2 or 4/2 and moist color of 10YR 3/2 or 3/1. It is neutral to moderately alkaline. Organic matter ranges from 1 to 2 percent.

The color range for the B horizon (15-70 inches) is 10YR 5/4, 5/3, 5/1, 6/3, 6/4, 6/2 or 2.5Y 6/2 and moist color of 10YR 4/3, 4/2, 4/1 or 2.5Y 4/2. It is mildly or moderately alkaline.



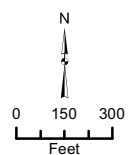
Project Boundary

Map Label: Soil Description

- 1: Delhi loamy sand, 0 to 2 percent slopes, MLRA 17
- 2: Bisgani loamy coarse sand, partially drained, 0 to 2 percent slopes
- 3: Timor loamy sand, 0 to 2 percent slopes
- 4: Tinnin loamy coarse sand, 0 to 2 percent slopes
- 5: Veritas fine sandy loam, 0 to 2 percent slopes

MANTECA FAMILY ENTERTAINMENT ZONE PROJECT

Figure 2-4: Soil Map



Data sources: USDA NRCS Web Soil Survey San Joaquin County, California, v7, November 2013.
Map date: August 21, 2014.

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Vegetation

Vegetation on the Project site can be broken up into upland and wetland communities in the undeveloped portion of the Project site, as well as urban landscaping in the existing developed Big League Dreams Sports Park. Common plant species observed within the upland communities include: wild oat (*Avena barbata*), rip-gut brome (*Bromus diandrus*), softchess (*Bromus hordeaceus*) alfalfa (*Medicago sativa*), Russian thistle (*Salsola tragus*), Italian thistle (*Carduus pycnocephalus*), rough pigweed (*Amaranthus retroflexus*), sunflower (*Helianthus annuus*), tarragon (*Artemisia dracunculus*), coyote brush (*Baccharis pilularis*), telegraphweed (*Heterotheca grandiflora*), prickly lettuce (*Lactuca serriola*), milk thistle (*Silybum marianum*), sow thistle (*Sonchus asper*), telegraph weed (*Heterotheca grandiflora*), prickly lettuce (*Lactuca serriola*), barley (*Hordeum* sp.), milkthistle (*Silybum marianum*), mustard (*Brassica niger*), and heliotrope (*Heliotropium curassavicum*).

Common plant species in the wetland communities include: tapertip rush (*Juncus acuminatus*), tule (*Schoenoplectus acutus*), arroyo willow (*Salix lasiolepis*), hyssop loosestrife (*Lythrum hyssopifolia*), curly dock (*Rumex crispus*), black willow (*Salix goodingia*), stinging nettles (*Urtica dioica*), poison hemlock (*Conium maculatum*), willow herb (*Epilobium brachycarpum*), horseweed (*Conyza canadensis*), Canadian waterweed (*Elodea canadensis*), prickly lettuce (*Lactuca serriola*), cottonwood (*Populus fremontii*), spiny sowthistle (*Sonchus asper*), horehound (*Marrubium vulgare*), cocklebur (*Xanthium strumarium*), and yellow sweetclover (*Melilotus officinalis*).

HYDROLOGY

Watershed Description

Watershed information is summarized in Table 4 and illustrated in Figure 2-5.

TABLE 4: WATERSHED INFORMATION

HYDROLOGIC INFORMATION	DESCRIPTION	ACRES	SQUARE MILES	PERCENT OF WATERSHED
Hydrologic Unit	Middle San Joaquin - Lower Merced - Lower Stanislaus	1,130,757	1,766.80	100
Hydrologic Area	Manteca	84,980	133	7.515
Hydrologic Sub-Area	"Undefined" Sub-Area -535.1	NA	NA	NA
Drainage Area (D5)	Undetermined	NA	NA	NA

SOURCE: CALWATER 2.1.1, NATIONAL RESOURCES CONSERVATION SERVICE, IWMC.

Hydrogeomorphic Features

The Project site contains an irrigation ditch (French Camp Outlet Canal) that is part of an extensive network of irrigation ditches that are owned and operated by the South San Joaquin Irrigation District (SSJID). SSJID was formed in the early 1900s, at which time they built several dams for reservoirs and hundreds of miles of irrigation ditches to supply irrigation water to farms in the region. The French Camp Outlet Canal functions as an irrigation water drainage ditch for farms receiving SSJID irrigation water "upstream." The irrigation ditch drains upland agricultural irrigation water from these farms during irrigation season. The SSJID provides regulatory maintenance and weed abatement to their entire system of irrigation ditches.

The French Camp Outlet Canal enters the Project site from the southeastern corner of the Project site and travels northwesterly for approximately 400 feet before turning northerly for approximately 675 feet. The French Camp Outlet Canal then turns westerly for approximately 525

feet. The French Camp Outlet Canal then turns northwesterly for approximately 1,000 feet, before turning northerly as it exits the Project site approximately 825 feet to the north.

The Project site also contains two wetlands. Wetland 1 and 2 are on the eastern side of the Project site between the property line and the French Camp Outlet Canal near the Stadium Shopping Center.

The remainder of the Project site is level agricultural property with agricultural roads and ancillary structures. There are no hydrological features on the remainder of the Project site. The agricultural fields are actively maintained in crops during the growing season.

Water Source

Surface flows within the French Camp Outlet Canal are derived primarily from drainage of upstream agricultural irrigation water. SSJID provides this water from their reservoirs to their customers through their extensive network of irrigation ditches. The irrigation water comes from SSJID reservoirs behind the Tulloch, New Melones, Beardsley, Goodwin, and Donnell's dams. Upstream farms (uplands) receive the water for irrigation, and excess water drains back into the SSJID irrigation ditches until it ultimately reaches the French Camp Outlet Canal. The French Camp Outlet Canal functions as an irrigation ditch that drains agricultural irrigation water from these farms (uplands) during irrigation season.

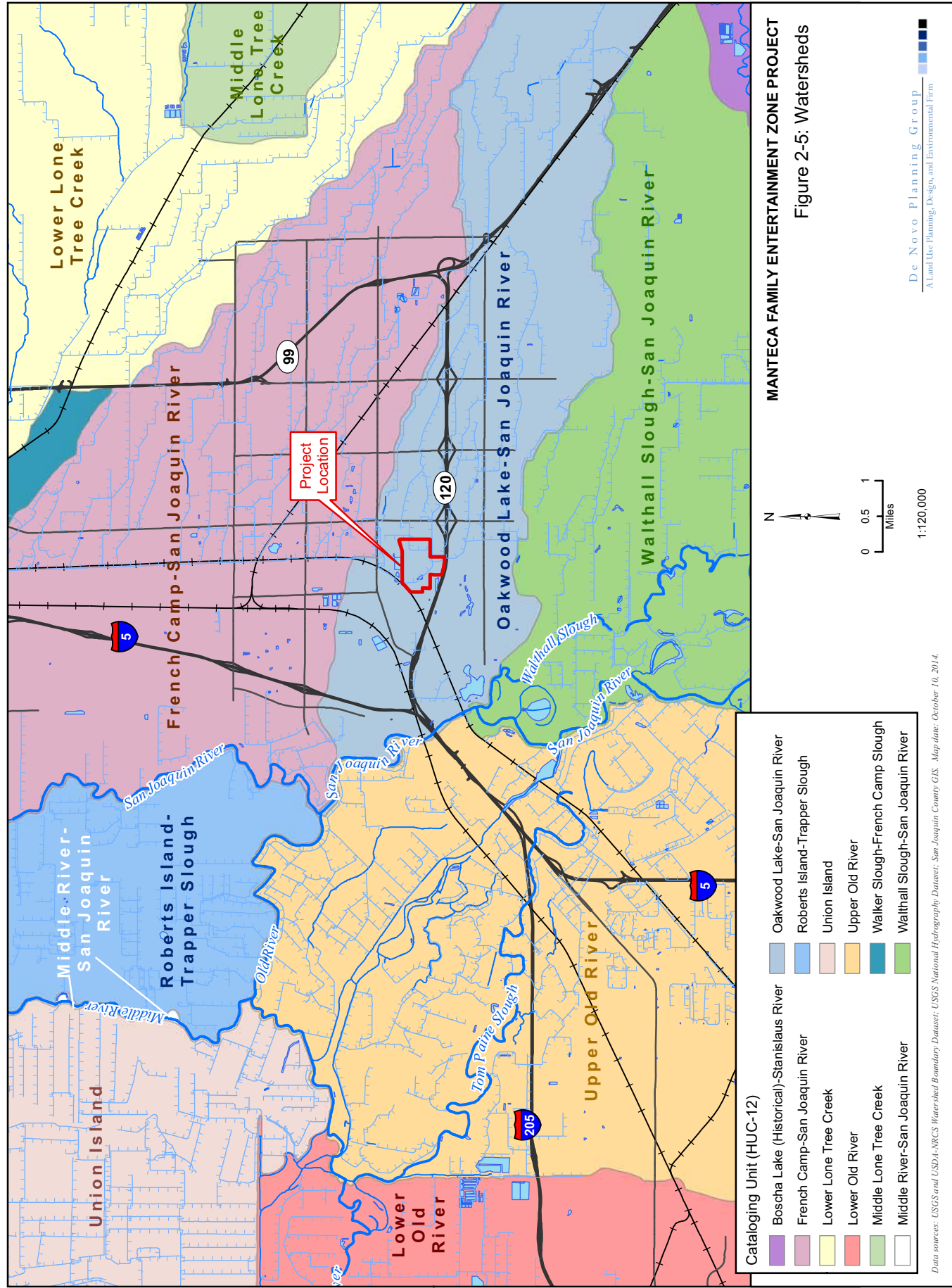
Irrigation season runs from approximately March 15 to October 15, depending on the weather. The canal network ultimately connects into the San Joaquin River approximately 12 miles north of the Project site.

Drainage Pattern

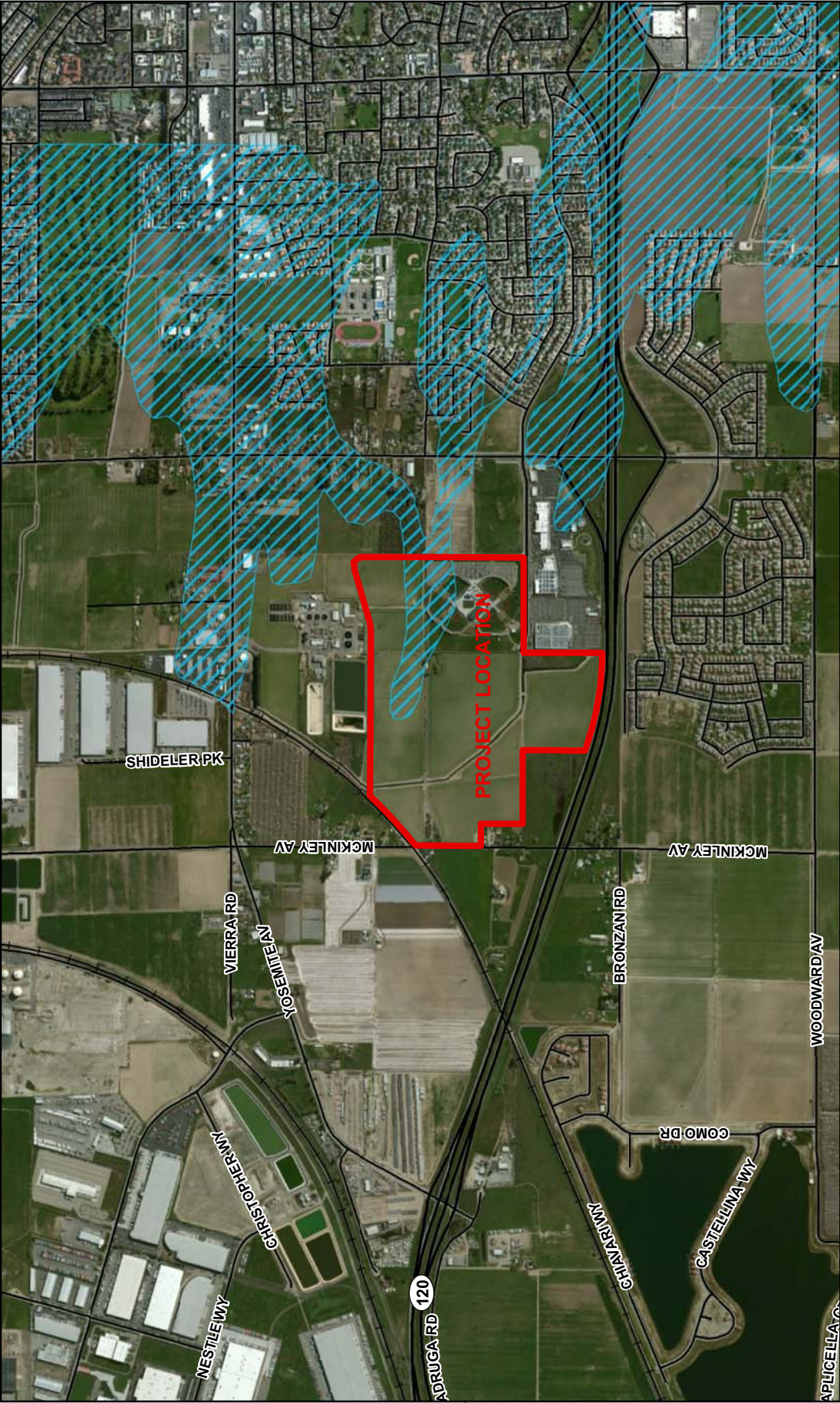
The region generally drains from east to west. The natural drainage pattern in the area is largely changed from its natural conditions due to agricultural activities. With the exception of the two wetlands and the French Camp Outlet Canal, there are no natural drainage patterns within the Project site.

The surface flows in the French Camp Outlet Canal travels northerly through the Project site and is fully contained within the banks of irrigation canal. The French Camp Outlet Canal is not known to overflow or otherwise cause flooding on adjacent properties, other than the two wetland areas within the Project site.

Wetland 1 is a low terrace that receives water from the French Camp Outlet Canal through a low point along the bank. The water is received during high flows, which occur during the summer irrigation season. Wetland 2 is an active floodplain that receives water along a portion of the French Camp Outlet Canal with no bank.



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MANTECA FAMILY ENTERTAINMENT ZONE PROJECT

Figure 2-6: FEMA Flood Map

 500-yr Flood Zone*

All other areas shown on this map extent are Zone X - areas of minimal hazard, with some areas protected by levee

Data sources: FEMA Map Service Center; San Joaquin County GIS; ArcGIS Online Imagery. Map date: October 10, 2014.

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Downstream Connectivity

The French Camp Outlet Canal has downstream connectivity to the San Joaquin River, a “Traditional Navigable Water” (TNW); however, it should be noted that connectivity is controlled with man-made structures that prevent tidal influence and movement of fish upstream into the canal. There is no anadromous fish movement from the San Joaquin River into the French Camp Outlet Canal. Downstream connectivity is summarized in Table 5 (below).

TABLE 5: DISTANCE TO DOWNSTREAM RESOURCES

DOWNSTREAM RESOURCE (NAME)	TYPE	LENGTH (FEET)	LENGTH (MILES)
French Camp Outlet Canal	Tributary	40,027.85	7.58
Unnamed Stream	Tributary	5,889.55	1.12
French Camp Slough (Artificial Path)	Tributary	17,213.03	3.26
San Joaquin River	TNW	N/A	N/A

SOURCE: USGS NATIONAL HYDROGRAPHY DATA SET, FEBRUARY 11, 2011

FEMA Flood Map

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for areas indicates that most of the project area is protected by a levee and is designated as X, having an annual probability of flooding less than 0.2 percent (or 500 year flood). The eastern portion of the project area is shown as being within the 500 year flood area, although the flood source is not outside hydrologic features. The FEMA Flood Zone Map for the area is shown in Figure 2-6.

RESULTS

SUMMARY

Table 6 provides a summary of USACE delineated features present onsite. Figure 2-7 illustrates the hydrological features, including the USACE jurisdictional and non-jurisdictional areas, on the entire Project site. A CDFW jurisdictional map is provided in Figure 2-8. In addition, the following information is provided in the attached appendices: Cross Sections, Site Photographs, Wetland data forms, and OHWM forms. A detailed discussion of the rationale for the jurisdictional determination follows. The USACE, with oversight by the Environmental Protection Agency (EPA), will make the final U.S. jurisdictional determination.

TABLE 6: SUMMARY OF USACE DELINEATED FEATURES

FEATURE	TYPE	AREA (ACRE)	USACE JURISDICTION (RATIONALE)
French Camp Outlet Canal	Channelized soft-bottom irrigation ditch created in uplands for the purpose of draining surface water from agricultural uplands during spring/summer, and for storm drainage during rain events.	2.98	No (Irrigation Ditch Exemption pursuant to Federal Regulations (33 CFR 323.4(a)(3)). Discharges for the construction or maintenance of farm or stock ponds or irrigation ditches have been exempted from requiring a Section 404 permit. The South San Joaquin Irrigation District's network of irrigation ditches/canals, including siphons, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant and functionally related to their irrigation ditches/canals are included in this exemption. This section of irrigation ditch/canal drains agricultural uplands, is a man-made structure, is regularly maintained by SSJID, is non-tidal, and does not support anadromous fish due to a downstream structure that controls out-flows.
Wetland 1	Seasonal wetland	1.19	Yes (presence of wetland indicators).
Wetland 2	Perennial wetland	1.25	Yes (presence of wetland indicators).
<i>Total Delineated Features</i>		<i>5.42</i>	
Total USACE Jurisdictional Area		2.44	

SOURCE: DE NOVO PLANNING GROUP, INC., 2011 AND 2014.

Table 7 provides a summary of CDFW delineated features present onsite. CDFW Jurisdiction was measured to the top of bank or to the outer extent of associated riparian vegetation (including adjacent wetlands). A detailed discussion of the rationale for the jurisdictional determination follows. The CDFW will make the final California jurisdictional determination.

TABLE 7: SUMMARY OF CDFW DELINEATED FEATURES

FEATURE	TYPE	AREA (ACRE)	CDFW JURISDICTION (RATIONALE)
French Camp Outlet Canal	Channelized soft-bottom irrigation ditch created in uplands for the purpose of providing surface water for agricultural use during spring/summer, and for storm drainage during rain events.	3.61	No (Irrigation Ditch is not regulated under the Fish and Game Code (FGC) §1602. The South San Joaquin Irrigation District's network of irrigation ditches/canals, including siphons, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant and functionally related to their irrigation ditches/canals are not a river, stream, or lake as defined in FGC §1602.) This section of irrigation ditch/canal drains agricultural uplands, is a man-made structure, is regularly maintained by SSJID, is non-tidal, and does not support anadromous fish due to a downstream structure that controls out-flows.
Wetland 1	Seasonal wetland- low terrace	1.19	Yes (presence of wetland indicators).
Wetland 2	Perennial wetland - active floodplain	1.25	Yes (presence of wetland indicators).
<i>Total Delineated Features</i>		<i>6.05</i>	
Total CDFW Jurisdictional Area		2.44	

SOURCE: DE NOVO PLANNING GROUP, INC., 2011 AND 2014.

RATIONALE

French Camp Outlet Canal

UPSTREAM/DOWNSTREAM CONNECTIVITY

The French Camp Outlet Canal enters the Project site from the southeastern corner of the Project site and travels northwesterly for approximately 400 feet before turning northerly for approximately 675 feet. The French Camp Outlet Canal then turns westerly for approximately 525 feet. The French Camp Outlet Canal then turns northwesterly for approximately 1,000 feet, before turning northerly as it exits the Project site approximately 825 feet to the north.

Surface flows within the French Camp Outlet Canal are derived primarily from drainage of upstream agricultural irrigation water. SSJID provides this water from their reservoirs to their customers through their extensive network of irrigation ditches. The irrigation water comes from SSJID reservoirs behind the Tulloch, New Melones, Beardsley, Goodwin, and Donnell's dams. Upstream farms (uplands) receive the water for irrigation, and excess water drains back into the SSJID irrigation ditches until it ultimately reaches the French Camp Outlet Canal. The French Camp Outlet Canal functions as an irrigation ditch that drains agricultural irrigation water from these farms (uplands) during irrigation season. Irrigation season runs from approximately March 15 to October 15, depending on the weather.

The French Camp Outlet Canal has downstream connectivity to the San Joaquin River, a "Traditional Navigable Water" (TNW); however, it should be noted that connectivity is controlled with man-made structures that prevent tidal influence and movement of fish upstream into the canal. There is no anadromous fish movement from the San Joaquin River into the French Camp Outlet Canal.

OHWL DETERMINATION

The French Camp Outlet Canal is an artificially constructed soft-bottom conveyance with concrete headwalls that are associated with access bridges and entry points. The OHWM was clearly visible on the southernmost portion of the French Camp Outlet Canal where the water flows enter the Project site from under State Route 120. This location has a headwall constructed of concrete poured over riprap. The OHWM is easily visible from water stains on the concrete. The OHWM within other portions of the French Camp Outlet Canal were also easily discernible from water marks on the bank of the French Camp Outlet Canal. The OHWM is at elevation 19ft.

ADJACENT WETLANDS

Wetlands 1 and 2 are adjacent to the French Camp Outlet Canal and exist directly as a result of the water flows in the French Camp Outlet Canal. The top of bank of the French Camp Outlet Canal is not at an equal elevation around the entirety of the French Camp Outlet Canal. A portion of the eastern side of the French Camp Outlet Canal does not have a defined bank, and another portion has a low bank. This change in bank elevation allows flooding of the adjacent wetlands during periods of high flows within the French Camp Outlet Canal. The high flows in the French Camp

Outlet Canal are associated with the irrigation season, which occurs generally from March 15 to October 15.

USACE JURISDICTION

The French Camp Outlet Canal is part of an extensive network of irrigation ditches that are owned and operated by the South San Joaquin Irrigation District (SSJID). SSJID was formed in the early 1900s, at which time they built several dams for reservoirs and hundreds of miles of irrigation ditches to supply irrigation water to farms in the region. The French Camp Outlet Canal functions as an irrigation water drainage ditch for farms receiving SSJID irrigation water “upstream.” The irrigation ditch drains upland agricultural irrigation water from these farms during irrigation season. The SSJID provides regulatory maintenance and weed abatement to their entire system of irrigation ditches. This SSJID network of ditches/canals fall under the Irrigation Ditch Exemption pursuant to Federal Regulations (33 CFR 323.4(a)(3)). Specifically, discharges for the construction or maintenance of farm or stock ponds or irrigation ditches have been exempted from requiring a Section 404 permit. While the French Camp Outlet Canal has upstream and downstream connectivity to a TNW through the network of ditches/canals, they were anthropogenically created in uplands and the flows are controlled for irrigation purposes, before it ultimately outflows into the San Joaquin River.

CDFW JURISDICTION

The French Camp Outlet Canal is an artificially constructed Irrigation Ditch and is not regulated under the Fish and Game Code (FGC) §1602. The South San Joaquin Irrigation District’s network of irrigation ditches/canals, including siphons, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant and functionally related to their irrigation ditches/canals are not a river, stream, or lake as defined in FGC §1602.

Wetland 1

HYDROLOGY

Wetland 1 is seasonal wetland and exists directly as a result of the water flows in the French Camp Outlet Canal. The top of bank of the French Camp Outlet Canal is not at an equal elevation around the entirety of the French Camp Outlet Canal. A portion of the eastern side of the French Camp Outlet Canal has a low bank, which allows flooding of Wetland 1 during periods of high flows within the French Camp Outlet Canal. Wetland 1 is a low-terraced seasonal wetland that receives water during the irrigation season, which occurs generally from March 15 to October 15. Surface hydrology was not present during the field survey.

SOILS

The soils in Wetland 1 are classified as Bisgani loamy coarse sand, partially drained, 0 - 2% slopes. This soil is included on the NRCS National Hydric Soils List. The Bisgani series consists of very deep, poorly drained soils that formed in mixed alluvium dominantly from granitic rock sources. Bisgani soils are on bars, flood plains, low alluvial fans, basins floors and valley basins. This series is

typically a Mollic epipedon with an Aquic moisture regime. The detailed description of this soil series is provided previously in the Soil section.

The test pits within Wetland 1 were dug to 16 inches. The soil was moist and showed a low chroma, except for the oxidized root channels. Moist colors ranged from 10YR 2/2, 3/1, 3/2, 3/3, 4/2, and 5/2. Some areas had oxidized root channels with moist colors of 10YR 5/6. The value and chroma characteristics are largely consistent with the official description for this soil type.

VEGETATION

The Project site lies within the North San Joaquin Subdivision of the California Floristic Province and lies within the Mediterranean California (LRR C) region. The dominate vegetation within Wetland 1 is *Juncus acuminatus* (OBL), which is approximately 90 percent of the area. Wetland 1 has *Rumex crispus* (FacW), and *Conium maculatum* (Fac) each occurring in approximately five percent of the area. Other hydrophytic vegetation observed includes *Urtica dioica* (FacW) and *Sonchus asper* (Fac), although these occur on less than one percent of the area. Upland plants in Wetland 1 include: *Carduus pycnocephalus* (UPL), *Bromus diandrus* (UPL), *Silybum marianum* (UPL), *Brassica niger* (UPL), and soft chess (*Bromus hordeaceus*) (UPL). These upland plants were limited in Wetland 1, occurring less than 1 percent of the area. These upland plants became dominate in the area just outside Wetland 1.

USACE JURISDICTION

Wetland 1 is subject to USACE jurisdiction. Wetland 1 has the presence of hydrology, hydrophytic vegetation, and hydric soils.

CDFW JURISDICTION

Wetland 1 has the presence of hydrology, hydrophytic vegetation, and hydric soils. The presence of these indicators makes it subject to CDFW jurisdiction.

Wetland 2

HYDROLOGY

Wetland 2 is a perennial wetland and exists directly as a result of the water flows in the French Camp Outlet Canal. The top of bank of the French Camp Outlet Canal is not at an equal elevation around the entirety of the French Camp Outlet Canal. A portion of the French Camp Outlet Canal does not have a defined bank, which allows flooding of Wetland 2 during periods of higher flows within the French Camp Outlet Canal. Wetland 2 is an active floodplain that receives its water during the irrigation season (March 15 to Oct. 15) and during stormwater events (Oct. 15 to April 15), which makes it a perennial wetland. Surface hydrology was not present during the field survey, however, the site appeared to have been recently inundated. Test pits showed water at an average depth of eight inches, although the presence of water in test pits varied with distance to the French Camp Outlet Canal and the elevational gradient.

SOILS

The soil characteristics in Wetland 2 are similar to those documented in Wetland 1. The soils in Wetland 2 are classified as Bisgani loamy coarse sand, partially drained, 0 - 2% slopes. This soil is included on the NRCS National Hydric Soils List. The Bisgani series consists of very deep, poorly drained soils that formed in mixed alluvium dominantly from granitic rock sources. Bisgani soils are on bars, flood plains, low alluvial fans, basins floors and valley basins. This series is typically a Mollic epipedon with an Aquic moisture regime. The detailed description of this soil series is provided previously in the Soil section.

The test pits within Wetland 2 were dug to 16 inches. The soil was moist and showed a low chroma, except for the oxidized root channels. There was a larger buildup of organics in Wetland 2 compared to Wetland 1, which is expected in an active floodplain. Moist colors ranged from 10YR 2/2, 3/1, 3/2, 3/3, 4/2, and 5/2. Like Wetland 1, some areas had oxidized root channels with moist colors of 10YR 5/6. The value and chroma characteristics are largely consistent with the official description for this soil type.

VEGETATION

The Project site lies within the North San Joaquin Subdivision of the California Floristic Province and lies within the Mediterranean California (LRR C) region. Wetland 2 is an active floodplain that is a mosaic of three dominate vegetation types: 1) tule, 2) rush, and 3) willow/cottonwood.

The tule complex is dominated by *Schoenoplectus acutus* (OBL), which occurs on approximately 80 percent of Wetland 2. The rush complex is dominated by *Juncus acuminatus* (OBL), which occurs on approximately 10 percent of Wetland 2. This complex is limited to the area just below the ordinary high water mark of this active floodplain. Other vegetation within the rush complex includes: *Rumex crispus* (FacW), *Conium maculatum* (Fac), *Urtica dioica* (FacW), *Sonchus asper* (Fac), *Carduus pycnocephalus* (UPL), *Bromus diandrus* (UPL), *Silybum marianum* (UPL), *Brassica niger* (UPL), and *Bromus hordeaceus* (UPL), although these plants are limited in this area. The willow/cottonwood complex is dominated by *Salix goodingia* (FacW), *Salix lasiolepis* (OBL), and *Populus fremontii* (Fac), which occurs on approximately 10 percent of Wetland 2. This area has approximately two to four inches of dead plant matter (twigs, branches, and leaves) from the dominate tree species, and is completely void of ground vegetation.

USACE JURISDICTION

Wetland 2 is subject to USACE jurisdiction. Wetland 2 has the presence of hydrology, hydrophytic vegetation, and hydric soils.

CDFW JURISDICTION

Wetland 2 has the presence of hydrology, hydrophytic vegetation, and hydric soils. The presence of these indicators makes it subject to CDFW jurisdiction.

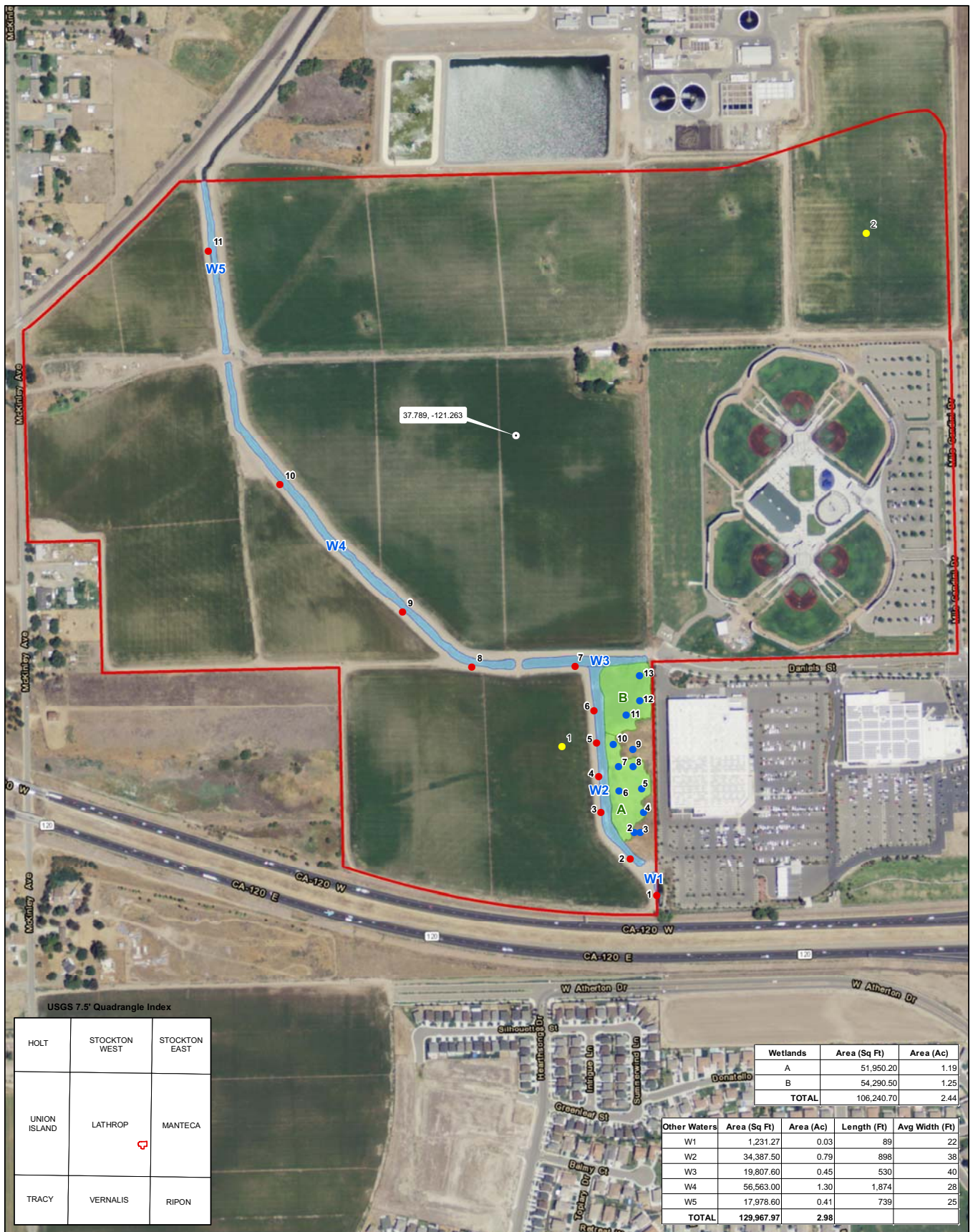


Figure 2-7: USACE Jurisdictional Map

Legend

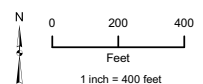
- Project Boundary (210.7 ac)
- Wetlands (2.44 ac, 106,240.70 sq ft)
- Other Waters (2.98 ac, 129,967.97 sq ft)
- OHWM Data Points
- Wetland Data Points
- Soil Sample Data Points
- Project Reference Point

Lathrop Quadrangle

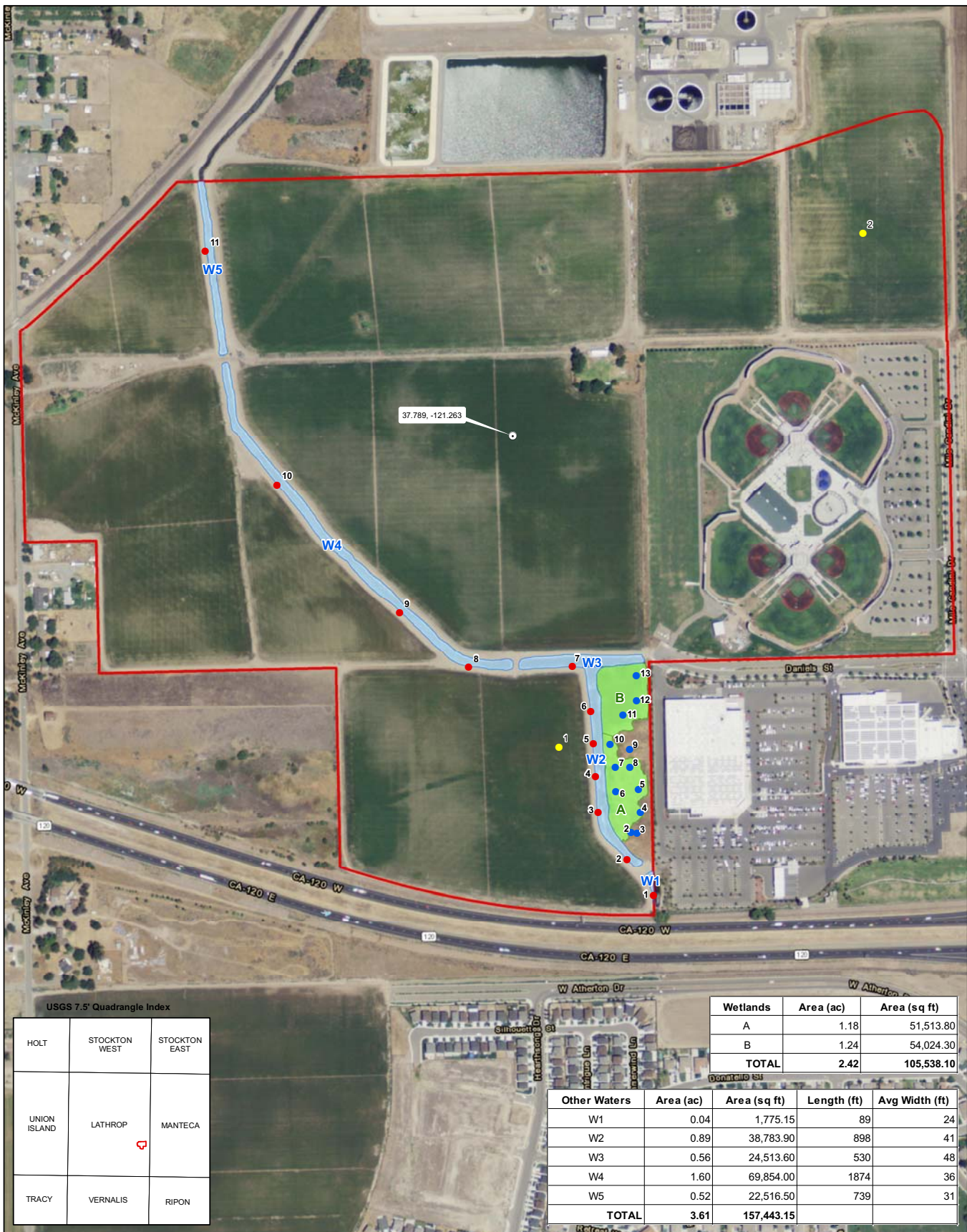
T2S, R6E, sec1

UTM 10N: 4183835.9N, 652920.29E

GCS NAD83: 37.79N, 121.26W



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Legend

- Project Boundary (210.7 ac)
- Wetlands (2.42 ac, 105,538.10 sq ft)
- Other Waters (3.61 ac, 157,443.15 sq ft)
- OHWM Data Points
- Wetland Data Points
- Soil Sample Data Points
- Project Reference Point

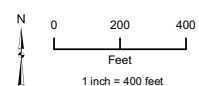
Figure 2-8: CDFW Jurisdictional Map

Lathrop Quadrangle

T2S, R6E, sec1

UTM 10N: 4183835.9N, 652920.29E

GCS NAD83: 37.79N, 121.26W



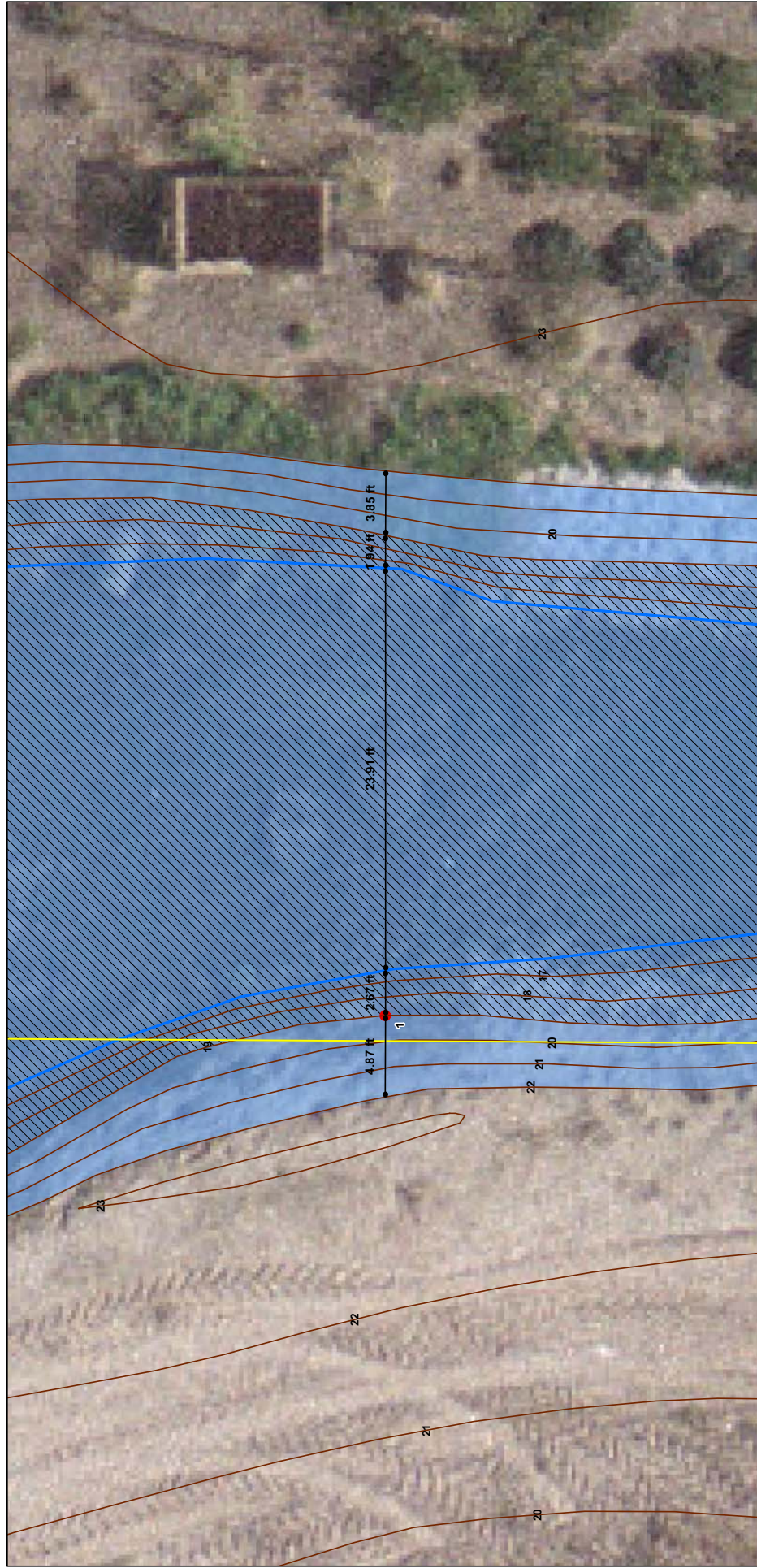
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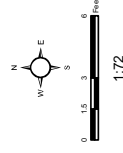
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APPENDIX A: SSJID CROSS SECTIONS



POINT 1 Cross Section

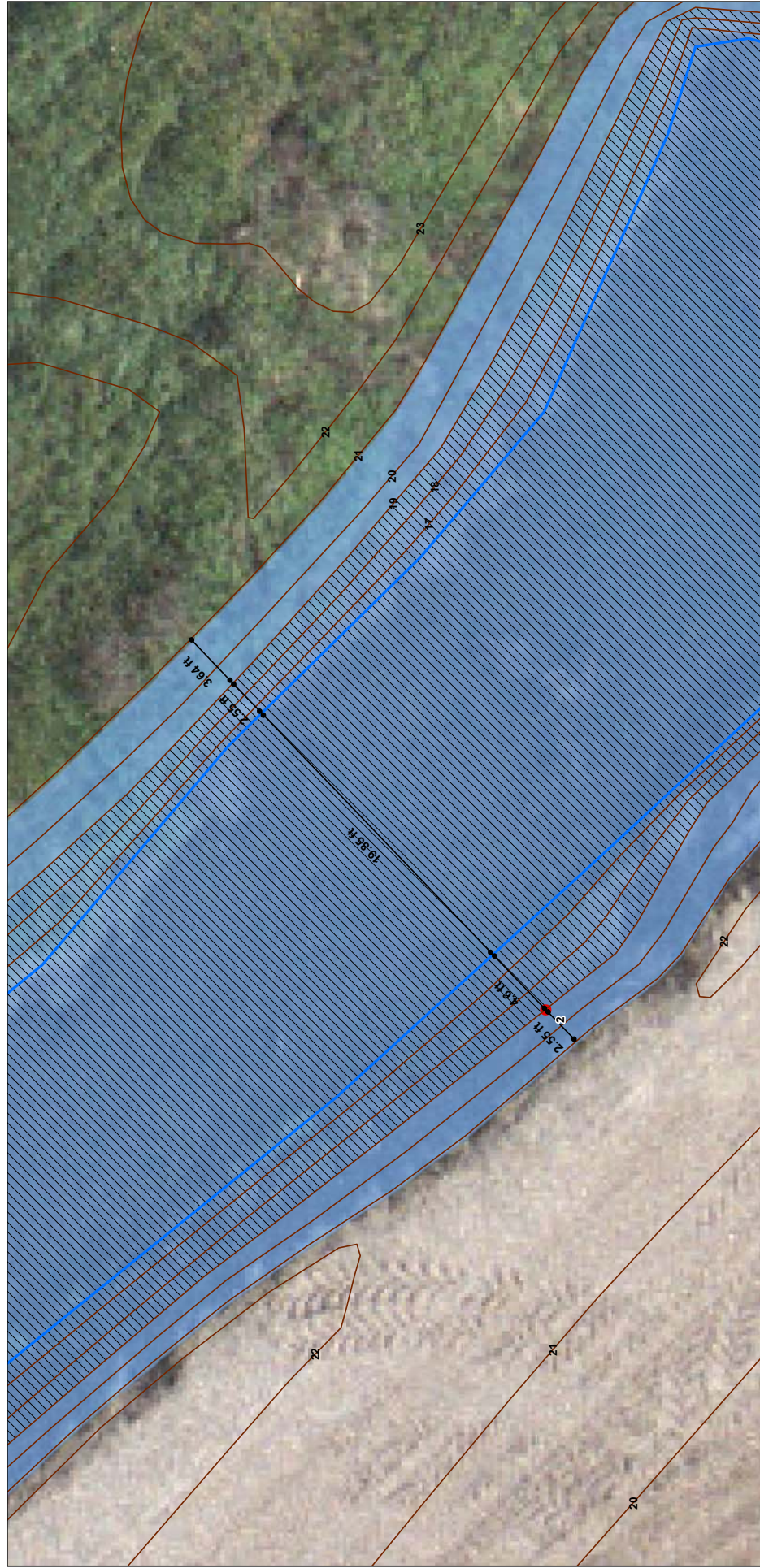
- OHWM Data Points
- Water Level
- USACE Wetlands (to OHWM)
- CDFG Wetlands (to TOB)
- Cross Section Lines
- Topo Survey
- Property Line



1 inch = 6 feet

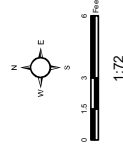
Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011. Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N, North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjcnmap.org. Map date: April 21, 2011.

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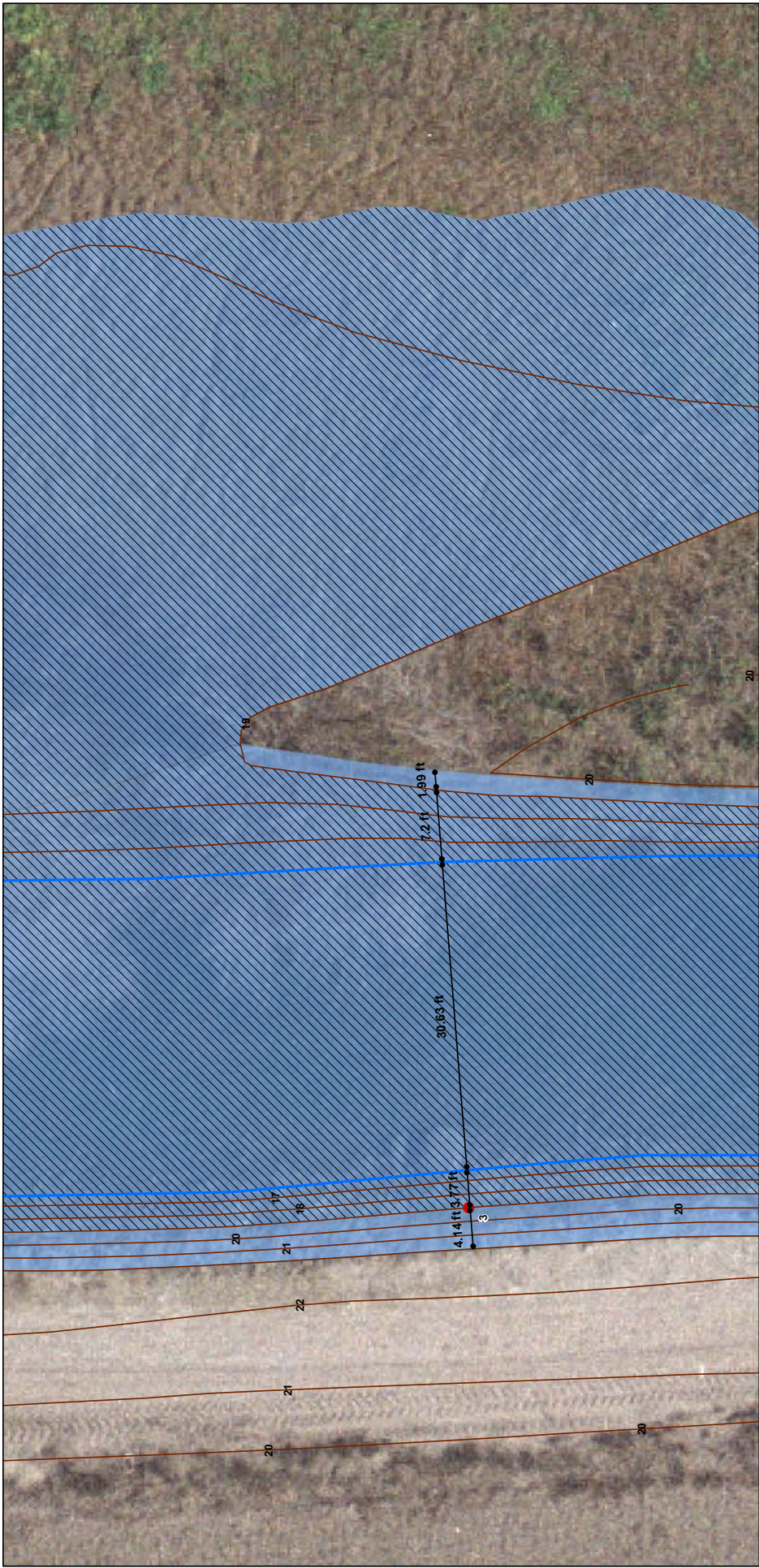
POINT 2 Cross Section

- OHWM Data Points
- Water Level
- Cross Section Lines
- Topo Survey
- /// USACE Jurisdiction (to OHWM)
- CDFG Jurisdiction (to TOB)



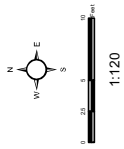
Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011. Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N, North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjgmap.org. Map date: April 21, 2011.

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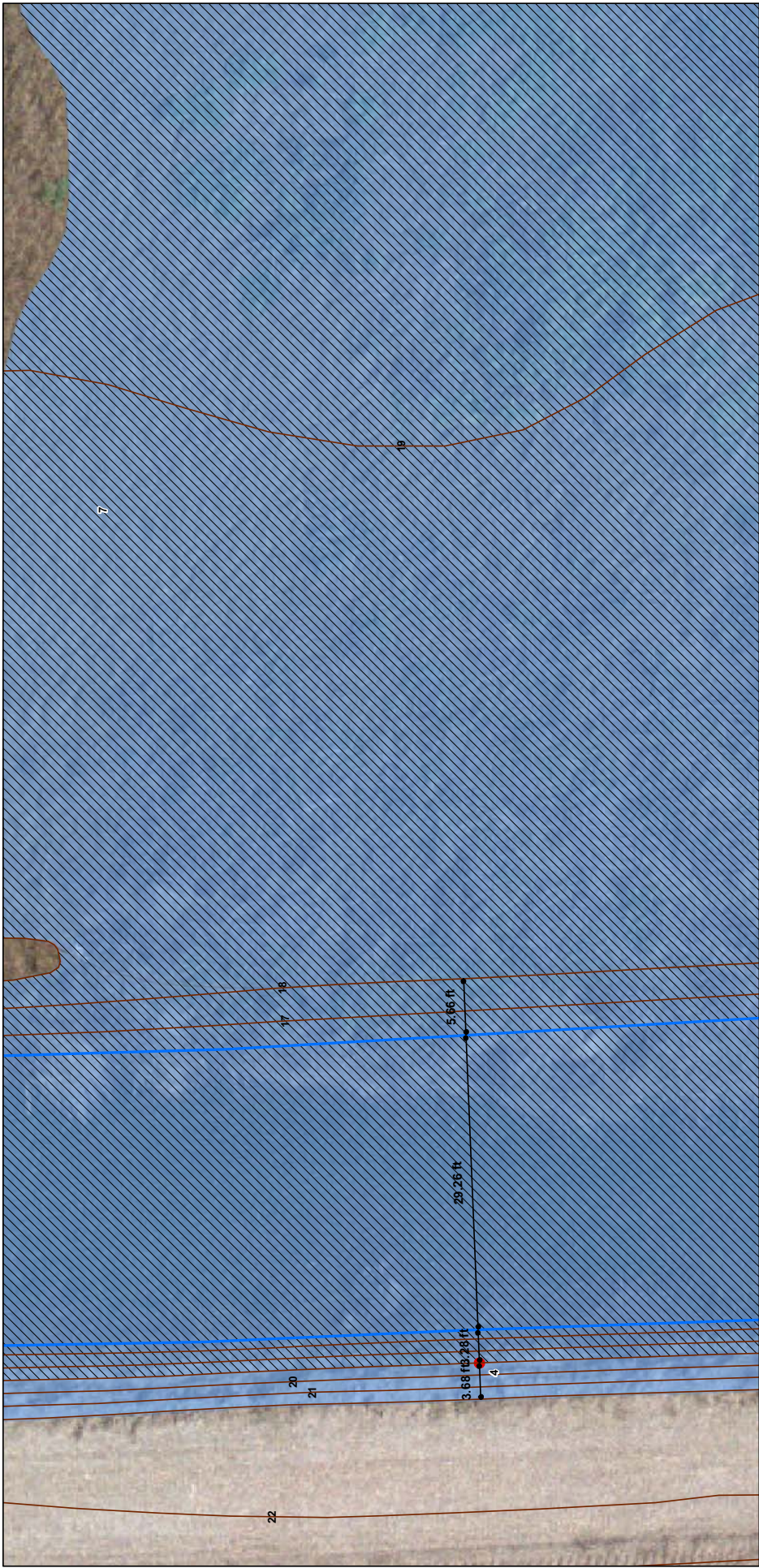
POINT 3 Cross Section

- OHWM Data Points
- Water Level
- USACE Jurisdiction (to OHWM)
- CDFG Jurisdiction (to TOB)
- Cross Section Lines
- Topo Survey

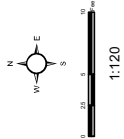


Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011. Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N, North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjgmap.org. Map date: April 21, 2011.

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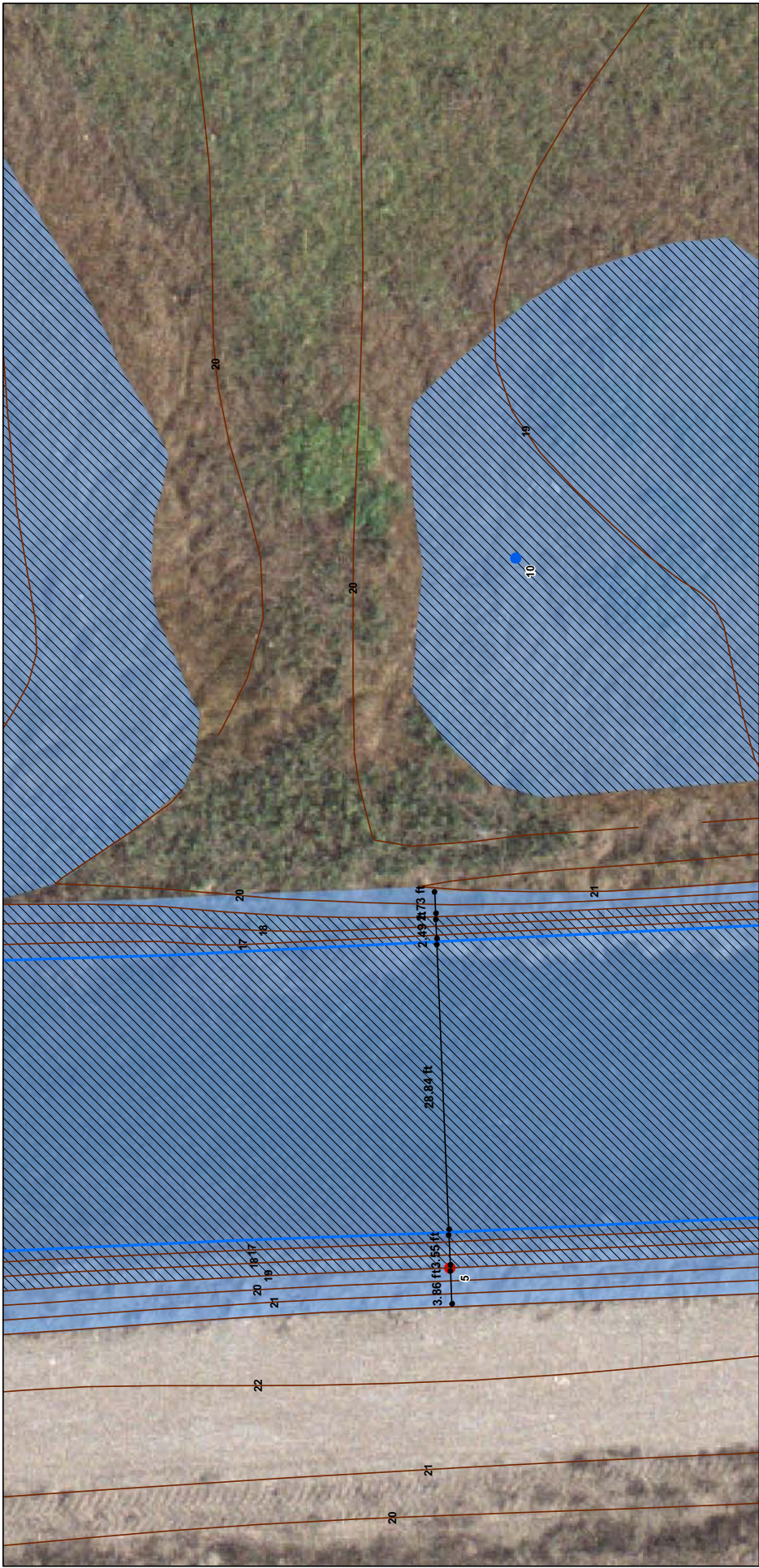


POINT 4 Cross Section



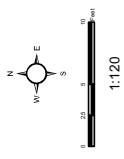
Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011. Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N, North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjgmap.org. Map date: April 21, 2011.

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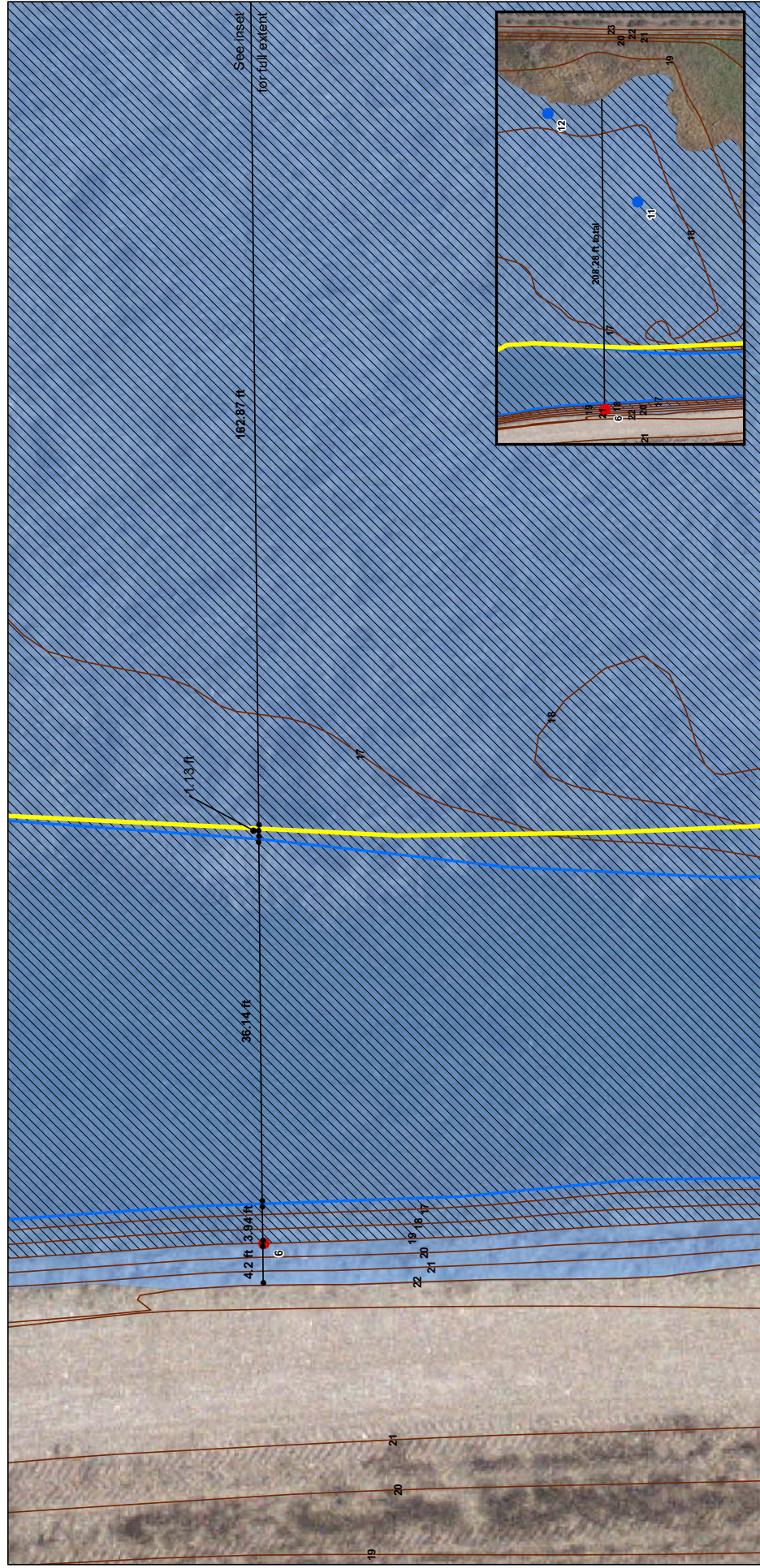
POINT 5 Cross Section

- OHWM Data Points
- Welland 1 & 2 Data points
- Water Level
- USACE Jurisdiction (to OHWM)
- CDFG Jurisdiction (to TOB)
- Cross Section Lines
- Topo Survey

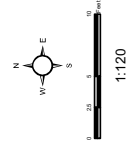


Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011. Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N, North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjcnmap.org. Map date: April 21, 2011.

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POINT 6 Cross Section

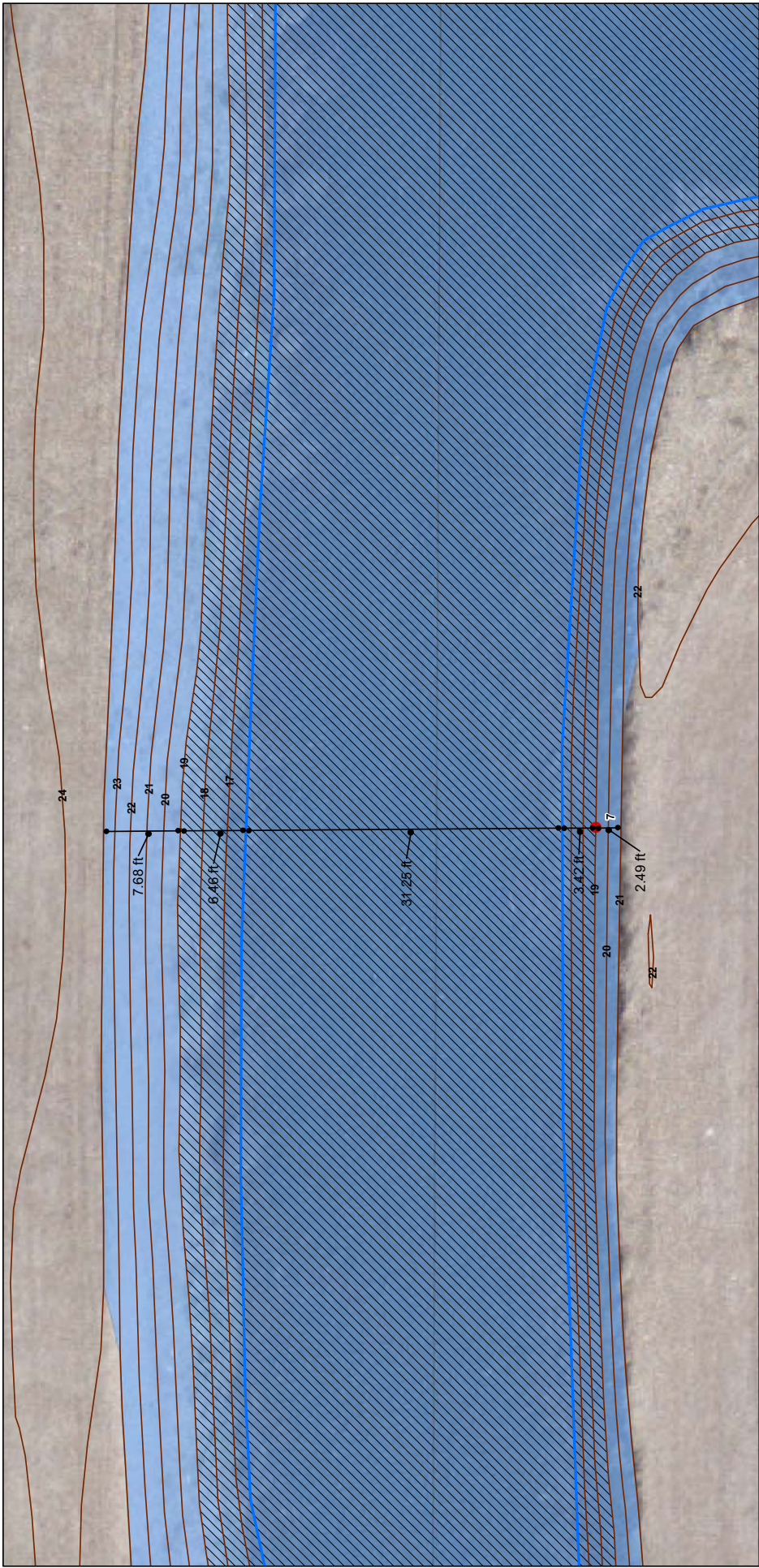


1 inch = 10 feet

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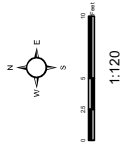
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Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011. Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N, North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjcmap.org. Map date: April 21, 2011.



POINT 7 Cross Section

- OHWM Data Points
- Wetland 1 & 2 Data points
- Cross Section Lines
- Topo Survey
- Water Level
- // USACE Jurisdiction (to OHWM)
- ⋈ CDFG Jurisdiction (to TOB)

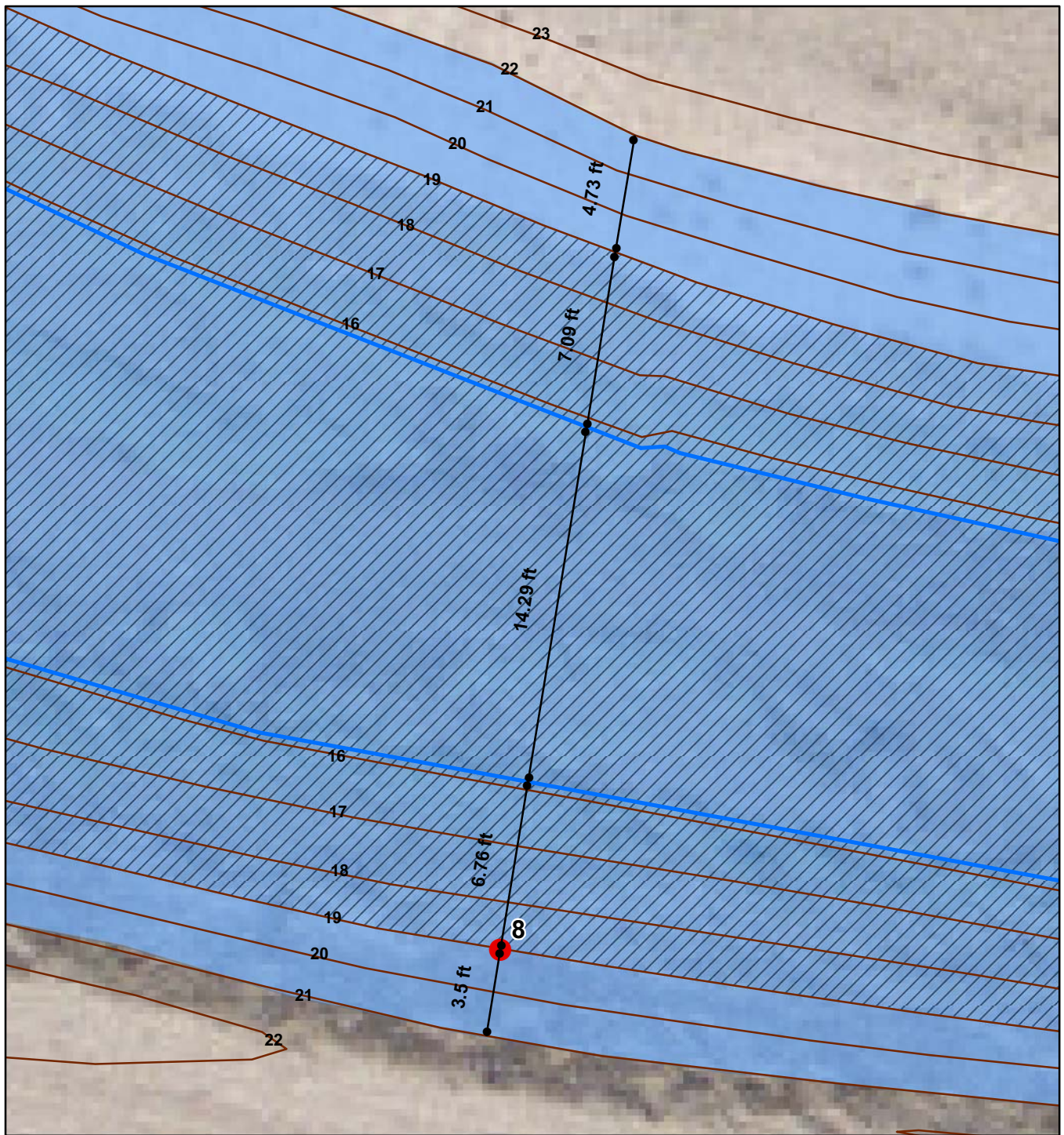


1:120

1 inch = 10 feet

Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011. Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N, North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjcnmap.org. Map date: April 21, 2011.

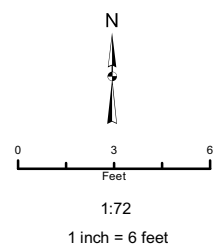
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Legend

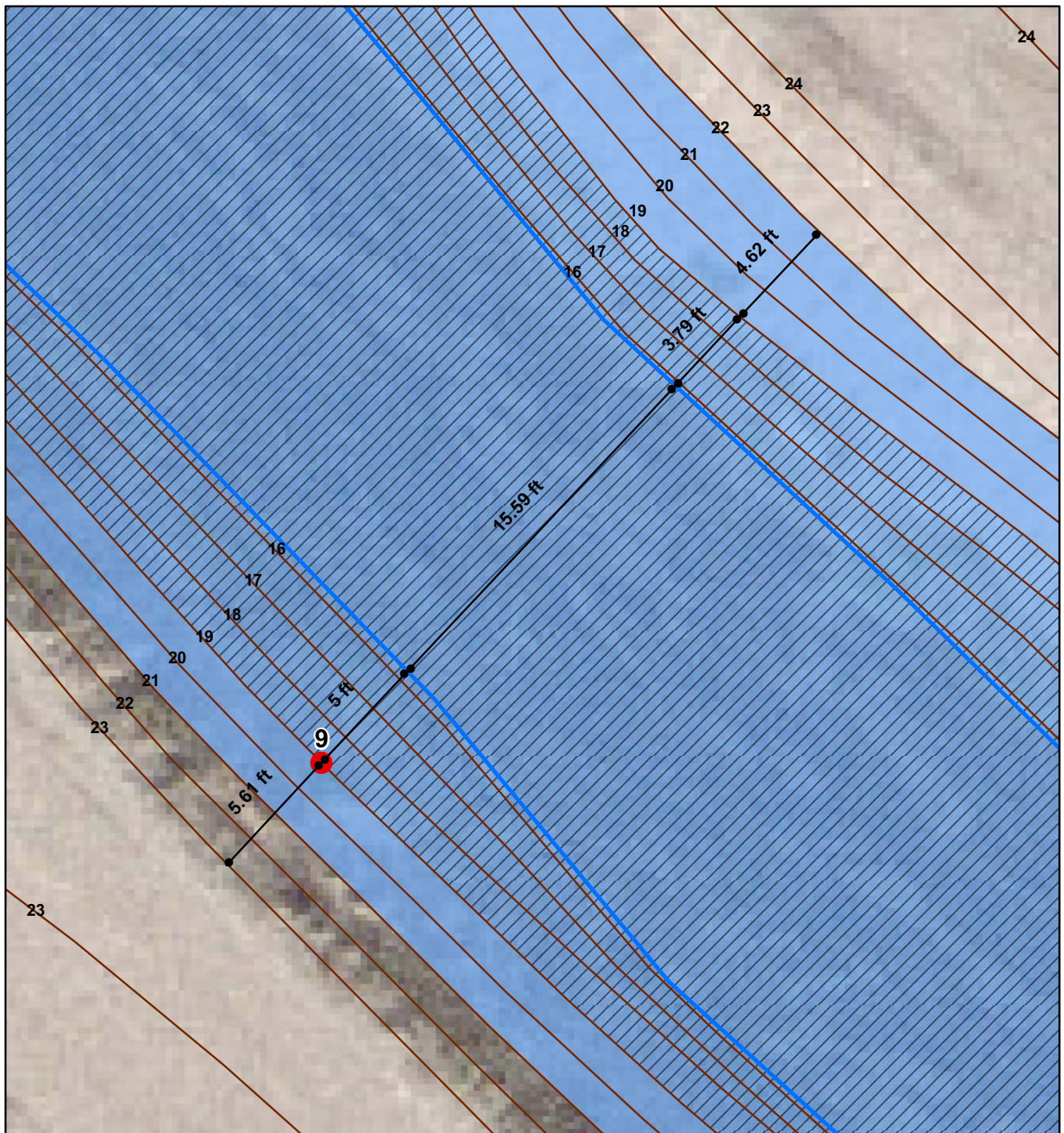
- OHHM Data Points
- Water Level
- Topo Survey
- Cross Section Lines
- /// USACE Wetlands (to OHHM)
- CDFW Wetlands (to TOB)

POINT 8 Cross-Section



Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011.
Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N,
North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjcmmap.org.
Map date: June 13, 2014.

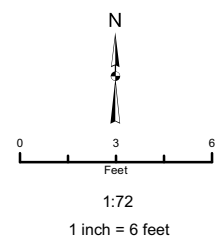
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Legend

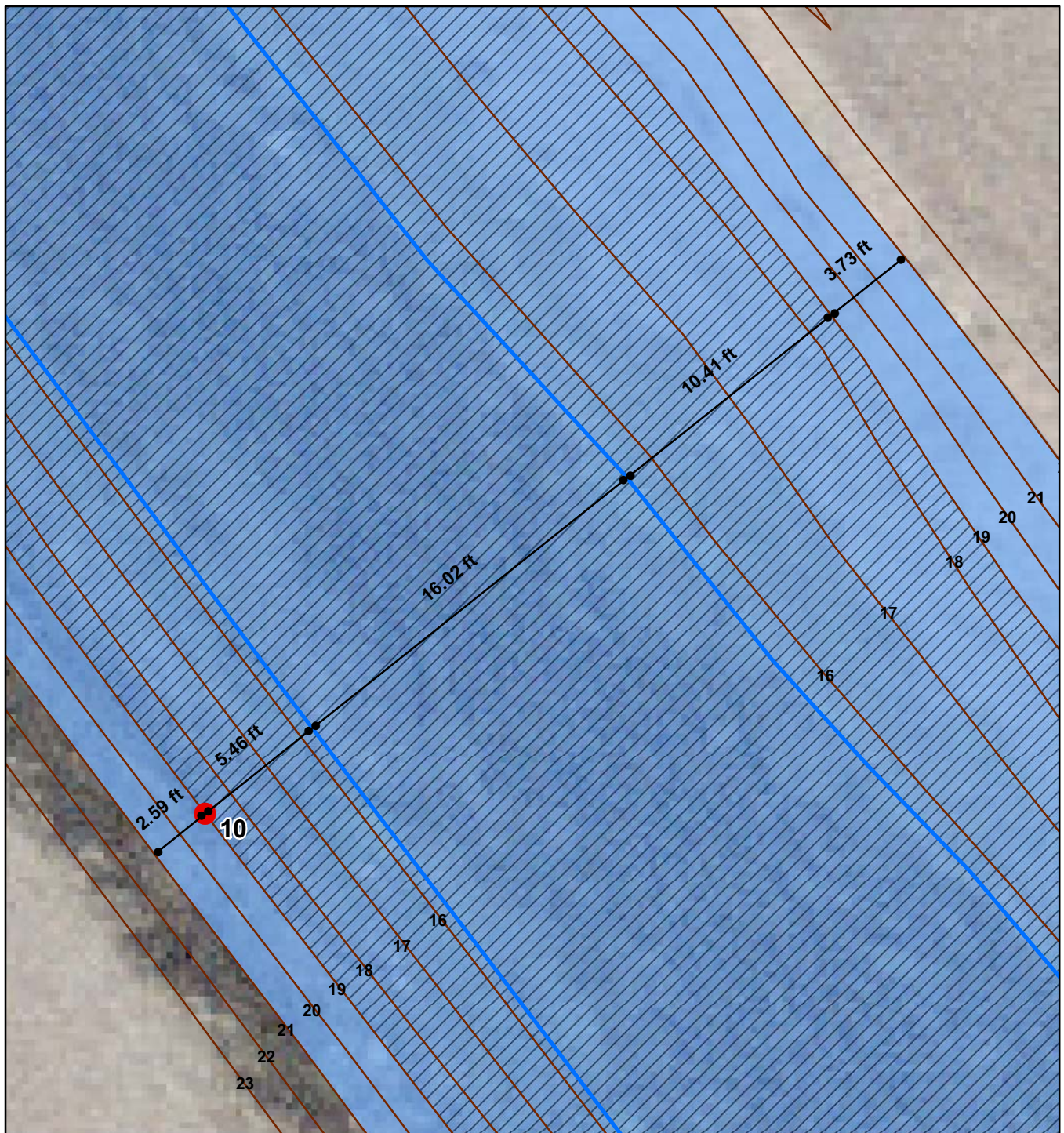
- OHWM Data Points
- Water Level
- Topo Survey
- Cross Section Lines
- /// USACE Wetlands (to OHWM)
- CDFW Wetlands (to TOB)

Point 9 Cross-Section



Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011.
Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N,
North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjcmmap.org.
Map date: June 13, 2014.

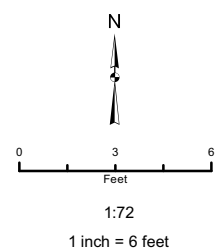
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Legend

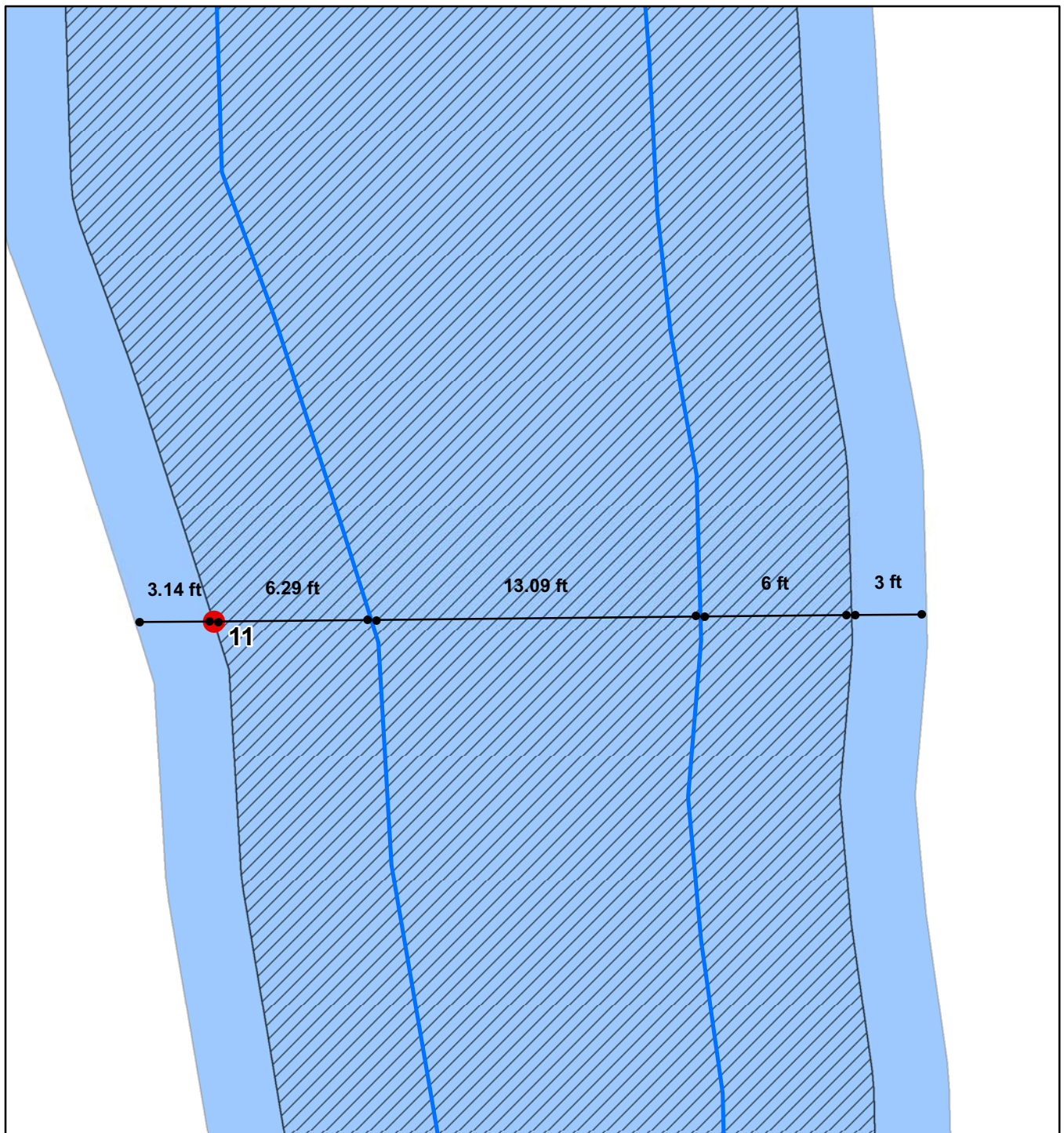
- OHHM Data Points
- Water Level
- Topo Survey
- Cross Section Lines
- /// USACE Wetlands (to OHHM)
- CDFW Wetlands (to TOB)

Point 10 Cross-Section



Data sources: Orthophotography and survey data provided by Point Co., Fair Oaks, California, 2011.
Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N,
North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjemap.org.
Map date: June 13, 2014.

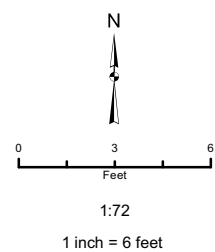
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Point 11 Cross-Section

Legend

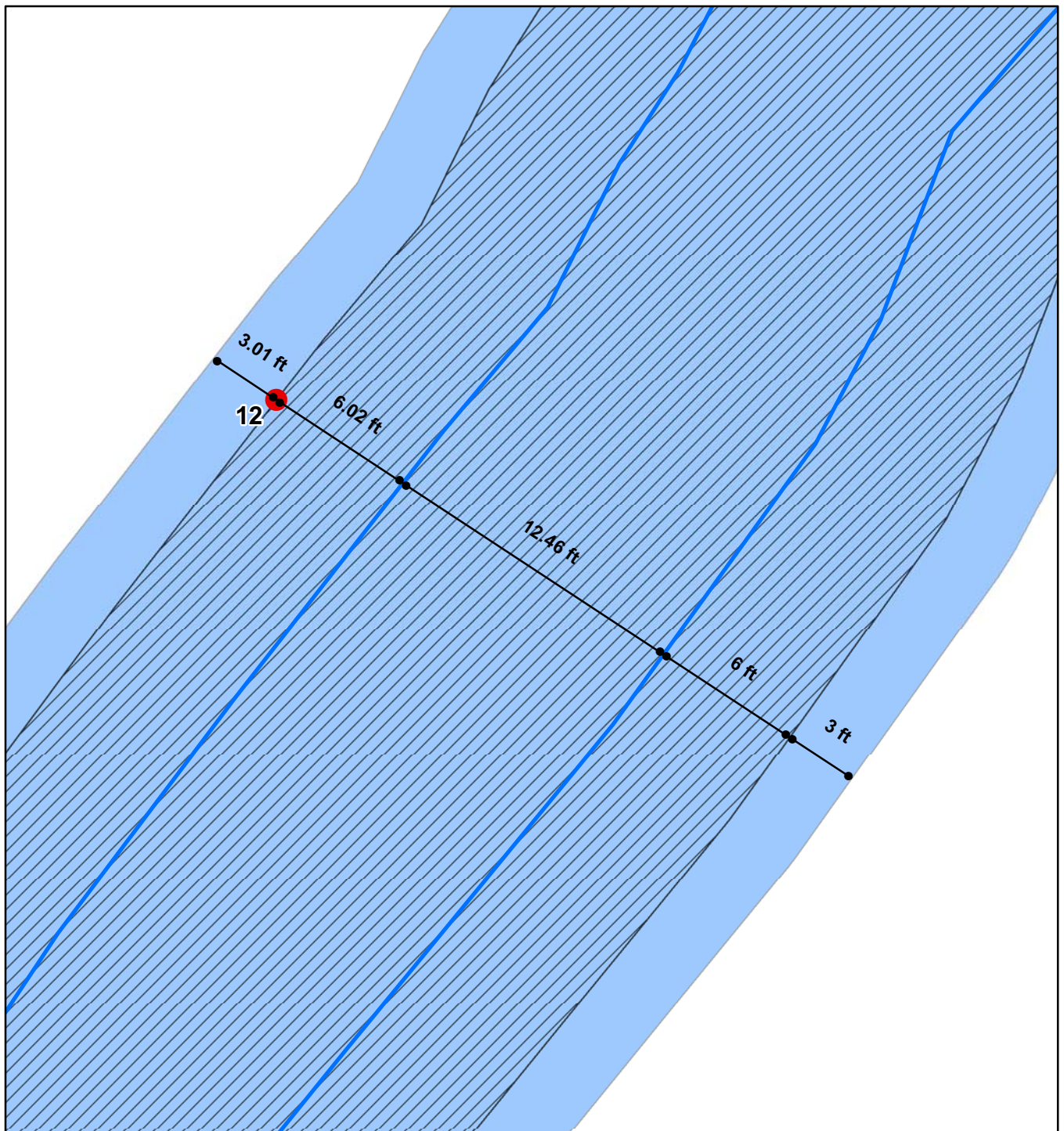
- OHWM Data Points
- Water Level
- Cross Section Lines
- USACE Wetlands (to OHWM)
- CDFW Wetlands (to TOB)



Data sources: Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N, North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjemap.org. Map date: June 13, 2014.

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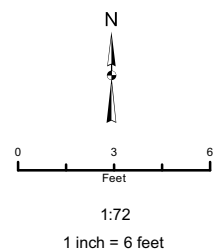




Legend

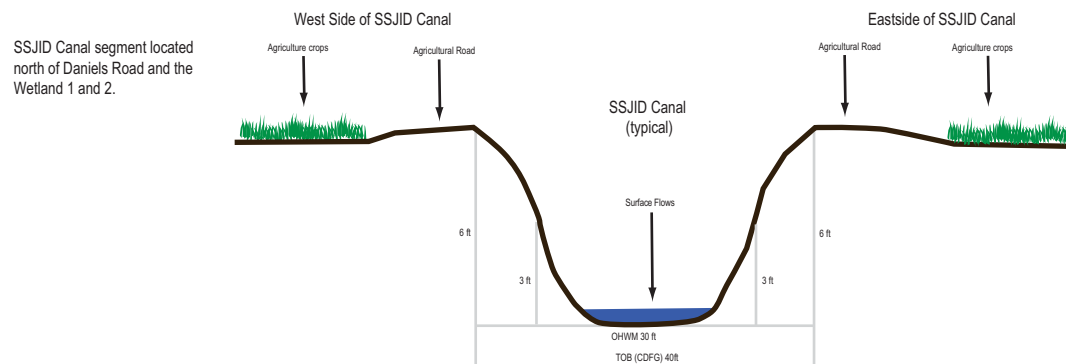
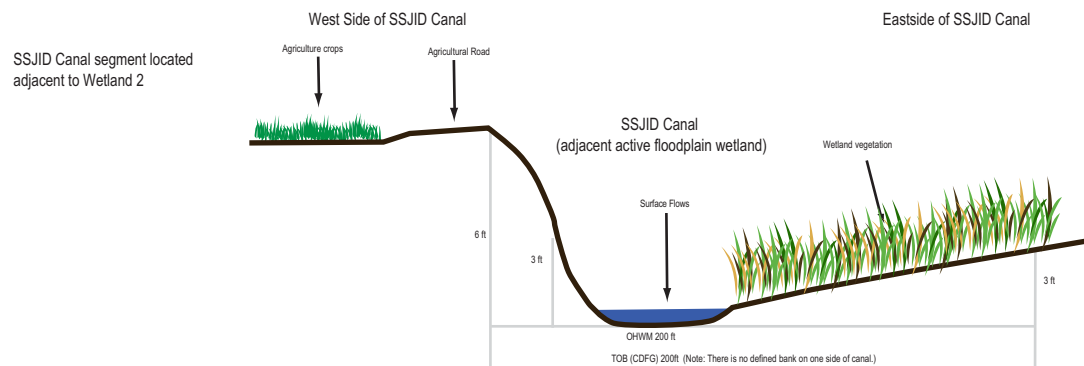
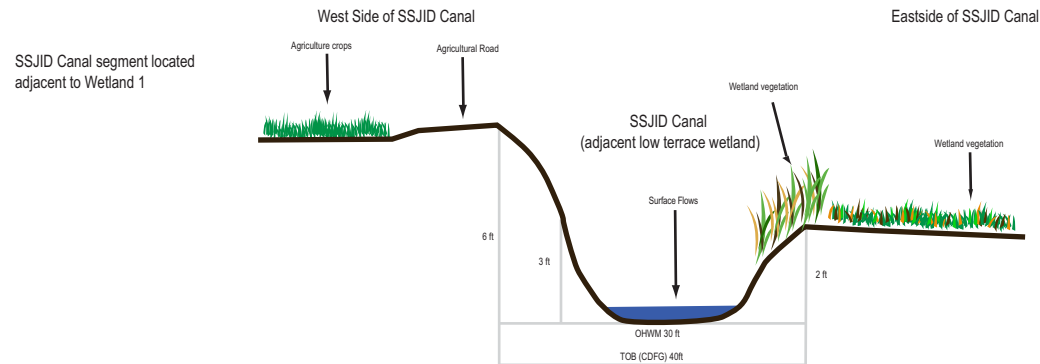
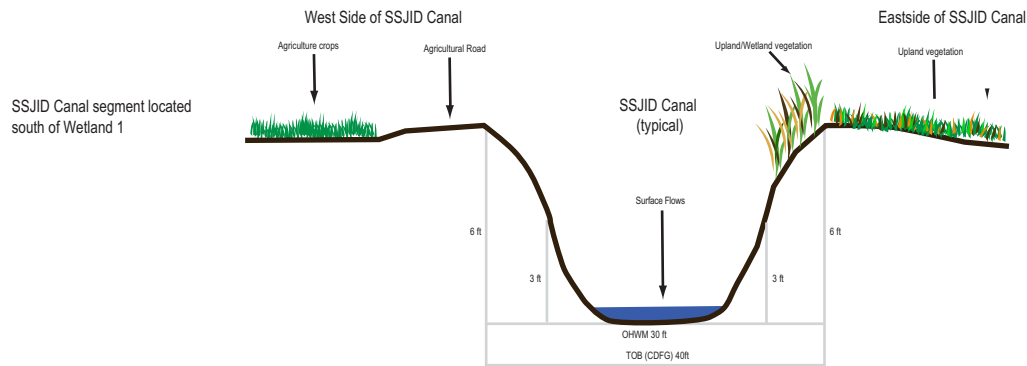
- OHWM Data Points
- Water Level
- Cross Section Lines
- USACE Wetlands (to OHWM)
- CDFW Wetlands (to TOB)

Point 12 Cross-Section



Data sources: Wetlands mapped using Trimble GeoExplorer XH 2008 GPS. Data recorded in UTM Zone 10N, North American Datum 1983. Property boundaries from San Joaquin County GIS, www.sjemap.org. Map date: June 13, 2014.

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OHWM - Ordinary High Water Mark

TOB - Top of Bank

Data Source: Field Data, 2011

Not To Scale

APPENDIX B: SITE PHOTOGRAPHS



View to the north at Data Point 1. Shows the west bank in the forefront on the left side of the photo and the east bank on the right side of the photo. Note the rip-rap with a concrete pour on the east bank.

Data Source: Field Data, 2011



View of the East Bank of SSJID Canal at Data Point 3.



View to the south at Data Point 3. Shows the west bank in the forefront on the right side of the photo and the east bank on the left side of the photo.

Data Source: Field Data, 2011



View to the south at Data Point 5. Shows the west bank in the forefront on the right side of the photo and the east bank on the left side of the photo.



View of the East Bank of SSJID Canal at Data Point 5.

Data Source: Field Data, 2011



View to the north at Data Point 5. Shows the west bank in the forefront on the left side of the photo and the east bank on the right side of the photo.

Data Source: Field Data, 2011





Wetland 1: View to the southwest at Data Point 8.



Wetland 1: View to the southeast at Data Point 8.

Data Source: Field Data, 2011



Wetland 2: View to the east from the edge of water (undefined bank).



Wetland 2: View to the west from the edge of water (undefined bank).

Data Source: Field Data, 2011



Wetland 2: View to the north from approximately 30 feet north of Data Point 10.



Wetland 2: View to the northwest from approximately 30 feet north of Data Point 10.

Data Source: Field Data, 2011

APPENDIX C: WETLAND DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 1
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>	
Wetland Hydrology Present?	Yes _____ No <u>X</u>	
Remarks: Field survey occurred one day after a significant rain event (5-day event).		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>5</u> x 3 = <u>15</u> FACU species _____ x 4 = _____ UPL species <u>95</u> x 5 = <u>475</u> Column Totals: <u>100</u> (A) <u>490</u> (B) Prevalence Index = B/A = <u>4.9</u>
Sapling/Shrub Stratum (Plot size: _____) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover				
Herb Stratum (Plot size: _____) 1. <u>Bromus diandrus</u> 80 x UPL 2. <u>Silybum marianum</u> 15 UPL 3. <u>Conium maculatum</u> 5 Fac 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ _____ = Total Cover				
Woody Vine Stratum (Plot size: _____) 1. _____ 2. _____ _____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust _____				
Remarks: Dense Bromus diandrus standing 2' tall.				Hydrophytic Vegetation Indicators: ___ Dominance Test is >50% ___ Prevalence Index is ≤3.0 ¹ ___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes _____ No <u>X</u>



SOIL

Sampling Point: ¹_____**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 4/4	100					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Sandy Redox (S5)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5) (LRR C)	☐ Depleted Matrix (F3)
☐ 1 cm Muck (A9) (LRR D)	☐ Redox Dark Surface (F6)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)
☐ Sandy Mucky Mineral (S1)	☐ Vernal Pools (F9)
☐ Sandy Gleyed Matrix (S4)	

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)	☐ Salt Crust (B11)
☐ High Water Table (A2)	☐ Biotic Crust (B12)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) (Nonriverine)	☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Drift Deposits (B3) (Nonriverine)	☐ Presence of Reduced Iron (C4)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes _____ No ☒ Depth (inches): _____Saturation Present? Yes _____ No ☒ Depth (inches): _____
(includes capillary fringe)**Wetland Hydrology Present?** Yes _____ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No presence of water approximately 24 hours after a 5-day rain event.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 2
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: Field survey occurred one day after a significant rain event (5-day event).	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>65</u> x 3 = <u>195</u> FACU species _____ x 4 = _____ UPL species <u>35</u> x 5 = <u>175</u> Column Totals: <u>100</u> (A) <u>370</u> (B) Prevalence Index = B/A = <u>3.7</u>
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				Hydrophytic Vegetation Indicators: _____ Dominance Test is >50% _____ Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain)
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <u>X</u> ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____) 1. _____ 2. _____ _____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust _____				
Remarks: Conium dominates the plot.				
_____ = Total Cover				
_____ = Total Cover				



SOIL

Sampling Point: 2**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 4/3	100					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5) (**LRR C**)
☐ 1 cm Muck (A9) (**LRR D**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)

☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils³:

☐ 1 cm Muck (A9) (**LRR C**)
☐ 2 cm Muck (A10) (**LRR B**)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1) (**Nonriverine**)
☐ Sediment Deposits (B2) (**Nonriverine**)
☐ Drift Deposits (B3) (**Nonriverine**)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)

☐ Salt Crust (B11)
☐ Biotic Crust (B12)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Thin Muck Surface (C7)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water Marks (B1) (**Riverine**)
☐ Sediment Deposits (B2) (**Riverine**)
☐ Drift Deposits (B3) (**Riverine**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)

Field Observations:Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes _____ No ☒ Depth (inches): _____Saturation Present? Yes _____ No ☒ Depth (inches): _____
(includes capillary fringe)**Wetland Hydrology Present?** Yes _____ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No presence of water approximately 24 hours after a 5-day rain event.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 3
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: Field survey occurred one day after a significant rain event (5-day event).	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>65</u> x 3 = <u>195</u> FACU species _____ x 4 = _____ UPL species <u>35</u> x 5 = <u>175</u> Column Totals: <u>100</u> (A) <u>370</u> (B) Prevalence Index = B/A = <u>3.7</u>
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				Hydrophytic Vegetation Indicators: _____ Dominance Test is >50% _____ Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain)
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <u>X</u> ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____) 1. _____ 2. _____ _____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust _____				
Remarks: Conium dominates the plot.				
_____ = Total Cover				
_____ = Total Cover				



SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 4/3	100					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5) (**LRR C**)
☐ 1 cm Muck (A9) (**LRR D**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)

☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils³:

☐ 1 cm Muck (A9) (**LRR C**)
☐ 2 cm Muck (A10) (**LRR B**)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1) (**Nonriverine**)
☐ Sediment Deposits (B2) (**Nonriverine**)
☐ Drift Deposits (B3) (**Nonriverine**)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)

☐ Salt Crust (B11)
☐ Biotic Crust (B12)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Thin Muck Surface (C7)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water Marks (B1) (**Riverine**)
☐ Sediment Deposits (B2) (**Riverine**)
☐ Drift Deposits (B3) (**Riverine**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____Water Table Present? Yes _____ No X Depth (inches): _____Saturation Present? Yes _____ No X Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No presence of water approximately 24 hours after a 5-day rain event.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/14
 Applicant/Owner: City of Manteca State: CA Sampling Point: 4
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Field survey occurred one day after a significant rain event (5-day event).	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>5</u> x 2 = <u>10</u> FAC species <u>65</u> x 3 = <u>195</u> FACU species _____ x 4 = _____ UPL species <u>30</u> x 5 = <u>150</u> Column Totals: <u>100</u> (A) <u>355</u> (B) Prevalence Index = B/A = <u>3.6</u>
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% _____ Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain)
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____ ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____) 1. _____ 2. _____ _____ = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust _____				
Remarks:				
Conium dominates the plot.				

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 3/3	100					LS	Loamy Sand
10-16	10YR 2/2	80					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Sandy Redox (S5)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5) (LRR C)	☐ Depleted Matrix (F3)
☐ 1 cm Muck (A9) (LRR D)	☐ Redox Dark Surface (F6)
☒ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)
☐ Sandy Mucky Mineral (S1)	☐ Vernal Pools (F9)
☐ Sandy Gleyed Matrix (S4)	

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)	☐ Salt Crust (B11)
☐ High Water Table (A2)	☐ Biotic Crust (B12)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) (Nonriverine)	☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Drift Deposits (B3) (Nonriverine)	☒ Presence of Reduced Iron (C4)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present? Yes ☐ No ☒ Depth (inches): _____
(includes capillary fringe)**Wetland Hydrology Present?** Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Tested positive for reduced iron. Pit didn't fill with water at 24" deep. Hydrology appears to be seasonal from overflow of irrigation water in the canal.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 5
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: Field survey occurred one day after a significant rain event (5-day event).		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>95</u> x 1 = <u>95</u> FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species <u>5</u> x 5 = <u>25</u> Column Totals: <u>100</u> (A) <u>120</u> (B) Prevalence Index = B/A = <u>1.2</u>
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u>X</u> Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size: _____)				
1. <u>Juncus acuminatus</u>	<u>95</u>	<u>x</u>	<u>OBL</u>	
2. <u>Bromus hordeaceus</u>	<u>5</u>		<u>UPL</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>	% Cover of Biotic Crust _____			

Remarks:

Thick layer of dead juncus from previous growth season included in absolute cover calculation.

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/2	100					LS	Loamy Sand
6-12	10YR 4/2	95	10YR 5/6	5	C	M	LS	Loamy Sand
12-16	10YR 2/2	100					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)	☐ Sandy Redox (S5)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5) (LRR C)	☒ Depleted Matrix (F3)
☐ 1 cm Muck (A9) (LRR D)	☒ Redox Dark Surface (F6)
☒ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)
☐ Sandy Mucky Mineral (S1)	☐ Vernal Pools (F9)
☐ Sandy Gleyed Matrix (S4)	

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR C)
- ☐ 2 cm Muck (A10) (LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Oxidized root channels associated with juncus rhizomes.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)	☐ Salt Crust (B11)
☐ High Water Table (A2)	☐ Biotic Crust (B12)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) (Nonriverine)	☒ Oxidized Rhizospheres along Living Roots (C3)
☐ Drift Deposits (B3) (Nonriverine)	☒ Presence of Reduced Iron (C4)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (Riverine)
- ☐ Sediment Deposits (B2) (Riverine)
- ☐ Drift Deposits (B3) (Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐ No ☒	Depth (inches): _____
Water Table Present?	Yes ☐ No ☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Tested positive for reduced iron. Pit didn't fill with water at 24" deep. Hydrology appears to be seasonal from overflow of irrigation water in the canal.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 6
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks:					
Field survey occurred one day after a significant rain event (5-day event).					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC:	<u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata:	<u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100%</u> (A/B)
4. _____	_____	_____	_____		
			= Total Cover		
Prevalence Index worksheet:					
Sapling/Shrub Stratum (Plot size: _____)		Total % Cover of: _____ Multiply by: _____			
1. _____	_____	_____	_____	OBL species	<u>100</u> x 1 = <u>100</u>
2. _____	_____	_____	_____	FACW species	_____ x 2 = _____
3. _____	_____	_____	_____	FAC species	_____ x 3 = _____
4. _____	_____	_____	_____	FACU species	_____ x 4 = _____
5. _____	_____	_____	_____	UPL species	_____ x 5 = _____
			= Total Cover	Column Totals:	<u>100</u> (A) <u>100</u> (B)
Herb Stratum (Plot size: _____)		Prevalence Index = B/A = <u>1.0</u>			
1. <u>Juncus acuminatus</u>	<u>100</u>	<u>x</u>	<u>OBL</u>		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
			<u>100</u> = Total Cover		
Woody Vine Stratum (Plot size: _____)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
			= Total Cover		
% Bare Ground in Herb Stratum <u>0</u>		% Cover of Biotic Crust _____			
Hydrophytic Vegetation Indicators: <u>x</u> Dominance Test is >50% <u>x</u> Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain)					
Hydrophytic Vegetation Present? Yes <u>X</u> No _____ ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.					
Remarks:					
Thick layer of dead juncus from previous growth season included in absolute cover calculation.					



SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					LS	Loamy Sand
4-8	10YR 3/3	95	10YR 5/6	5	C	M	LS	Loamy Sand
8-16	10YR 2/2	100					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)	☐ Sandy Redox (S5)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5) (LRR C)	☒ Depleted Matrix (F3)
☐ 1 cm Muck (A9) (LRR D)	☒ Redox Dark Surface (F6)
☒ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)
☐ Sandy Mucky Mineral (S1)	☐ Vernal Pools (F9)
☐ Sandy Gleyed Matrix (S4)	

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR C)
☐ 2 cm Muck (A10) (LRR B)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Oxidized root channels.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)	☐ Salt Crust (B11)
☐ High Water Table (A2)	☐ Biotic Crust (B12)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) (Nonriverine)	☒ Oxidized Rhizospheres along Living Roots (C3)
☐ Drift Deposits (B3) (Nonriverine)	☒ Presence of Reduced Iron (C4)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (Riverine)
☐ Sediment Deposits (B2) (Riverine)
☐ Drift Deposits (B3) (Riverine)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Tested positive for reduced iron. Pit didn't fill with water at 24" deep. Hydrology appears to be seasonal from overflow of irrigation water in the canal.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 7
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Field survey occurred one day after a significant rain event (5-day event).	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>100</u> x 1 = <u>100</u> FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>100</u> (B) Prevalence Index = B/A = <u>1.0</u>
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
Herb Stratum (Plot size: _____) 1. <u>Juncus acuminatus</u> <u>100</u> <u>x</u> <u>OBL</u> 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ _____ = Total Cover				Hydrophytic Vegetation Indicators: <u>x</u> Dominance Test is >50% <u>x</u> Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____) 1. _____ 2. _____ _____ = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust _____				
Remarks: Thick layer of dead juncus from previous growth season included in absolute cover calculation.				

SOIL

Sampling Point: 7**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					LS	Loamy Sand
4-8	10YR 3/3	95	10YR 5/6	5	C	M	LS	Loamy Sand
8-16	10YR 2/2	100					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5) (**LRR C**)
☐ 1 cm Muck (A9) (**LRR D**)
☒ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☒ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (**LRR C**)
☐ 2 cm Muck (A10) (**LRR B**)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Oxidized root channels.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1) (**Nonriverine**)
☐ Sediment Deposits (B2) (**Nonriverine**)
☐ Drift Deposits (B3) (**Nonriverine**)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
☐ Biotic Crust (B12)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☒ Oxidized Rhizospheres along Living Roots (C3)
☒ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Thin Muck Surface (C7)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
☐ Sediment Deposits (B2) (**Riverine**)
☐ Drift Deposits (B3) (**Riverine**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☒ FAC-Neutral Test (D5)

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____**Wetland Hydrology Present?** Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Tested positive for reduced iron. Pit didn't fill with water at 24" deep. Hydrology appears to be seasonal from overflow of irrigation water in the canal.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 8
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Field survey occurred one day after a significant rain event (5-day event).	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>100</u> x 1 = <u>100%</u> FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>100</u> (B) Prevalence Index = B/A = <u>1.0</u>
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u>X</u> Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain)
_____ = Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Juncus acuminatus</u>	<u>100</u>	<u>x</u>	<u>OBL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust _____				
Remarks: Thick layer of dead juncus from previous growth season included in absolute cover calculation.				



SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					LS	Loamy Sand
4-8	10YR 3/3	95	10YR 5/6	5	C	M	LS	Loamy Sand
8-16	10YR 2/2	100					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)	☐ Sandy Redox (S5)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5) (LRR C)	☒ Depleted Matrix (F3)
☐ 1 cm Muck (A9) (LRR D)	☒ Redox Dark Surface (F6)
☒ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)
☐ Sandy Mucky Mineral (S1)	☐ Vernal Pools (F9)
☐ Sandy Gleyed Matrix (S4)	

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR C)
- ☐ 2 cm Muck (A10) (LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Oxidized root channels.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)	☐ Salt Crust (B11)
☐ High Water Table (A2)	☐ Biotic Crust (B12)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) (Nonriverine)	☒ Oxidized Rhizospheres along Living Roots (C3)
☐ Drift Deposits (B3) (Nonriverine)	☒ Presence of Reduced Iron (C4)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (Riverine)
- ☐ Sediment Deposits (B2) (Riverine)
- ☐ Drift Deposits (B3) (Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐ No ☒	Depth (inches): _____
Water Table Present?	Yes ☐ No ☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Pit didn't fill with water at 24" deep. Hydrology appears to be seasonal from overflow of irrigation water in the canal.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 9
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: Field survey occurred one day after a significant rain event (5-day event).	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species <u>100</u> x 5 = <u>500</u> Column Totals: <u>100</u> (A) <u>500</u> (B) Prevalence Index = B/A = <u>5.0</u>
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: ___ Dominance Test is >50% ___ Prevalence Index is ≤3.0 ¹ ___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)
_____ = Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Bromus diandrus</u>	<u>100</u>	<u>x</u>	<u>UPL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust _____				
Remarks: Dense Bromus diandrus standing 2' tall.				



SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 5/3	100					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)	☐ Sandy Redox (S5)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5) (LRR C)	☐ Depleted Matrix (F3)
☐ 1 cm Muck (A9) (LRR D)	☐ Redox Dark Surface (F6)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)
☐ Sandy Mucky Mineral (S1)	☐ Vernal Pools (F9)
☐ Sandy Gleyed Matrix (S4)	

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR C)
- ☐ 2 cm Muck (A10) (LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)	☐ Salt Crust (B11)
☐ High Water Table (A2)	☐ Biotic Crust (B12)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) (Nonriverine)	☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Drift Deposits (B3) (Nonriverine)	☐ Presence of Reduced Iron (C4)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (Riverine)
- ☐ Sediment Deposits (B2) (Riverine)
- ☐ Drift Deposits (B3) (Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes _____ No ☒ Depth (inches): _____Saturation Present? Yes _____ No ☒ Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes _____ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No presence of water approximately 24 hours after a 5-day rain event.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 10
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Field survey occurred one day after a significant rain event (5-day event).	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>80</u> x 1 = <u>80</u> FACW species <u>20</u> x 2 = <u>40</u> FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>120</u> (B) Prevalence Index = B/A = <u>1.2</u>
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u>X</u> Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Herb Stratum (Plot size: _____)				
1. <u>Juncus acuminatus</u>	<u>80</u>	<u>x</u>	<u>OBL</u>	
2. <u>Rumex crispus</u>	<u>20</u>	<u>x</u>	<u>FacW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>	% Cover of Biotic Crust _____			
Remarks: Thick layer of dead juncus from previous growth season included in absolute cover calculation.				



SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	100					LS	Loamy Sand
4-10	10YR 3/3	95	10YR 5/6	5	C	M	LS	Loamy Sand
10-16	10YR 2/2	100					LS	Loamy Sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)	☐ Sandy Redox (S5)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5) (LRR C)	☒ Depleted Matrix (F3)
☐ 1 cm Muck (A9) (LRR D)	☒ Redox Dark Surface (F6)
☒ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)
☐ Sandy Mucky Mineral (S1)	☐ Vernal Pools (F9)
☐ Sandy Gleyed Matrix (S4)	

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR C)
- ☐ 2 cm Muck (A10) (LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Oxidized root channels.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)	☐ Salt Crust (B11)
☐ High Water Table (A2)	☐ Biotic Crust (B12)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) (Nonriverine)	☒ Oxidized Rhizospheres along Living Roots (C3)
☐ Drift Deposits (B3) (Nonriverine)	☒ Presence of Reduced Iron (C4)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (Riverine)
- ☐ Sediment Deposits (B2) (Riverine)
- ☐ Drift Deposits (B3) (Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present? Yes ☐ No ☒ Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Pit didn't fill with water at 24" deep. Hydrology appears to be seasonal from overflow of irrigation water in the canal.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
 Applicant/Owner: City of Manteca State: CA Sampling Point: 11
 Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
 Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Field survey occurred one day after a significant rain event (5-day event).	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100 %</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>70</u> x 1 = <u>70</u> FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>70</u> (A) <u>70</u> (B) Prevalence Index = B/A = <u>.7</u>
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u>X</u> Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain)
_____ = Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Schoenoplectus acutus</u>	<u>70</u>	<u>x</u>	<u>OBL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>30</u> % Cover of Biotic Crust _____				

Remarks:

Area is an active floodplain from the canal and is dominated by tule.



SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 2/1	90					SC	Sandy Clay
6-12	10YR 3/2	95	10YR 5/6	5	C	M	SC	Sandy Clay
12-16	10YR 3/3	100					SL	Sandy Loam

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)	☐ Sandy Redox (S5)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5) (LRR C)	☒ Depleted Matrix (F3)
☐ 1 cm Muck (A9) (LRR D)	☒ Redox Dark Surface (F6)
☒ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)
☐ Sandy Mucky Mineral (S1)	☐ Vernal Pools (F9)
☐ Sandy Gleyed Matrix (S4)	

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR C)
- ☐ 2 cm Muck (A10) (LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Oxidized root channels.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

☐ Surface Water (A1)	☐ Salt Crust (B11)
☐ High Water Table (A2)	☐ Biotic Crust (B12)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)
☐ Water Marks (B1) (Nonriverine)	☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) (Nonriverine)	☒ Oxidized Rhizospheres along Living Roots (C3)
☐ Drift Deposits (B3) (Nonriverine)	☒ Presence of Reduced Iron (C4)
☐ Surface Soil Cracks (B6)	☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)
☐ Water-Stained Leaves (B9)	☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (Riverine)
- ☐ Sediment Deposits (B2) (Riverine)
- ☐ Drift Deposits (B3) (Riverine)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present? Yes ☒ No ☐ Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Area is an active floodplain that floods during the irrigation season when canal flows are high.

Project/Site: Manteca Canal Project City/County: Manteca/San Joaquin Sampling Date: 3/28/11
Applicant/Owner: City of Manteca State: CA Sampling Point: 12
Investigator(s): Steve McMurtry Section, Township, Range: CA 21, Section 1, Township 2S, Range 6E
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): <1%
Subregion (LRR): LRRC Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Bisgani loamy coarse sand, partially drained, 0-2% slope NWI classification: Palustrine

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks:					
Field survey occurred one day after a significant rain event (5-day event).					

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ = Total Cover			
Herb Stratum (Plot size: _____)			
1. <u>Schoenoplectus acutus</u>	<u>70</u>	<u>x</u>	<u>OBL</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
_____ = Total Cover			
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
_____ = Total Cover			
% Bare Ground in Herb Stratum <u>30</u>	% Cover of Biotic Crust _____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>70</u>	x 1 = <u>70</u>
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: <u>70</u> (A)	<u>70</u> (B)

Prevalence Index = B/A = .7

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0¹

☐ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:
Area is an active floodplain from the canal and is dominated by tule.

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 2/1	90					SC	Sandy Clay
6-12	10YR 3/2	95	10YR 5/6	5	C	M	SC	Sandy Clay
12-16	10YR 3/3	100					SL	Sandy Loam

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5) (**LRR C**)
☐ 1 cm Muck (A9) (**LRR D**)
☒ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☒ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (**LRR C**)
☐ 2 cm Muck (A10) (**LRR B**)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

 Hydric Soil Present? Yes ☒ No ☐

Remarks:

Oxidized root channels.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1) (**Nonriverine**)
☐ Sediment Deposits (B2) (**Nonriverine**)
☐ Drift Deposits (B3) (**Nonriverine**)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
☐ Biotic Crust (B12)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☒ Oxidized Rhizospheres along Living Roots (C3)
☒ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Thin Muck Surface (C7)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
☐ Sediment Deposits (B2) (**Riverine**)
☐ Drift Deposits (B3) (**Riverine**)
☒ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☒ FAC-Neutral Test (D5)

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present? Yes ☒ No ☐ Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Area is an active floodplain that floods during the irrigation season when canal flows are high.

APPENDIX D: OHWM FORMS

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/29/11 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site?

Location Details:

Southern end where canal enters site; west bank.

Y ☒ / N ☐ Is the site significantly disturbed?

Projection: Lat/Long (GRS 80) **Datum:** NAD 1983

Coordinates: 37.783728347 W, -121.261350835 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

SSJID canal serves as irrigation and storm water drainage. Approximately 12 inches of surface water.

Checklist of resources (if available):

☒ Aerial photography

Dates:

☒ Topographic maps

☐ Geologic maps

☐ Vegetation maps

☒ Soils maps

☐ Rainfall/precipitation maps

☐ Existing delineation(s) for site

☐ Global positioning system (GPS)

☐ Other studies

☐ Stream gage data

Gage number:

Period of record:

☐ History of recent effective discharges

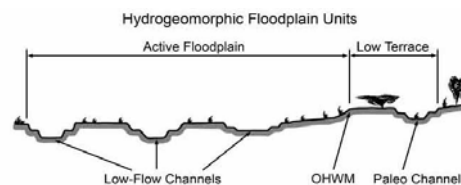
☐ Results of flood frequency analysis

☐ Most recent shift-adjusted rating

☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 1

Date: 3/29/11

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 1 _____

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☐ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Water marks
☐ Other: _____

Comments:

The OHWM is evident from water marks on the concrete bank at the southern most end of the canal.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: 1 _____

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☒ NA ☐ Mid (herbaceous, shrubs, saplings)
☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☐ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Water marks
☐ Other: _____
☐ Other: _____

Comments:

Approx. 30 meters of the canal bank is rip-rap/concrete. The bank then becomes sand with limited herbaceous plants.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park Project Number: Stream: SSJID Canal Investigator(s): Steve McMurtry	Date: 3/29/11 Town: Manteca Photo begin file#: Time: 1:00pm State: Ca Photo end file#:

Y ☒ / N ☐ Do normal circumstances exist on the site? Y ☒ / N ☐ Is the site significantly disturbed?	Location Details: Approx. 150 ft north of Datapoint 1 across road; west bank. Projection: Lat/Long (GRS 80) Datum: NAD 1983 Coordinates: 37.7841532074 W, -121.261729564 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

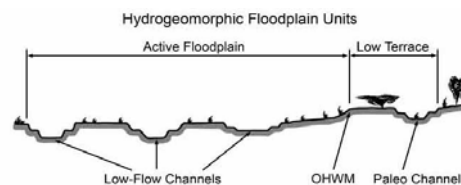
TOBs equal height; west bank largely void of veg; east bank dense veg at TOB and limited herbs at OHW.

Checklist of resources (if available):

☒ Aerial photography Dates: ☒ Topographic maps ☐ Geologic maps ☐ Vegetation maps ☒ Soils maps ☐ Rainfall/precipitation maps ☐ Existing delineation(s) for site ☐ Global positioning system (GPS) ☐ Other studies	☐ Stream gage data Gage number: Period of record: ☐ History of recent effective discharges ☐ Results of flood frequency analysis ☐ Most recent shift-adjusted rating ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHW and record the indicators. Record the OHW position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 2

Date: 3/29/11

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 2 _____

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other: _____

Comments:

The OHWM is evident from changes in vegetation cover and slight erosion of sand.

Floodplain unit:

☒ Low-Flow Channel

☐ Active Floodplain

☐ Low Terrace

GPS point: 2 _____

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 10 %

Community successional stage:

- ☐ NA
☒ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other: _____
☐ Other: _____

Comments:

The OHWM is evident on both banks from slight erosion of coarse sandy loam. There is limited herbs at this elevation.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/29/11 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:

North of bend in canal and Datapoint 2; west bank.

Projection: Lat/Long (GRS 80) **Datum:** NAD 1983

Coordinates: 37.7847070011 W, -121.262142661 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

TOB is 2 ft higher on west bank. West bank largely void of veg; east bank dense veg at TOB and limited herbs at OHW.

Checklist of resources (if available):

☒ Aerial photography

Dates:

☒ Topographic maps

☐ Geologic maps

☐ Vegetation maps

☒ Soils maps

☐ Rainfall/precipitation maps

☐ Existing delineation(s) for site

☐ Global positioning system (GPS)

☐ Other studies

☐ Stream gage data

Gage number:

Period of record:

☐ History of recent effective discharges

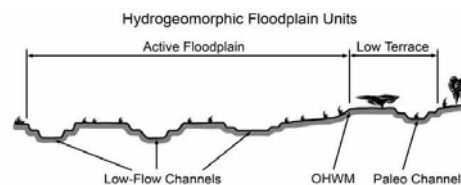
☐ Results of flood frequency analysis

☐ Most recent shift-adjusted rating

☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHW and record the indicators. Record the OHW position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 3

Date: 3/29/11

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 3

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other:

Comments:

The OHWM is evident from changes in vegetation cover and slight erosion of sand.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: 3

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 30 %

Community successional stage:

- ☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other:
☐ Other:

Comments:

The OHWM is evident on both banks from slight erosion of coarse sandy loam. There is limited herbs at this elevation.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/29/11 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:

Approx. 150 ft north of Datapoint 3; west bank.

Projection: Lat/Long (GRS 80) **Datum:** NAD 1983

Coordinates: 37.7851213375 W, -121.262166336 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

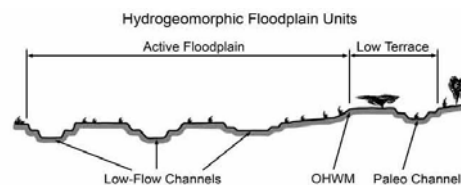
TOB is 3-4 ft higher on west bank. West bank largely void of veg; east bank has tules extending out into the canal.

Checklist of resources (if available):

☒ Aerial photography Dates: ☒ Topographic maps ☐ Geologic maps ☐ Vegetation maps ☒ Soils maps ☐ Rainfall/precipitation maps ☐ Existing delineation(s) for site ☐ Global positioning system (GPS) ☐ Other studies	☐ Stream gage data Gage number: Period of record: ☐ History of recent effective discharges ☐ Results of flood frequency analysis ☐ Most recent shift-adjusted rating ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 4

Date: 3/29/11

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 4 _____

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other: _____

Comments:

The TOB on the east bank is lower and appears to allow high water to flow into adjacent wetland.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: 4 _____

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 55 %

Community successional stage:

- ☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other: _____
☐ Other: _____

Comments:

West bank: limited herbs/slight erosion; East bank: dense tules, lower TOB allows high water to flow into adjacent wetland.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/29/11 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:

Approx. 150 ft north of Datapoint 4; west bank.

Projection: Lat/Long (GRS 80) **Datum:** NAD 1983

Coordinates: 37.7855095126 W, -121.262191069 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

TOB is 2 ft higher on west bank. West bank largely void of veg; east bank dense veg at TOB and limited herbs at OHW.

Checklist of resources (if available):

☒ Aerial photography

Dates:

☒ Topographic maps

☐ Geologic maps

☐ Vegetation maps

☒ Soils maps

☐ Rainfall/precipitation maps

☐ Existing delineation(s) for site

☐ Global positioning system (GPS)

☐ Other studies

☐ Stream gage data

Gage number:

Period of record:

☐ History of recent effective discharges

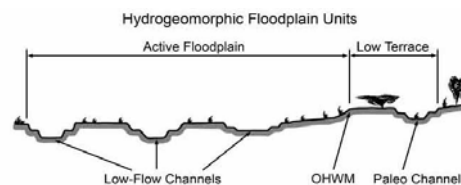
☐ Results of flood frequency analysis

☐ Most recent shift-adjusted rating

☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHW and record the indicators. Record the OHW position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 5

Date: 3/29/11

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 5 _____

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other: _____

Comments:

The OHWM is evident from changes in vegetation cover and slight erosion of sand.

Floodplain unit:

☒ Low-Flow Channel

☐ Active Floodplain

☐ Low Terrace

GPS point: 5 _____

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 30 %

Community successional stage:

- ☐ NA
☒ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other: _____
☐ Other: _____

Comments:

The OHWM is evident on both banks from slight erosion of coarse sandy loam. There is limited herbs at this elevation.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/29/11 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site? **Location Details:** Northern; approx. 150 ft north of Data point 5; west bank.
 Y ☒ / N ☐ Is the site significantly disturbed? **Projection:** Lat/Long (GRS 80) **Datum:** NAD 1983
Coordinates: 37.7858881594 W, -121.262219951 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

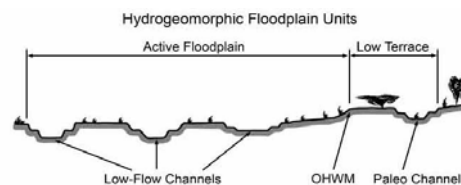
TOB is 3-4 ft higher on west bank. West bank largely void of veg; east bank has tules extending out into the canal.

Checklist of resources (if available):

☒ Aerial photography Dates: ☒ Topographic maps ☐ Geologic maps ☐ Vegetation maps ☒ Soils maps ☐ Rainfall/precipitation maps ☐ Existing delineation(s) for site ☐ Global positioning system (GPS) ☐ Other studies	☐ Stream gage data Gage number: Period of record: ☐ History of recent effective discharges ☐ Results of flood frequency analysis ☐ Most recent shift-adjusted rating ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

- Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
- Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
- Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - Record the floodplain unit and GPS position.
 - Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - Identify any indicators present at the location.
- Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
- Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 6

Date: 3/29/11

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 6

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other:

Comments:

The TOB on the east bank is gradually getting lower from Datapoint 5.

Floodplain unit:

☒ Low-Flow Channel

☐ Active Floodplain

☐ Low Terrace

GPS point: 6

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 55 %

Community successional stage:

- ☐ NA
☒ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other:
☐ Other:

Comments:

West bank: limited herbs/slight erosion; East bank: dense tules, lower TOB allows high water to flow into adjacent wetland.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/29/11 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site? **Location Details:**
 200ft north of Datapoint 6, west of bend; south bank.
 Y ☒ / N ☐ Is the site significantly disturbed? **Projection:** Lat/Long (GRS 80) **Datum:** NAD 1983
Coordinates: 37.7864066761 W, -121.262481047 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

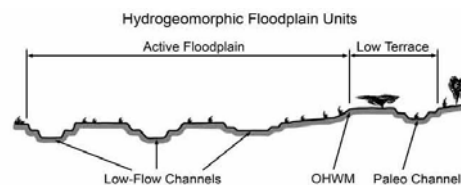
TOBs equal height; south/north bank largely void of veg; limited herbs at OHW.

Checklist of resources (if available):

☒ Aerial photography Dates: ☒ Topographic maps ☐ Geologic maps ☐ Vegetation maps ☒ Soils maps ☐ Rainfall/precipitation maps ☐ Existing delineation(s) for site ☐ Global positioning system (GPS) ☐ Other studies	☐ Stream gage data Gage number: Period of record: ☐ History of recent effective discharges ☐ Results of flood frequency analysis ☐ Most recent shift-adjusted rating ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW:

- Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
- Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
- Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - Record the floodplain unit and GPS position.
 - Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - Identify any indicators present at the location.
- Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
- Identify the OHW and record the indicators. Record the OHW position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 7

Date: 3/29/11

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 7

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other:

Comments:

The OHWM is evident from changes in vegetation cover and slight erosion of sand.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: 7

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 10 %

Community successional stage:

- ☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other:
☐ Other:

Comments:

The OHWM is evident on both banks from slight erosion of coarse sandy loam. There is limited herbs at this elevation.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/20/14 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:

375ft west of Datapoint 7, south of bend; south bank.

Projection: Lat/Long (GRS 80) **Datum:** NAD 1983

Coordinates: 37.78643920720 W, -121.26399055000 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

TOBs equal height; south/north bank largely void of veg; limited herbs at OHW.

Checklist of resources (if available):

☒ Aerial photography

Dates:

☒ Topographic maps

☐ Geologic maps

☐ Vegetation maps

☒ Soils maps

☐ Rainfall/precipitation maps

☐ Existing delineation(s) for site

☐ Global positioning system (GPS)

☐ Other studies

☐ Stream gage data

Gage number:

Period of record:

☐ History of recent effective discharges

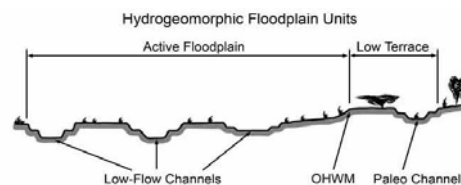
☐ Results of flood frequency analysis

☐ Most recent shift-adjusted rating

☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	Mud
		Clay	



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHW and record the indicators. Record the OHW position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 8

Date: 3/20/14

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 8 _____

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other: _____

Comments:

The OHWM is evident from changes in vegetation cover and slight erosion of sand.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: 8 _____

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 10 %

Community successional stage:

- ☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other: _____
☐ Other: _____

Comments:

The OHWM is evident on both banks from slight erosion of coarse sandy loam. There is limited herbs at this elevation.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/20/14 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:

325ft northwest of Datapoint 8; south bank.

Projection: Lat/Long (GRS 80) **Datum:** NAD 1983

Coordinates: 37.78708563540 W, -121.26498279200 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

TOBs equal height; south/north bank largely void of veg; limited herbs at OHW.

Checklist of resources (if available):

☒ Aerial photography

Dates:

☒ Topographic maps

☐ Geologic maps

☐ Vegetation maps

☒ Soils maps

☐ Rainfall/precipitation maps

☐ Existing delineation(s) for site

☐ Global positioning system (GPS)

☐ Other studies

☐ Stream gage data

Gage number:

Period of record:

☐ History of recent effective discharges

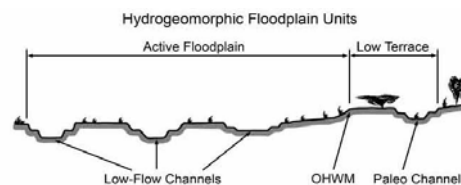
☐ Results of flood frequency analysis

☐ Most recent shift-adjusted rating

☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHW and record the indicators. Record the OHW position via:

☐ Mapping on aerial photograph
☐ Digitized on computer

☐ GPS
☐ Other:

Project ID:

Cross section ID: 9

Date: 3/20/14

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 9

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other:

Comments:

The OHWM is evident from changes in vegetation cover and slight erosion of sand.

Floodplain unit:

☒ Low-Flow Channel

☐ Active Floodplain

☐ Low Terrace

GPS point: 9

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 10 %

Community successional stage:

- ☐ NA
☒ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other:
☐ Other:

Comments:

The OHWM is evident on both banks from slight erosion of coarse sandy loam. There is limited herbs at this elevation.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/20/14 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:

1,000ft south of Datapoint 11; south bank.

Projection: Lat/Long (GRS 80) **Datum:** NAD 1983

Coordinates: 37.78859290450 W, -121.26673967200 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

TOBs equal height; south/north bank largely void of veg; limited herbs at OHW.

Checklist of resources (if available):

☒ Aerial photography

Dates:

☒ Topographic maps

☐ Geologic maps

☐ Vegetation maps

☒ Soils maps

☐ Rainfall/precipitation maps

☐ Existing delineation(s) for site

☐ Global positioning system (GPS)

☐ Other studies

☐ Stream gage data

Gage number:

Period of record:

☐ History of recent effective discharges

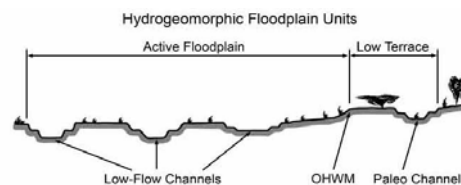
☐ Results of flood frequency analysis

☐ Most recent shift-adjusted rating

☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHW and record the indicators. Record the OHW position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 10

Date: 3/20/14

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 10 _____

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other: _____

Comments:

The OHWM is evident from changes in vegetation cover and slight erosion of sand.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: 10 _____

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 10 %

Community successional stage:

- ☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other: _____
☐ Other: _____

Comments:

The OHWM is evident on both banks from slight erosion of coarse sandy loam. There is limited herbs at this elevation.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/20/14 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:

1,000ft north of Datapoint 10; south bank.

Projection: Lat/Long (GRS 80) **Datum:** NAD 1983

Coordinates: 37.79131778650 W, -121.26771350700 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

TOBs equal height; south/north bank largely void of veg; limited herbs at OHW.

Checklist of resources (if available):

☒ Aerial photography

Dates:

☒ Topographic maps

☐ Geologic maps

☐ Vegetation maps

☒ Soils maps

☐ Rainfall/precipitation maps

☐ Existing delineation(s) for site

☐ Global positioning system (GPS)

☐ Other studies

☐ Stream gage data

Gage number:

Period of record:

☐ History of recent effective discharges

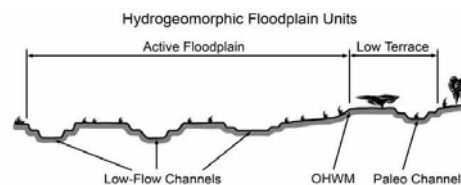
☐ Results of flood frequency analysis

☐ Most recent shift-adjusted rating

☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	Mud
		Clay	



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHW and record the indicators. Record the OHW position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 11

Date: 3/20/14

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 11 _____

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other: _____

Comments:

The OHWM is evident from changes in vegetation cover and slight erosion of sand.

Floodplain unit:

☒ Low-Flow Channel

☐ Active Floodplain

☐ Low Terrace

GPS point: 11 _____

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 10 %

Community successional stage:

- ☐ NA
☒ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other: _____
☐ Other: _____

Comments:

The OHWM is evident on both banks from slight erosion of coarse sandy loam. There is limited herbs at this elevation.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: French Camp Outlet Canal Improvements/Water Park **Date:** 3/20/14 **Time:** 1:00pm
Project Number: **Town:** Manteca **State:** Ca
Stream: SSJID Canal **Photo begin file#:** **Photo end file#:**
Investigator(s): Steve McMurtry

Y ☒ / N ☐ Do normal circumstances exist on the site?

Location Details:

800ft northeast of Datapoint 11; south bank.

Y ☒ / N ☐ Is the site significantly disturbed?

Projection: Lat/Long (GRS 80) **Datum:** NAD 1983

Coordinates: 37.79338286310 W, -121.26663288900 N

Potential anthropogenic influences on the channel system:

The SSJID canal is an anthropogenically created network of irrigation canals.

Brief site description:

TOBs equal height; south/north bank largely void of veg; limited herbs at OHW.

Checklist of resources (if available):

☒ Aerial photography

Dates:

☒ Topographic maps

☐ Geologic maps

☐ Vegetation maps

☒ Soils maps

☐ Rainfall/precipitation maps

☐ Existing delineation(s) for site

☐ Global positioning system (GPS)

☐ Other studies

☐ Stream gage data

Gage number:

Period of record:

☐ History of recent effective discharges

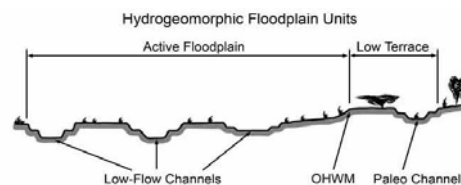
☐ Results of flood frequency analysis

☐ Most recent shift-adjusted rating

☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Wentworth Size Classes

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
 - a) Record the floodplain unit and GPS position.
 - b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
 - c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHW and record the indicators. Record the OHW position via:

☐ Mapping on aerial photograph	☐ GPS
☐ Digitized on computer	☐ Other:

Project ID:

Cross section ID: 12

Date: 3/20/14

Time: 1:00pm

Cross section drawing:

OHWM

GPS point: 12

Indicators:

- ☐ Change in average sediment texture
☐ Change in vegetation species
☒ Change in vegetation cover

- ☐ Break in bank slope
☒ Other: Erosion of sand
☐ Other:

Comments:

The OHWM is evident from changes in vegetation cover and slight erosion of sand.

Floodplain unit:

☒ Low-Flow Channel

☐ Active Floodplain

☐ Low Terrace

GPS point: 12

Characteristics of the floodplain unit:

Average sediment texture: loamy coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 10 %

Community successional stage:

- ☐ NA
☒ Early (herbaceous & seedlings)
☐ Mid (herbaceous, shrubs, saplings)
☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
☐ Ripples
☐ Drift and/or debris
☒ Presence of bed and bank
☐ Benches

- ☐ Soil development
☐ Surface relief
☒ Other: Erosion of sand
☐ Other:
☐ Other:

Comments:

The OHWM is evident on both banks from slight erosion of coarse sandy loam. There is limited herbs at this elevation.

APPENDIX E: JURISDICTIONAL DETERMINATION FORM



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

February 20, 2015

Regulatory Division SPK-2014-01036

City of Manteca
Attn: Mr. Don Smail
1001 W. Center Street
Manteca, California 95337

Dear Mr. Smail:

We are responding to your October 29, 2014 request for a preliminary jurisdictional determination (JD), in accordance with our Regulatory Guidance Letter (RGL) 08-02, for the French Camp Outlet Canal Improvements site. The approximately **210.7-acre** site is located near French Camp Outlet Canal, Section 1, Township 2 South, Range 6 East, Mount Diablo Meridian, Latitude 37.7853°, Longitude -121.26°, Manteca, San Joaquin County, California.

Based on available information, **we concur with the amount and location of wetlands and other water bodies on the site as depicted on the enclosed November 14, 2014, USACE Jurisdictional Map prepared by DeNovo Planning Group.** The approximately **2.44 acres** of wetlands and **2.98-acres** of other waters, totaling **5.42-acres** present within the survey area are potential waters of the United States regulated under Section 404 of the Clean Water Act.

We have enclosed a copy of the *Preliminary Jurisdictional Determination Form* for this site. Please sign and return a copy of the completed form to this office. Once we receive a copy of the form with your signature we can accept and process a Pre-Construction Notification or permit application for your proposed project.

You should not start any work in potentially jurisdictional waters of the United States unless you have Department of the Army permit authorization for the activity. You may request an approved JD for this site at any time prior to starting work within waters. In certain circumstances, as described in RGL 08-02, an approved JD may later be necessary.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This preliminary determination has been conducted to identify the potential limits of wetlands and other water bodies which may be subject to Corps of Engineers' jurisdiction for the particular site identified in this request. A Notification of Appeal Process and Request for Appeal form is enclosed to notify you of your options with this determination. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2014-01036 in any correspondence concerning this project. If you have any questions, please contact Ramon Aberasturi at California South Branch, by email at Ramon.Aberasturi@usace.army.mil, or telephone at 916-557-6865. For more information regarding our program, please visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,



Kathleen A. Dadey
Chief, California South Branch

Enclosures

cc: (with delineation map)

Dr. Jeffrey R. Single, Regional Manager, California Department of Fish and Wildlife,
Central Region (R4), 1234 E. Shaw Avenue, Fresno, California 93710-7802
reg4sec@wildlife.ca.gov

Matt Scroggins, California Regional Water Quality Control Board, 1685 E Street,
Fresno, California 93706-2020 Matt.Scroggins@waterboards.ca.gov

Thomas Leeman, San Joaquin Valley Branch, Endangered Species Division, U.S. Fish
and Wildlife Service, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-
3901 (thomas_leeman@fws.gov)

Mr. Jason Brush, Wetland Section Chief (W-8), United States Environmental Protection
Agency, 75 Hawthorne Street, San Francisco, California 94105
(Brush.Jason@epa.gov)

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

Sacramento District

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Regulatory Branch: **California South** File/ORM #: **SPK-2014-01036**

PJD Date: **February 20, 2015**

State: **CA** City/County: **Manteca, San Joaquin County**
Nearest Waterbody: **French Camp Outlet Canal**

Location (Lat/Long): **37.7853°, -121.26°**

Size of Review Area: **210.7** acres

Name/Address **City of Manteca**
Of Property **Attn: Karen L. McLaughlin**
Owner/ **1001 W. Center Street**
Potential **Manteca, California 95337**
Applicant

Identify (Estimate) Amount of Waters in the Review Area

Non-Wetland Waters:

linear feet ft wide **2.98** acre(s)

Stream Flow: **Intermittent**

Wetlands: 2.44 acre(s)

Cowardin Class: **Palustrine, emergent**

Name of any Water Bodies Tidal:
on the site identified as
Section 10 Waters: Non-Tidal:

☒ Office (Desk) Determination
☐ Field Determination:
Date(s) of Site Visit(s):

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply – checked items should be included in case file and, where checked and requested, appropriately reference sources below)

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **French Camp Outlet Canal Improvements and Manteca Family Center, De Novo Planning Group, 10/29/2014 as ammended.**
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
- ☐ Data sheets prepared by the Corps.
- ☐ Corps navigable waters' study.
- ☒ U.S. Geological Survey Hydrologic Atlas:
☒ USGS NHD data.
☐ USGS HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: **1:24K; CA-LATHROP**
- ☒ USDA Natural Resources Conservation Service Soil Survey.
- ☐ National wetlands inventory map(s).
- ☐ State/Local wetland inventory map(s).
- ☐ FEMA/FIRM maps.
- ☐ 100-year Floodplain Elevation (if known):
- ☒ Photographs: ☒ Aerial
☐ Other
- ☐ Previous determination(s). File no. and date of response letter:
- ☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager
(REQUIRED)

Signature and Date of Person Requesting Preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

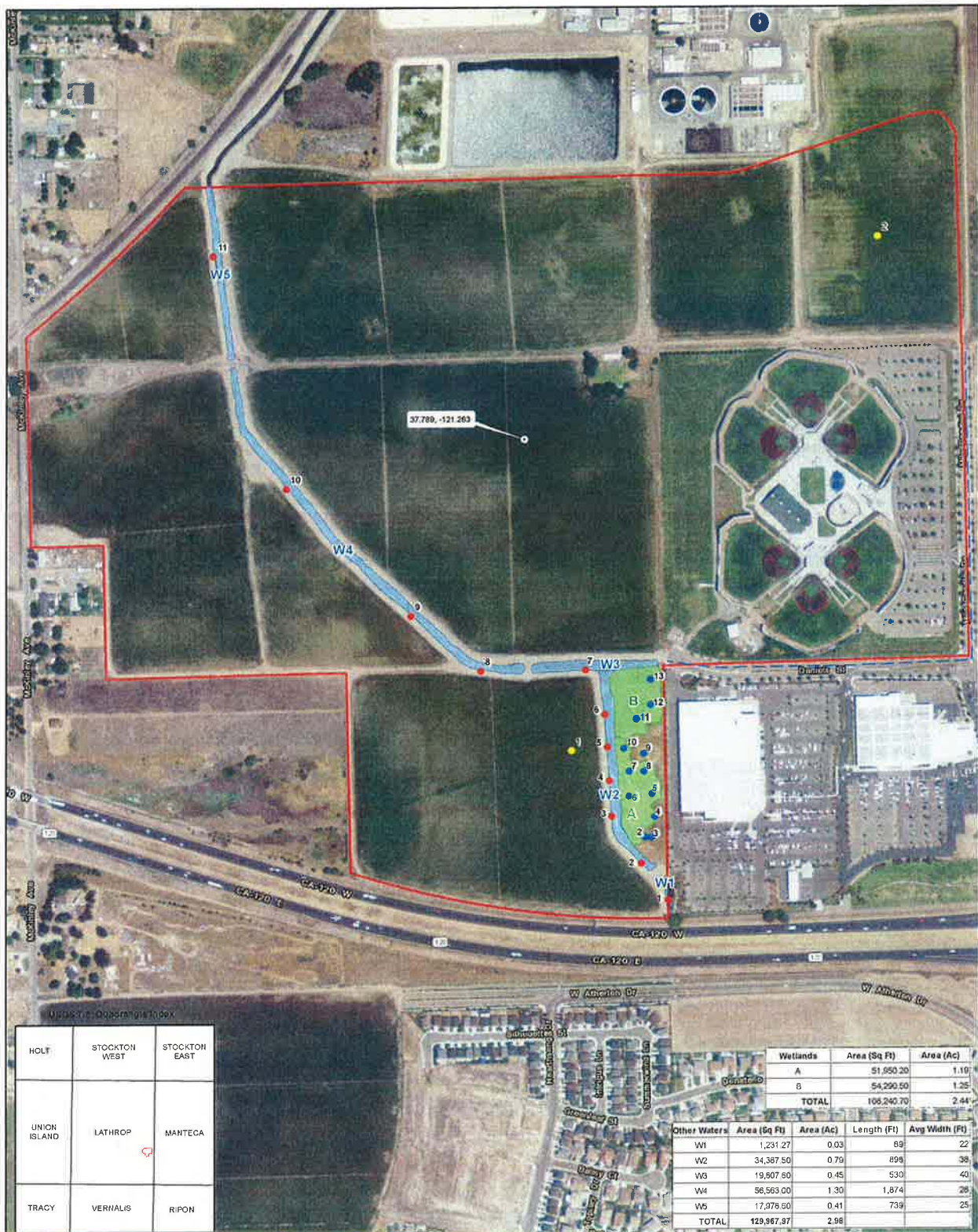


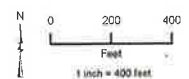
Figure 2-7: USACE Jurisdictional Map

Lathrop Quadrangle

T2S, R6E, sec1

UTM 10N: 4183835.9N, 652920.29E

GCS NAD83: 37.79N, 121.26W



CULTURAL REPORT

Confidential and Sensitive Information: Not for Public Review

TRAFFIC DATA

Appendix H

Technical Calculations

Existing Conditions Technical Calculations

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Existing Conditions
AM Peak Hour

Intersection 1

Airport Way/Atherton Drive

Side Street Stop

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	1	1	80.0%	5.1	4.8	A
	Through	98	95	97.3%	1.7	0.3	A
	Right Turn	1	1	90.0%	1.9	2.0	A
	Subtotal	100	97	97.1%	1.8	0.3	A
SB	Left Turn	14	15	107.9%	4.2	0.6	A
	Through	45	47	103.3%	1.6	0.3	A
	Right Turn	30	33	108.3%	1.6	0.4	A
	Subtotal	89	94	105.7%	2.0	0.3	A
EB	Left Turn	62	66	106.3%	57.3	24.8	F
	Through						
	Right Turn	2	1	60.0%	1.5	1.3	A
	Subtotal	64	67	104.8%	56.3	24.5	F
WB	Left Turn	2	2	95.0%	17.9	12.1	C
	Through						
	Right Turn	30	30	100.7%	15.0	4.7	B
	Subtotal	32	32	100.3%	15.4	4.9	C
Total		285	290	101.9%	16.0	6.2	C

Intersection 2

Airport Way/SR 120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	41	41	99.8%	28.6	3.8	C
	Through	153	150	98.2%	10.6	1.4	B
	Right Turn						
	Subtotal	194	191	98.6%	14.4	1.5	B
SB	Left Turn						
	Through	78	84	107.9%	11.7	2.1	B
	Right Turn	88	86	98.0%	5.9	1.2	A
	Subtotal	166	170	102.7%	8.7	1.2	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	23	24	104.3%	22.8	2.5	C
	Through						
	Right Turn	58	58	99.5%	13.6	1.5	B
	Subtotal	81	82	100.9%	16.4	1.1	B
Total		441	443	100.5%	12.6	1.0	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Existing Conditions
AM Peak Hour

Intersection 3

Airport Way/SR 120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	138	137	99.1%	15.1	2.5	B
	Right Turn	52	54	104.0%	6.4	1.0	A
	Subtotal	190	191	100.5%	12.7	2.2	B
SB	Left Turn	29	29	100.3%	30.1	6.1	C
	Through	72	75	104.4%	8.3	1.7	A
	Right Turn						
	Subtotal	101	104	103.3%	14.4	1.9	B
EB	Left Turn	56	54	96.4%	25.4	2.2	C
	Through	1	0	20.0%	1.1	3.1	A
	Right Turn	18	18	98.9%	7.0	1.4	A
	Subtotal	75	72	96.0%	20.9	1.5	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		366	367	100.3%	14.7	1.6	B

Intersection 4

Airport Way/Daniels Street

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	44	41	93.2%	39.4	3.6	D
	Through	118	119	101.0%	14.0	2.4	B
	Right Turn	49	48	98.6%	9.8	2.8	A
	Subtotal	211	209	98.8%	18.0	2.4	B
SB	Left Turn	5	5	104.0%	45.3	19.3	D
	Through	77	82	106.1%	20.1	4.2	C
	Right Turn	20	18	90.5%	4.5	1.1	A
	Subtotal	102	105	102.9%	18.7	3.7	B
EB	Left Turn	12	10	85.8%	39.1	13.4	D
	Through	6	6	93.3%	44.3	8.8	D
	Right Turn	34	33	97.9%	9.5	1.0	A
	Subtotal	52	49	94.6%	19.9	3.7	B
WB	Left Turn	55	50	91.3%	41.8	5.9	D
	Through	11	11	103.6%	34.9	9.5	C
	Right Turn	6	7	121.7%	8.2	1.5	A
	Subtotal	72	69	95.7%	36.9	4.5	D
Total		437	432	98.8%	21.5	2.6	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Existing Conditions
PM Peak Hour

Intersection 1

Airport Way/Atherton Way

Side Street Stop

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	1	1	130.0%	7.5	6.7	A
	Through	61	58	94.6%	1.2	0.2	A
	Right Turn	2	3	140.0%	4.3	0.2	A
	Subtotal	64	62	96.6%	1.6	0.3	A
SB	Left Turn	26	22	82.7%	4.8	0.5	A
	Through	96	97	101.1%	2.6	0.4	A
	Right Turn	59	56	94.4%	3.0	0.5	A
	Subtotal	181	174	96.3%	3.0	0.3	A
EB	Left Turn	35	36	101.7%	22.8	12.3	C
	Through						
	Right Turn	2	2	80.0%	2.5	2.7	A
	Subtotal	37	37	100.5%	21.9	11.6	C
WB	Left Turn	1	1	70.0%	10.6	12.8	B
	Through						
	Right Turn	18	17	91.7%	7.2	3.7	A
	Subtotal	19	17	90.5%	7.8	3.7	A
Total		301	291	96.5%	5.5	2.0	A

Intersection 2

Airport Way/SR 120 WB Ramp

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	18	14	78.9%	39.7	6.6	D
	Through	200	197	98.4%	19.7	3.5	B
	Right Turn						
	Subtotal	218	211	96.7%	21.1	3.3	C
SB	Left Turn						
	Through	155	149	96.2%	16.5	3.3	B
	Right Turn	75	77	102.7%	4.2	0.7	A
	Subtotal	230	226	98.3%	12.3	2.4	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	48	48	99.6%	26.5	2.1	C
	Through						
	Right Turn	89	90	100.7%	29.7	7.1	C
	Subtotal	137	137	100.3%	28.7	4.8	C
Total		585	574	98.2%	19.5	2.8	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Existing Conditions
PM Peak Hour

Intersection 3

Airport Way/SR 120 EB Ramp

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	85	84	98.6%	27.7	2.0	C
	Right Turn	28	29	104.3%	8.3	1.7	A
	Subtotal	113	113	100.0%	22.7	1.9	C
SB	Left Turn	72	68	93.9%	40.5	5.2	D
	Through	132	129	97.8%	18.8	2.2	B
	Right Turn						
	Subtotal	204	197	96.4%	26.2	2.7	C
EB	Left Turn	132	129	98.0%	43.0	11.0	D
	Through						
	Right Turn	48	46	96.5%	13.4	1.6	B
	Subtotal	180	176	97.6%	35.2	8.0	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		497	485	97.6%	28.7	2.2	C

Intersection 4

Airport Way/Coach Ln

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	133	131	98.5%	48.8	5.8	D
	Through	106	112	105.5%	23.7	3.8	C
	Right Turn	50	46	92.6%	17.4	4.4	B
	Subtotal	289	289	100.0%	34.1	3.7	C
SB	Left Turn	5	5	92.0%	61.3	16.6	E
	Through	92	88	96.1%	38.9	5.4	D
	Right Turn	69	69	99.4%	11.4	1.3	B
	Subtotal	166	162	97.3%	27.9	3.4	C
EB	Left Turn	83	82	98.9%	54.7	6.4	D
	Through	27	27	100.7%	44.8	7.2	D
	Right Turn	105	100	95.3%	13.5	1.5	B
	Subtotal	215	209	97.4%	33.8	3.1	C
WB	Left Turn	34	32	95.3%	54.4	10.2	D
	Through	28	28	98.6%	43.2	9.4	D
	Right Turn	5	5	90.0%	8.6	4.4	A
	Subtotal	67	65	96.3%	46.6	6.2	D
Total		737	725	98.3%	33.8	2.3	C

HCM Unsignalized Intersection Capacity Analysis

5: Wawona St. & Airport Way

Existing Conditions
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	42	46	382	91	52	310
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	51	55	460	110	63	373
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1014	515			570	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1014	515			570	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	90			94	
cM capacity (veh/h)	248	560			988	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	106	570	436			
Volume Left	51	0	63			
Volume Right	55	110	0			
cSH	350	1700	988			
Volume to Capacity	0.30	0.34	0.06			
Queue Length 95th (ft)	31	0	5			
Control Delay (s)	19.7	0.0	1.9			
Lane LOS	C		A			
Approach Delay (s)	19.7	0.0	1.9			
Approach LOS	C					
Intersection Summary						
Average Delay		2.6				
Intersection Capacity Utilization		60.0%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

6: Yosemite Avenue & Airport Way

Existing Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	151	44	69	150	198	56	215	142	237	230	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.3	5.3	5.3	5.3	5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1626	3352		1687	3202		1703	1810	1599	1770	1845	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1626	3352		1687	3202		1703	1810	1599	1770	1845	1538
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	18	170	49	78	169	222	63	242	160	266	258	55
RTOR Reduction (vph)	0	17	0	0	170	0	0	0	123	0	0	26
Lane Group Flow (vph)	18	202	0	78	221	0	63	242	37	266	258	29
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	11%	2%	9%	7%	2%	4%	6%	5%	1%	2%	3%	5%
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	2.5	14.5		7.8	19.8		6.9	19.7	19.7	20.9	33.7	33.7
Effective Green, g (s)	2.5	14.5		7.8	19.8		6.9	19.7	19.7	20.9	33.7	33.7
Actuated g/C Ratio	0.03	0.17		0.09	0.23		0.08	0.23	0.23	0.25	0.40	0.40
Clearance Time (s)	5.7	5.7		5.7	5.7		5.3	5.3	5.3	5.3	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	48	572		155	747		138	420	371	436	732	610
v/s Ratio Prot	0.01	c0.06		c0.05	c0.07		0.04	c0.13		c0.15	0.14	
v/s Ratio Perm									0.02			0.02
v/c Ratio	0.38	0.35		0.50	0.30		0.46	0.58	0.10	0.61	0.35	0.05
Uniform Delay, d1	40.4	31.1		36.7	26.8		37.2	28.9	25.6	28.4	17.9	15.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.9	0.4		2.6	0.2		2.4	1.9	0.1	2.5	0.3	0.0
Delay (s)	45.3	31.4		39.3	27.0		39.6	30.8	25.7	30.9	18.2	15.8
Level of Service	D	C		D	C		D	C	C	C	B	B
Approach Delay (s)		32.5			29.1			30.3			23.8	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			28.1			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			84.9			Sum of lost time (s)			27.7			
Intersection Capacity Utilization			56.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Yosemite Ave & McKinley Ave

Existing Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	111	12	9	131	67	32	29	9	97	11	15
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	16	126	14	10	149	76	36	33	10	110	12	17
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total (vph)	142	14	10	225	80	140						
Volume Left (vph)	16	0	10	0	36	110						
Volume Right (vph)	0	14	0	76	10	17						
Hadj (s)	0.36	-0.58	0.53	0.03	0.06	0.25						
Departure Headway (s)	5.7	4.8	5.8	5.3	5.2	5.3						
Degree Utilization, x	0.23	0.02	0.02	0.33	0.11	0.21						
Capacity (veh/h)	594	709	587	649	632	629						
Control Delay (s)	9.2	6.7	7.7	9.8	8.9	9.6						
Approach Delay (s)	9.0		9.7		8.9	9.6						
Approach LOS	A		A		A	A						
Intersection Summary												
Delay			9.4									
HCM Level of Service			A									
Intersection Capacity Utilization			35.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

8: Daniels Street & Milo Candini Drive

Existing Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	78	0	22	87	11	1	0	6	3	1	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		4.0	4.0	4.0	
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	1.00	1.00	
Flt		1.00		1.00	0.98		1.00		0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3539		1770	3481		1770		1583	1770	1863	
Flt Permitted		1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (perm)		3539		1770	3481		1770		1583	1770	1863	
Peak-hour factor, PHF	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Adj. Flow (vph)	0	103	0	29	114	14	1	0	8	4	1	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	7	0	0	0
Lane Group Flow (vph)	0	103	0	29	121	0	1	0	1	4	1	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)		4.8		0.6	9.4		1.9		1.9	1.8	1.8	
Effective Green, g (s)		4.8		0.6	9.4		1.9		1.9	1.8	1.8	
Actuated g/C Ratio		0.19		0.02	0.37		0.08		0.08	0.07	0.07	
Clearance Time (s)		4.0		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	3.0	
Lane Grp Cap (vph)		677		42	1304		134		120	127	134	
v/s Ratio Prot		c0.03		c0.02	0.03		c0.00			c0.00	0.00	
v/s Ratio Perm									0.00			
v/c Ratio		0.15		0.69	0.09		0.01		0.01	0.03	0.01	
Uniform Delay, d1		8.5		12.2	5.1		10.7		10.7	10.8	10.8	
Progression Factor		1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.1		39.1	0.0		0.0		0.0	0.1	0.0	
Delay (s)		8.6		51.3	5.1		10.8		10.7	10.9	10.8	
Level of Service		A		D	A		B		B	B	B	
Approach Delay (s)		8.6			13.6			10.7			10.9	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM Average Control Delay			11.6			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.13									
Actuated Cycle Length (s)			25.1			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			20.0%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Wawona St. & Airport Way

Existing Conditions
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	22	33	655	60	52	644
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	36	712	65	57	700
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1560	747			779	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1560	747			779	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	91			93	
cM capacity (veh/h)	115	412			836	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	60	777	757			
Volume Left	24	0	57			
Volume Right	36	65	0			
cSH	203	1700	836			
Volume to Capacity	0.29	0.46	0.07			
Queue Length 95th (ft)	29	0	5			
Control Delay (s)	30.0	0.0	1.7			
Lane LOS	D		A			
Approach Delay (s)	30.0	0.0	1.7			
Approach LOS	D					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			86.8%	ICU Level of Service	E	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: Yosemite Avenue & Airport Way

Existing Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	303	125	220	193	171	44	361	244	171	331	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.3	5.3	5.3	5.3	5.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.93		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1687	3363		1770	3257		1626	1863	1563	1770	1807	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1687	3363		1770	3257		1626	1863	1563	1770	1807	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	107	333	137	242	212	188	48	397	268	188	364	57
RTOR Reduction (vph)	0	30	0	0	110	0	0	0	118	0	4	0
Lane Group Flow (vph)	107	440	0	242	290	0	48	397	150	188	417	0
Confl. Peds. (#/hr)									1			1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	7%	2%	2%	2%	2%	2%	11%	2%	2%	2%	2%	8%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	12.2	20.5		21.5	29.8		7.2	33.1	33.1	17.9	43.8	
Effective Green, g (s)	12.2	20.5		21.5	29.8		7.2	33.1	33.1	17.9	43.8	
Actuated g/C Ratio	0.11	0.18		0.19	0.26		0.06	0.29	0.29	0.16	0.38	
Clearance Time (s)	5.7	5.7		5.7	5.7		5.3	5.3	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	179	599		331	844		102	536	450	276	688	
v/s Ratio Prot	0.06	c0.13		c0.14	0.09		0.03	c0.21		c0.11	0.23	
v/s Ratio Perm									0.10			
v/c Ratio	0.60	0.74		0.73	0.34		0.47	0.74	0.33	0.68	0.61	
Uniform Delay, d1	49.1	44.7		44.0	34.6		52.1	37.1	32.3	45.9	28.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.3	4.7		8.1	0.2		3.4	5.5	0.4	6.8	1.5	
Delay (s)	54.3	49.4		52.1	34.9		55.5	42.5	32.7	52.6	30.2	
Level of Service	D	D		D	C		E	D	C	D	C	
Approach Delay (s)		50.3			41.4			39.7			37.1	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay			41.9			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			115.0			Sum of lost time (s)			22.0			
Intersection Capacity Utilization			71.6%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

7: Yosemite Ave & McKinley Ave

Existing Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	24	213	52	27	153	160	14	15	15	130	42	13
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	30	263	64	33	189	198	17	19	19	160	52	16
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total (vph)	293	64	33	386	54	228						
Volume Left (vph)	30	0	33	0	17	160						
Volume Right (vph)	0	64	0	198	19	16						
Hadj (s)	0.31	-0.67	0.57	-0.21	-0.08	0.15						
Departure Headway (s)	6.3	5.3	6.5	5.7	6.4	6.2						
Degree Utilization, x	0.51	0.10	0.06	0.62	0.10	0.39						
Capacity (veh/h)	543	636	526	597	464	533						
Control Delay (s)	14.7	7.7	8.7	16.3	10.1	13.1						
Approach Delay (s)	13.4		15.7		10.1	13.1						
Approach LOS	B		C		B	B						
Intersection Summary												
Delay			14.1									
HCM Level of Service			B									
Intersection Capacity Utilization			54.8%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

8: Daniels Street & Milo Candini Drive

Existing Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	439	1	77	66	385	1	4	75	23	3	3
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		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.87		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3538		1770	3029		1770	1863	1583	1770	1712	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3538		1770	3029		1770	1863	1583	1770	1712	
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)	3	472	1	83	71	414	1	4	81	25	3	3
RTOR Reduction (vph)	0	0	0	0	235	0	0	0	72	0	3	0
Lane Group Flow (vph)	3	473	0	83	250	0	1	4	9	25	3	0
Confl. Peds. (#/hr)						2						2
Confl. Bikes (#/hr)			2									
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)	0.5	15.2		4.4	19.1		4.9	4.9	4.9	3.6	3.6	
Effective Green, g (s)	0.5	15.2		4.4	19.1		4.9	4.9	4.9	3.6	3.6	
Actuated g/C Ratio	0.01	0.34		0.10	0.43		0.11	0.11	0.11	0.08	0.08	
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	20	1219		177	1312		197	207	176	144	140	
v/s Ratio Prot	0.00	c0.13		c0.05	c0.08		0.00	0.00		c0.01	0.00	
v/s Ratio Perm									c0.01			
v/c Ratio	0.15	0.39		0.47	0.19		0.01	0.02	0.05	0.17	0.02	
Uniform Delay, d1	21.6	10.9		18.7	7.7		17.4	17.5	17.5	18.9	18.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	0.2		2.0	0.1		0.0	0.0	0.1	0.6	0.1	
Delay (s)	25.1	11.1		20.7	7.8		17.4	17.5	17.6	19.4	18.7	
Level of Service	C	B		C	A		B	B	B	B	B	
Approach Delay (s)		11.2			9.7			17.6			19.3	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM Average Control Delay			11.2			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			44.1			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			37.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Phone: Fax:
E-mail:

----- Operational Analysis -----

Analyst:
Agency or Company: Fehr & Peers
Date Performed: 3/10/2014
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 EB
From/To: Yosemite Ave/Airport Way
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

----- Flow Inputs and Adjustments -----

Volume, V	2058	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	547	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1182	pc/h/ln

----- Speed Inputs and Adjustments -----

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

----- LOS and Performance Measures -----

Flow rate, vp	1182	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	18.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-mail:

----- Operational Analysis -----

Analyst: KI3
Agency or Company: Fehr & Peers
Date Performed: 3/10/2014
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 WB
From/To: Airport Way/Yosemite Avenue
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

----- Flow Inputs and Adjustments -----

Volume, V	3194	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	868	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1823	pc/h/ln

----- Speed Inputs and Adjustments -----

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

----- LOS and Performance Measures -----

Flow rate, vp	1823	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.5	mi/h
Number of lanes, N	2	
Density, D	29.2	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 3/10/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Airport Way Off Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2058	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	247	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2058	247		vph
Peak-hour factor, PHF	0.95	0.91		
Peak 15-min volume, v15	542	68		v
Trucks and buses	16	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.926	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2340	280	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 2340 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2340	4700	No
$v_{FO} = v_F - v_R$	2060	4700	No
v_R	280	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2340$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2340	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 \frac{L}{D} = 23.0 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.323$	
Space mean speed in ramp influence area,	$S_R = 57.6$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.6$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 3/10/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Airport Way On Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1811	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	271	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1811	271		vph
Peak-hour factor, PHF	0.94	0.85		
Peak 15-min volume, v15	482	80		v
Trucks and buses	16	7		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.926	0.966	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2081	330	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 2081$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2411	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2081$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2411	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 20.5$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.313$	
Space mean speed in ramp influence area,	$S_R = 57.8$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 57.8$	mph

Phone: _____ Fax: _____
 E-mail: _____

----- Diverge Analysis -----

Analyst: _____
 Agency/Co.: Fehr & Peers
 Date performed: 3/6/2014
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 WB
 Junction: Airport Way Off Ramp
 Jurisdiction: District 10
 Analysis Year: Existing Conditions
 Description: FEZ EIR

----- Freeway Data -----

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3034	vph

----- Off Ramp Data -----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	267	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

----- Adjacent Ramp Data (if one exists) -----

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

----- Conversion to pc/h Under Base Conditions -----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3034	267		vph
Peak-hour factor, PHF	0.92	0.86		
Peak 15-min volume, v15	824	78		v
Trucks and buses	10	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3463	324	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 3463 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3463	4700	No
$v_{FO} = v_F - v_R$	3139	4700	No
v_R	324	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3463$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3463	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 32.7 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.327$	
Space mean speed in ramp influence area,	$S_R = 57.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.5$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 3/6/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Airport Way On Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2767	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	427	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2767	427		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	752	116		v
Trucks and buses	10	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3158	473	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 3158$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3631	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3158$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3631	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 28.9$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.401$	
Space mean speed in ramp influence area,	$S_R = 55.8$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 55.8$	mph

Phone: Fax:
E-mail:

-----Diverge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 4/11/2013
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Union Rd off-ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2082	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	201	vph
Length of first accel/decel lane	175	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2082	201		vph
Peak-hour factor, PHF	0.94	0.70		
Peak 15-min volume, v15	554	72		v
Trucks and buses	16	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.926	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2392	290	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 2392 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2392	4700	No
$v_{FO} = v_F - v_R$	2102	4700	No
v_R	290	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2392$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2392	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 23.2 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.324$	
Space mean speed in ramp influence area,	$S_R = 57.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.5$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 4/11/2013
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Union Rd On Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2710	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	324	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2710	324		vph
Peak-hour factor, PHF	0.92	0.73		
Peak 15-min volume, v15	736	111		v
Trucks and buses	10	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3093	448	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v (P) = 3093 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3541	4700	No
FO			
v or v	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v or v	> 2700 pc/h?	No	
3 av34			
Is v or v	> 1.5 v /2	No	
3 av34	12		
If yes, v	= 3093	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3541	4600	No
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 27.9 pc/mi/ln

R R 12 A

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M = 0.384	
	S	
Space mean speed in ramp influence area,	S = 56.2	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 56.2	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:
Agency or Company: Fehr & Peers
Date Performed: 3/10/2014
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 EB
From/To: Yosemite Ave/Airport Way
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

Flow Inputs and Adjustments

Volume, V	3851	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1013	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2118	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2118	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.7	mi/h
Number of lanes, N	2	
Density, D	36.7	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-mail:

----- Operational Analysis -----

Analyst:
Agency or Company: Fehr & Peers
Date Performed: 3/10/2014
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 WB
From/To: Airport Way/Yosemite Ave
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

----- Flow Inputs and Adjustments -----

Volume, V	2449	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	756	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1602	pc/h/ln

----- Speed Inputs and Adjustments -----

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

----- LOS and Performance Measures -----

Flow rate, vp	1602	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.4	mi/h
Number of lanes, N	2	
Density, D	24.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 3/10/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Airport Way Off Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3851	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	677	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3851	677		vph
Peak-hour factor, PHF	0.95	0.91		
Peak 15-min volume, v15	1013	186		v
Trucks and buses	9	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4236	751	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 4236 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{Fi}$	4236	4700	No
$v_F = v_F - v_R$	3485	4700	No
v_R	751	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4236$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4236	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 \frac{L}{D} = 39.3 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$D = 0.366$	
Space mean speed in ramp influence area,	$S_R = 56.6$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 56.6$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 3/10/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Airport On Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3174	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	375	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3174	375		vph
Peak-hour factor, PHF	0.95	0.82		
Peak 15-min volume, v15	835	114		v
Trucks and buses	9	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3491	464	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 3491$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3955	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3491$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3955	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 31.4$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.457$	
Space mean speed in ramp influence area,	$S_R = 54.5$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 54.5$	mph

Phone: Fax:
E-mail:

-----Diverge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 3/10/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Airport Way Off Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2620	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	518	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2620	518		vph
Peak-hour factor, PHF	0.81	0.86		
Peak 15-min volume, v15	809	151		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3429	608	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 3429 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3429	4700	No
$v_{FO} = v_F - v_R$	2821	4700	No
v_R	608	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3429$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3429	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 \frac{L}{D} = 32.4 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.353$	
Space mean speed in ramp influence area,	$S_R = 56.9$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 56.9$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 3/10/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Airport On Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2102	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	347	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2102	347		vph
Peak-hour factor, PHF	0.81	0.91		
Peak 15-min volume, v15	649	95		v
Trucks and buses	12	5		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.976	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2751	391	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 2751$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3142	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2751$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3142	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 25.1$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.344$	
Space mean speed in ramp influence area,	$S_R = 57.1$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 57.1$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 4/11/2013
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Union Rd Off Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3549	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	605	vph
Length of first accel/decel lane	175	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3549	605		vph
Peak-hour factor, PHF	0.95	0.92		
Peak 15-min volume, v15	934	164		v
Trucks and buses	9	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3904	664	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 3904 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3904	4700	No
$v_{FO} = v_F - v_R$	3240	4700	No
v_R	664	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3904$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3904	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 36.3 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$D_S = 0.358$	
Space mean speed in ramp influence area,	$S_R = 56.8$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 56.8$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 4/11/2013
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Union Rd On Ramp
Jurisdiction: District 10
Analysis Year: Existing Conditions
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2357	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	263	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2357	263		vph
Peak-hour factor, PHF	0.81	0.93		
Peak 15-min volume, v15	727	71		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3084	286	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 3084$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3370	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3084$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3370	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 26.6$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.362$	
Space mean speed in ramp influence area,	$S_R = 56.7$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 56.7$	mph

Major Street Airport Way
Minor Street Atherton Dr

Project FEZ EIR
Scenario Existing Conditions
Peak Hour AM

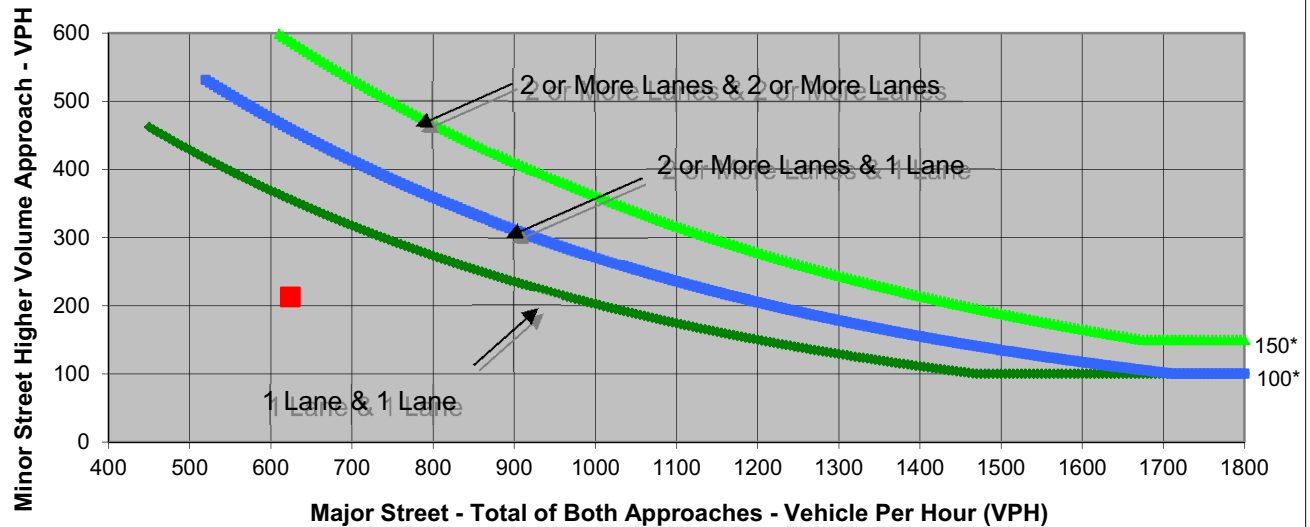
Turn Movement Volumes

	NB	SB	EB	WB
Left	3	48	207	6
Through	326	150	1	0
Right	4	100	5	99
Total	326	298	213	105

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Atherton Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	624	213	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Airport Way
Minor Street Atherton Dr

Project FEZ EIR
Scenario Existing Conditions
Peak Hour PM

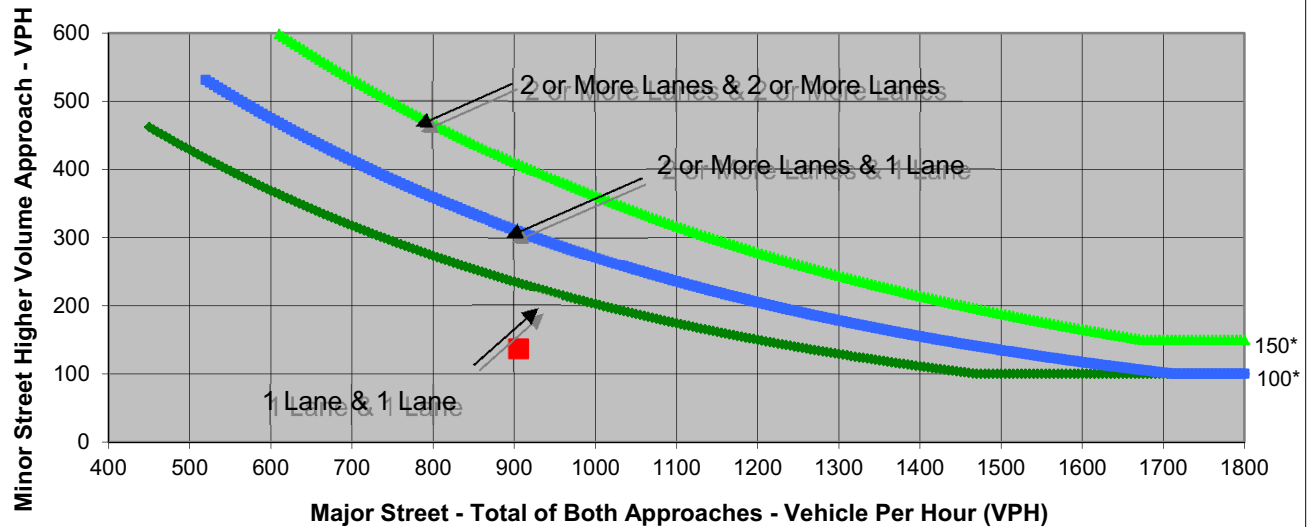
Turn Movement Volumes

	NB	SB	EB	WB
Left	5	96	130	2
Through	228	361	1	0
Right	8	221	6	69
Total	228	678	137	71

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Atherton Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	906	137	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Wawona Street**

Project **FEZ EIR**
Scenario **Existing Conditions**
Peak Hour **AM**

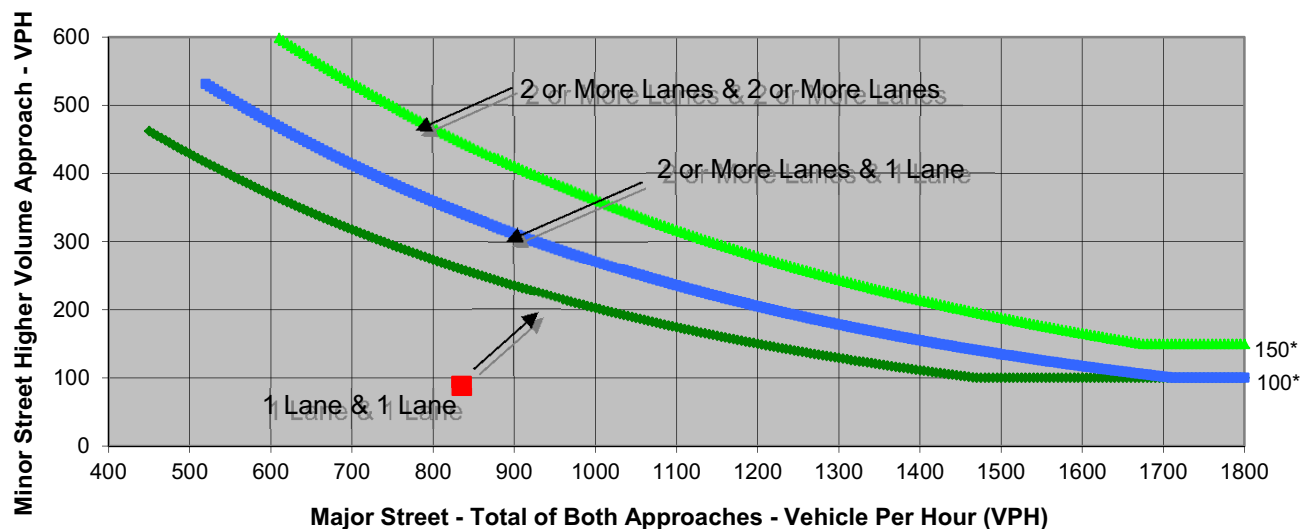
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	52	0	42
Through	382	310	0	0
Right	91	0	0	46
Total	473	362	0	88

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Wawona Street	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	835	88	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Wawona Street**

Project **FEZ EIR**
Scenario **Existing Conditions**
Peak Hour **PM**

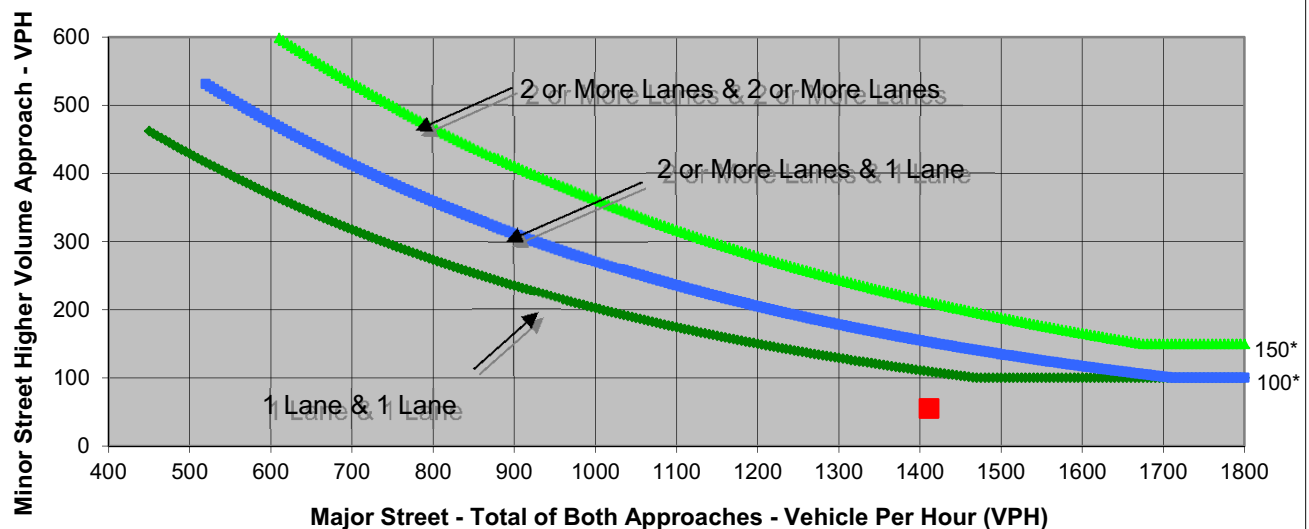
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	52	0	22
Through	655	644	0	0
Right	60	0	0	33
Total	715	696	0	55

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Wawona Street	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	1,411	55	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Yosemite Avenue
Minor Street McKinley Avenue

Project FEZ EIR
Scenario Existing Conditions
Peak Hour AM

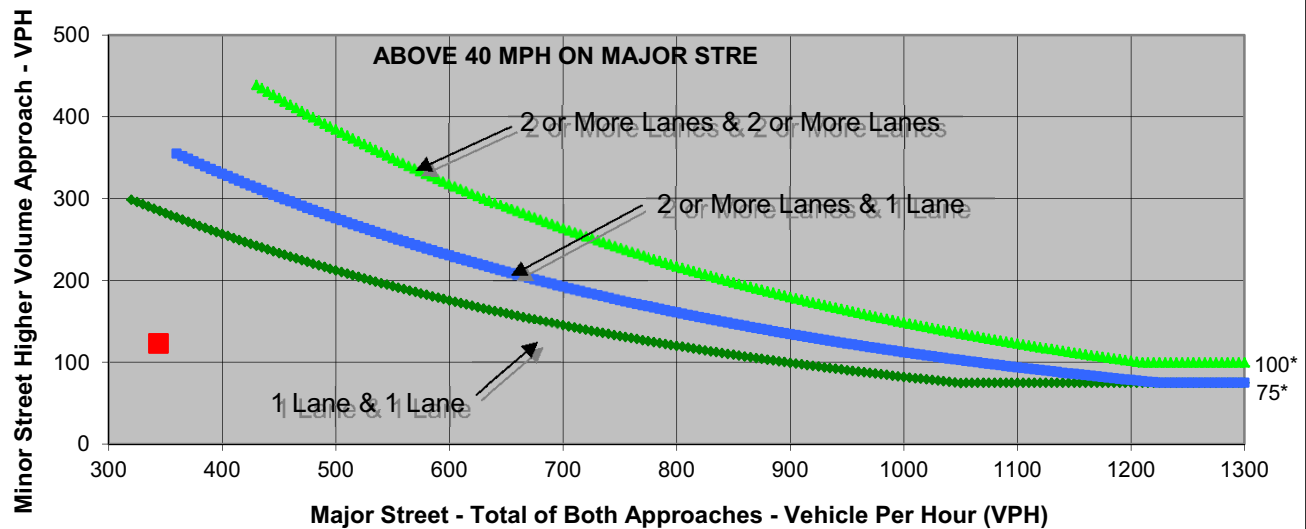
Turn Movement Volumes

	NB	SB	EB	WB
Left	32	97	14	9
Through	29	11	111	131
Right	9	15	12	67
Total	70	123	137	207

Major Street Direction

	North/South
X	East/West

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Yosemite Avenue	Minor Street McKinley Avenue	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	344	123	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Yosemite Avenue
Minor Street McKinley Avenue

Project FEZ EIR
Scenario Existing Conditions
Peak Hour PM

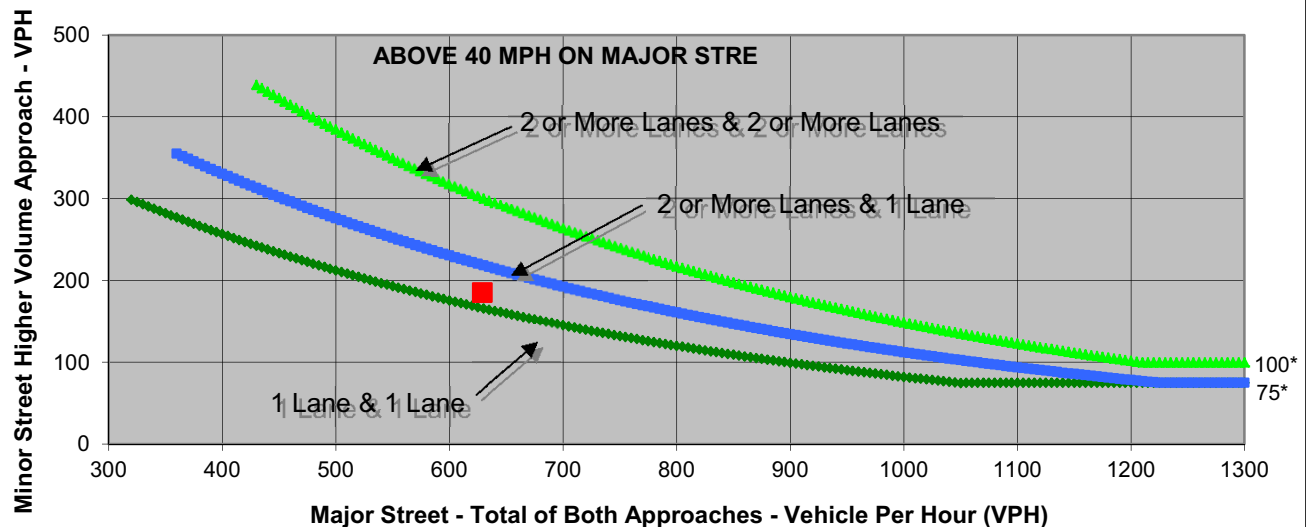
Turn Movement Volumes

	NB	SB	EB	WB
Left	14	130	24	27
Through	15	42	213	153
Right	15	13	52	160
Total	44	185	289	340

Major Street Direction

	North/South
X	East/West

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Yosemite Avenue	Minor Street McKinley Avenue	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	629	185	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Existing Plus Project Conditions Technical Calculations

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Existing Plus Project Conditions
AM Peak Hour

Intersection 1

Airport Way/Atherton Drive

Side Street Stop

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	1	1	90.0%	4.2	3.9	A
	Through	105	111	106.0%	1.9	0.2	A
	Right Turn	1	1	110.0%	2.2	2.3	A
	Subtotal	107	113	105.9%	2.0	0.2	A
SB	Left Turn	14	15	107.9%	5.5	1.3	A
	Through	44	45	102.0%	1.6	0.3	A
	Right Turn	27	26	97.4%	1.8	0.5	A
	Subtotal	85	86	101.5%	2.4	0.4	A
EB	Left Turn	59	59	99.2%	79.1	47.6	F
	Through						
	Right Turn	2	2	115.0%	2.1	1.5	A
	Subtotal	61	61	99.7%	76.0	46.0	F
WB	Left Turn	2	2	105.0%	17.9	13.5	C
	Through						
	Right Turn	30	32	107.3%	18.1	5.6	C
	Subtotal	32	34	107.2%	18.0	5.4	C
Total		285	295	103.4%	19.1	9.2	C

Intersection 2

Airport Way/SR120 EB Ramps-SR 120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	141	141	100.1%	20.3	1.9	C
	Right Turn	52	57	109.8%	7.6	1.0	A
	Subtotal	193	198	102.7%	16.6	1.5	B
SB	Left Turn	35	32	91.7%	36.1	5.2	D
	Through	67	68	101.5%	9.7	1.3	A
	Right Turn						
	Subtotal	102	100	98.1%	18.2	2.4	B
EB	Left Turn	88	88	100.2%	38.5	10.5	D
	Through	1	0	30.0%	2.6	6.4	A
	Right Turn	18	18	97.2%	6.8	0.7	A
	Subtotal	107	106	99.1%	33.3	8.9	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		402	404	100.6%	21.3	2.6	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Existing Plus Project Conditions
AM Peak Hour

Intersection 3

Airport Way/SR 120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	41	39	94.9%	37.6	6.9	D
	Through	189	195	103.1%	19.9	5.5	B
	Right Turn						
	Subtotal	230	234	101.6%	22.8	4.8	C
SB	Left Turn						
	Through	80	77	96.0%	15.2	2.6	B
	Right Turn	92	95	103.0%	7.1	1.0	A
	Subtotal	172	172	99.8%	10.8	1.1	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	23	25	106.5%	22.8	3.5	C
	Through						
	Right Turn	100	96	96.0%	27.1	5.9	C
	Subtotal	123	121	98.0%	26.5	5.0	C
Total		525	526	100.2%	19.8	3.2	B

Intersection 4

Airport Way/Daniels Street

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	122	119	97.2%	41.7	10.1	D
	Through	118	123	103.9%	17.3	3.8	B
	Right Turn	49	47	95.5%	12.5	4.0	B
	Subtotal	289	288	99.7%	26.6	6.5	C
SB	Left Turn	5	6	122.0%	56.9	21.7	E
	Through	77	70	91.2%	28.5	6.5	C
	Right Turn	41	44	106.3%	9.1	2.1	A
	Subtotal	123	120	97.5%	22.8	5.2	C
EB	Left Turn	15	15	101.3%	39.7	7.0	D
	Through	7	7	102.9%	44.5	10.4	D
	Right Turn	40	41	102.3%	9.0	0.9	A
	Subtotal	62	63	102.1%	20.0	2.7	B
WB	Left Turn	55	55	99.3%	44.9	6.1	D
	Through	15	16	106.0%	36.9	6.0	D
	Right Turn	6	6	103.3%	8.4	1.4	A
	Subtotal	76	77	100.9%	40.5	5.5	D
Total		550	548	99.6%	27.0	4.6	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Existing Plus Great Wold Lodge Conditions
PM Peak Hour

Intersection 1

Airport Way/Atherton Way

Side Street Stop

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	1	1	100.0%	13.9	13.9	B
	Through	55	55	99.6%	1.0	0.3	A
	Right Turn	2	2	115.0%	4.7	0.6	A
	Subtotal	58	58	100.2%	1.5	0.4	A
SB	Left Turn	26	25	96.2%	4.3	0.7	A
	Through	92	90	97.3%	2.3	0.4	A
	Right Turn	53	55	103.4%	2.7	0.3	A
	Subtotal	171	169	99.0%	2.7	0.3	A
EB	Left Turn	29	28	96.6%	17.8	5.4	C
	Through						
	Right Turn	2	2	95.0%	3.1	3.3	A
	Subtotal	31	30	96.5%	16.9	4.9	C
WB	Left Turn	1	0	40.0%	1.6	3.9	A
	Through						
	Right Turn	18	19	105.6%	4.8	1.2	A
	Subtotal	19	19	102.1%	5.2	1.2	A
Total		279	277	99.2%	4.2	0.7	A

Intersection 2

Airport Way/SR 120 WB Ramps-SR 120 WB Ramp

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	18	15	84.4%	36.7	8.3	D
	Through	196	191	97.7%	18.0	2.2	B
	Right Turn						
	Subtotal	214	207	96.5%	19.4	1.7	B
SB	Left Turn						
	Through	181	178	98.3%	18.1	2.5	B
	Right Turn	102	94	92.4%	3.9	0.6	A
	Subtotal	283	272	96.2%	13.2	1.6	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	48	50	103.3%	26.3	2.6	C
	Through						
	Right Turn	99	99	100.1%	27.4	6.4	C
	Subtotal	147	149	101.2%	27.1	4.2	C
Total		644	628	97.4%	18.6	1.8	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Existing Plus Great Wold Lodge Conditions
PM Peak Hour

Intersection 3

Airport Way/SR 120 EB Ramp

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	74	73	98.1%	36.6	4.9	D
	Right Turn	28	29	102.1%	11.1	2.2	B
	Subtotal	102	101	99.2%	29.3	4.1	C
SB	Left Turn	107	101	94.1%	40.1	3.8	D
	Through	123	122	99.3%	20.2	3.6	C
	Right Turn						
	Subtotal	230	223	96.9%	29.2	3.4	C
EB	Left Turn	139	136	97.6%	61.8	19.3	E
	Through						
	Right Turn	48	51	105.6%	13.1	2.3	B
	Subtotal	187	186	99.7%	48.7	14.6	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		519	510	98.3%	36.4	6.5	D

Intersection 4

Airport Way/Daniels St

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	139	136	98.1%	43.7	6.2	D
	Through	106	109	102.5%	17.2	3.6	B
	Right Turn	50	52	104.0%	11.3	2.5	B
	Subtotal	295	297	100.7%	28.3	4.8	C
SB	Left Turn	5	4	84.0%	63.6	17.4	E
	Through	92	91	98.6%	32.6	2.7	C
	Right Turn	70	70	99.7%	10.8	1.5	B
	Subtotal	167	165	98.6%	24.2	1.9	C
EB	Left Turn	96	93	96.5%	59.3	6.1	E
	Through	31	29	94.5%	53.8	5.9	D
	Right Turn	157	151	95.9%	26.6	6.8	C
	Subtotal	284	272	95.9%	40.8	4.8	D
WB	Left Turn	34	33	96.8%	52.9	9.6	D
	Through	29	27	92.8%	47.0	7.4	D
	Right Turn	5	4	86.0%	10.9	2.2	B
	Subtotal	68	64	94.3%	47.6	6.1	D
Total		814	798	98.1%	33.3	2.5	C

HCM Unsignalized Intersection Capacity Analysis

5: Wawona St. & Airport Way

Existing Plus Project Conditions
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	46	46	390	92	52	374
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	55	55	470	111	63	451
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1101	525			581	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1101	525			581	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	90			94	
cM capacity (veh/h)	219	552			979	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	111	581	513			
Volume Left	55	0	63			
Volume Right	55	111	0			
cSH	314	1700	979			
Volume to Capacity	0.35	0.34	0.06			
Queue Length 95th (ft)	39	0	5			
Control Delay (s)	22.6	0.0	1.8			
Lane LOS	C		A			
Approach Delay (s)	22.6	0.0	1.8			
Approach LOS	C					
Intersection Summary						
Average Delay		2.8				
Intersection Capacity Utilization		64.0%		ICU Level of Service		C
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

6: Yosemite Avenue & Airport Way

Existing Plus Project Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	151	53	105	150	198	57	218	146	237	249	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.3	5.3	5.3	5.3	5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.96		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1626	3341		1687	3202		1703	1810	1599	1770	1845	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1626	3341		1687	3202		1703	1810	1599	1770	1845	1538
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	18	170	60	118	169	222	64	245	164	266	280	55
RTOR Reduction (vph)	0	23	0	0	159	0	0	0	128	0	0	25
Lane Group Flow (vph)	18	207	0	118	232	0	64	245	36	266	280	30
Heavy Vehicles (%)	11%	2%	9%	7%	2%	4%	6%	5%	1%	2%	3%	5%
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	2.6	16.2		12.1	25.7		7.2	19.8	19.8	21.0	33.6	33.6
Effective Green, g (s)	2.6	16.2		12.1	25.7		7.2	19.8	19.8	21.0	33.6	33.6
Actuated g/C Ratio	0.03	0.18		0.13	0.28		0.08	0.22	0.22	0.23	0.37	0.37
Clearance Time (s)	5.7	5.7		5.7	5.7		5.3	5.3	5.3	5.3	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	46	594		224	903		135	393	348	408	680	567
v/s Ratio Prot	0.01	c0.06		c0.07	0.07		0.04	c0.14		c0.15	0.15	
v/s Ratio Perm									0.02			0.02
v/c Ratio	0.39	0.35		0.53	0.26		0.47	0.62	0.10	0.65	0.41	0.05
Uniform Delay, d1	43.5	32.8		36.8	25.3		40.1	32.3	28.5	31.7	21.4	18.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	0.4		2.2	0.2		2.6	3.1	0.1	3.7	0.4	0.0
Delay (s)	48.9	33.2		39.1	25.5		42.8	35.3	28.7	35.5	21.8	18.5
Level of Service	D	C		D	C		D	D	C	D	C	B
Approach Delay (s)		34.3			28.6			34.0			27.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			30.4			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			91.1			Sum of lost time (s)			22.0			
Intersection Capacity Utilization			56.8%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 7: Yosemite Ave & McKinley Ave

Existing Plus Project Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	111	16	9	131	67	33	32	9	97	27	15
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	16	126	18	10	149	76	38	36	10	110	31	17
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total (vph)	142	18	10	225	84	158						
Volume Left (vph)	16	0	10	0	38	110						
Volume Right (vph)	0	18	0	76	10	17						
Hadj (s)	0.36	-0.58	0.53	0.03	0.07	0.22						
Departure Headway (s)	5.8	4.9	5.9	5.4	5.3	5.3						
Degree Utilization, x	0.23	0.02	0.02	0.34	0.12	0.23						
Capacity (veh/h)	585	695	578	638	625	629						
Control Delay (s)	9.3	6.8	7.8	9.9	9.0	9.9						
Approach Delay (s)	9.0		9.8		9.0	9.9						
Approach LOS	A		A		A	A						
Intersection Summary												
Delay			9.5									
HCM Level of Service			A									
Intersection Capacity Utilization			36.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

8: Daniels Street & Milo Candini Drive

Existing Plus Project Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	111	4	22	430	11	20	0	6	3	1	16
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		4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00		1.00	1.00	1.00	
Flt	1.00	1.00		1.00	1.00		1.00		0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3522		1770	3526		1770		1583	1770	1596	
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (perm)	1770	3522		1770	3526		1770		1583	1770	1596	
Peak-hour factor, PHF	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Adj. Flow (vph)	7	146	5	29	566	14	26	0	8	4	1	21
RTOR Reduction (vph)	0	2	0	0	1	0	0	0	7	0	19	0
Lane Group Flow (vph)	7	149	0	29	579	0	26	0	1	4	3	0
Turn Type	Prot			Prot			Split			Perm		Split
Protected Phases	7	4		3	8		2	2			6	6
Permitted Phases									2			
Actuated Green, G (s)	0.4	19.0		0.6	19.2		3.3		3.3	3.1	3.1	
Effective Green, g (s)	0.4	19.0		0.6	19.2		3.3		3.3	3.1	3.1	
Actuated g/C Ratio	0.01	0.45		0.01	0.46		0.08		0.08	0.07	0.07	
Clearance Time (s)	4.0	4.0		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	3.0	3.0	
Lane Grp Cap (vph)	17	1593		25	1612		139		124	131	118	
v/s Ratio Prot	0.00	0.04		c0.02	c0.16		c0.01			c0.00	0.00	
v/s Ratio Perm									0.00			
v/c Ratio	0.41	0.09		1.16	0.36		0.19		0.01	0.03	0.02	
Uniform Delay, d1	20.7	6.6		20.7	7.4		18.1		17.8	18.1	18.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	15.4	0.0		233.2	0.1		0.7		0.0	0.1	0.1	
Delay (s)	36.1	6.6		253.9	7.5		18.7		17.9	18.2	18.1	
Level of Service	D	A		F	A		B		B	B	B	
Approach Delay (s)		7.9			19.3			18.5			18.1	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM Average Control Delay			17.0			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			42.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			26.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 5: Wawona St. & Airport Way

Existing Plus Project Conditions
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	22	33	715	64	52	657
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	36	777	70	57	714
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1639	812			847	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1639	812			847	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	91			93	
cM capacity (veh/h)	102	379			790	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	60	847	771			
Volume Left	24	0	57			
Volume Right	36	70	0			
cSH	182	1700	790			
Volume to Capacity	0.33	0.50	0.07			
Queue Length 95th (ft)	34	0	6			
Control Delay (s)	34.1	0.0	1.9			
Lane LOS	D		A			
Approach Delay (s)	34.1	0.0	1.9			
Approach LOS	D					
Intersection Summary						
Average Delay		2.1				
Intersection Capacity Utilization		87.5%		ICU Level of Service	E	
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

6: Yosemite Avenue & Airport Way

Existing Plus Project Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	303	127	226	193	171	52	380	277	171	336	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.3	5.3	5.3	5.3	5.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.93		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1687	3382		1770	3290		1626	1863	1583	1770	1811	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1687	3382		1770	3290		1626	1863	1583	1770	1811	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	107	333	140	248	212	188	57	418	304	188	369	57
RTOR Reduction (vph)	0	31	0	0	110	0	0	0	126	0	4	0
Lane Group Flow (vph)	107	442	0	248	290	0	57	418	178	188	422	0
Heavy Vehicles (%)	7%	2%	2%	2%	2%	2%	11%	2%	2%	2%	2%	8%
Turn Type	Prot			Prot			Prot			Perm		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	12.3	20.6		22.1	30.4		7.6	34.5	34.5	18.1	45.0	
Effective Green, g (s)	12.3	20.6		22.1	30.4		7.6	34.5	34.5	18.1	45.0	
Actuated g/C Ratio	0.10	0.18		0.19	0.26		0.06	0.29	0.29	0.15	0.38	
Clearance Time (s)	5.7	5.7		5.7	5.7		5.3	5.3	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	177	594		333	853		105	548	466	273	695	
v/s Ratio Prot	0.06	c0.13		c0.14	0.09		0.04	c0.22		c0.11	0.23	
v/s Ratio Perm									0.11			
v/c Ratio	0.60	0.74		0.74	0.34		0.54	0.76	0.38	0.69	0.61	
Uniform Delay, d1	50.2	45.9		44.9	35.3		53.2	37.7	32.9	46.9	29.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.7	5.1		8.7	0.2		5.6	6.2	0.5	7.1	1.5	
Delay (s)	55.9	50.9		53.7	35.5		58.8	43.9	33.4	54.0	30.6	
Level of Service	E	D		D	D		E	D	C	D	C	
Approach Delay (s)		51.8			42.5			40.9			37.7	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay			43.0			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			117.3			Sum of lost time (s)			22.0			
Intersection Capacity Utilization			72.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Yosemite Ave & McKinley Ave

Existing Plus Project Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	24	213	53	27	153	160	18	30	15	130	47	13
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	30	263	65	33	189	198	22	37	19	160	58	16
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total (vph)	293	65	33	386	78	235						
Volume Left (vph)	30	0	33	0	22	160						
Volume Right (vph)	0	65	0	198	19	16						
Hadj (s)	0.31	-0.67	0.57	-0.21	-0.02	0.14						
Departure Headway (s)	6.5	5.5	6.7	5.9	6.6	6.3						
Degree Utilization, x	0.53	0.10	0.06	0.63	0.14	0.41						
Capacity (veh/h)	529	616	512	582	458	522						
Control Delay (s)	15.3	7.9	8.9	17.3	10.7	13.6						
Approach Delay (s)	13.9		16.6		10.7	13.6						
Approach LOS	B		C		B	B						
Intersection Summary												
Delay			14.7									
HCM Level of Service			B									
Intersection Capacity Utilization			55.1%	ICU Level of Service		B						
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

8: Daniels Street & Milo Candini Drive

Existing Plus Project Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	711	17	77	97	385	7	4	75	23	3	13
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		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.88		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3527		1770	3115		1770	1863	1583	1770	1633	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3527		1770	3115		1770	1863	1583	1770	1633	
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)	22	765	18	83	104	414	8	4	81	25	3	14
RTOR Reduction (vph)	0	1	0	0	183	0	0	0	74	0	13	0
Lane Group Flow (vph)	22	782	0	83	335	0	8	4	7	25	4	0
Turn Type	Prot			Prot			Split			Perm		Split
Protected Phases	7	4		3	8		2	2			6	6
Permitted Phases									2			
Actuated Green, G (s)	0.6	31.1		4.5	35.0		5.5	5.5	5.5	5.5	5.5	
Effective Green, g (s)	0.6	31.1		4.5	35.0		5.5	5.5	5.5	5.5	5.5	
Actuated g/C Ratio	0.01	0.50		0.07	0.56		0.09	0.09	0.09	0.09	0.09	
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	17	1752		127	1742		156	164	139	156	143	
v/s Ratio Prot	0.01	c0.22		c0.05	c0.11		c0.00	0.00		c0.01	0.00	
v/s Ratio Perm									0.00			
v/c Ratio	1.29	0.45		0.65	0.19		0.05	0.02	0.05	0.16	0.03	
Uniform Delay, d1	31.0	10.2		28.3	6.8		26.2	26.1	26.2	26.4	26.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	323.2	0.2		11.5	0.1		0.1	0.1	0.2	0.5	0.1	
Delay (s)	354.2	10.4		39.7	6.9		26.3	26.2	26.3	26.9	26.2	
Level of Service	F	B		D	A		C	C	C	C	C	
Approach Delay (s)		19.8			11.4			26.3			26.6	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			17.1			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			62.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			42.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Phone: Fax:
E-mail:

----- Operational Analysis -----

Analyst:
Agency or Company: Fehr & Peers
Date Performed: 06/20/2014
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 EB
From/To: Yosemite Ave/Airport Way
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

----- Flow Inputs and Adjustments -----

Volume, V	2165	veh/h
Peak-hour factor, PHF	0.94	
Peak 15-min volume, v15	576	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1244	pc/h/ln

----- Speed Inputs and Adjustments -----

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

----- LOS and Performance Measures -----

Flow rate, vp	1244	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	19.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-mail:

----- Operational Analysis -----

Analyst:
Agency or Company: Fehr & Peers
Date Performed: 3/10/2014
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 WB
From/To: Airport Way/Yosemite Avenue
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

----- Flow Inputs and Adjustments -----

Volume, V	3209	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	872	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1831	pc/h/ln

----- Speed Inputs and Adjustments -----

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

----- LOS and Performance Measures -----

Flow rate, vp	1831	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.4	mi/h
Number of lanes, N	2	
Density, D	29.4	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-mail:

-----Diverge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 06/20/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Airport Way Off Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	65.0	mph	
Volume on freeway	2165	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	45.0	mph	
Volume on ramp	354	vph	
Length of first accel/decel lane	150	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2165		354			vph
Peak-hour factor, PHF	0.95		0.91			
Peak 15-min volume, v15	570		97			v
Trucks and buses	16		6			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.926	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2461	401	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 2461 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2461	4700	No
$v_{FO} = v_F - v_R$	2060	4700	No
v_R	401	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2461$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2461	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 24.1 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.334$	
Space mean speed in ramp influence area,	$S_R = 57.3$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.3$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 06/20/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Airport Way On Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1811	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	293	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1811	293		vph
Peak-hour factor, PHF	0.94	0.85		
Peak 15-min volume, v15	482	86		v
Trucks and buses	16	7		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.926	0.966	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2081	357	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 2081$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2438	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2081$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2438	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 20.7$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.314$	
Space mean speed in ramp influence area,	$S_R = 57.8$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 57.8$	mph

Phone: Fax:
E-mail:

-----Diverge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 06/20/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Airport Way Off Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	65.0	mph	
Volume on freeway	3175	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	45.0	mph	
Volume on ramp	408	vph	
Length of first accel/decel lane	150	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3175		408			vph
Peak-hour factor, PHF	0.92		0.86			
Peak 15-min volume, v15	863		119			v
Trucks and buses	10		9			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.952	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3624	496	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 3624 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3624	4700	No
$v_{FO} = v_F - v_R$	3128	4700	No
v_R	496	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3624$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3624	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 \frac{L}{D} = 34.1 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.343$	
Space mean speed in ramp influence area,	$S_R = 57.1$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.1$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 3/6/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Airport Way On Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2767	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	442	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2767	442		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	752	120		v
Trucks and buses	10	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3158	490	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v (P) = 3158 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3648	4700	No
FO			
v or v	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v or v	> 2700 pc/h?	No	
3 av34			
Is v or v	> 1.5 v /2	No	
3 av34	12		
If yes, v	= 3158	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3648	4600	No
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.0 pc/mi/ln

R R 12 A

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M = 0.403	
	S	
Space mean speed in ramp influence area,	S = 55.7	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 55.7	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 4/11/2013
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Union Rd off-ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2104	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	201	vph
Length of first accel/decel lane	175	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2104	201		vph
Peak-hour factor, PHF	0.94	0.70		
Peak 15-min volume, v15	560	72		v
Trucks and buses	16	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.926	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2417	290	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 2417 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2417	4700	No
$v_{FO} = v_F - v_R$	2127	4700	No
v_R	290	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2417$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2417	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 23.5 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.324$	
Space mean speed in ramp influence area,	$S_R = 57.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.5$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 4/11/2013
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Union Rd On Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2851	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	324	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2851	324		vph
Peak-hour factor, PHF	0.92	0.73		
Peak 15-min volume, v15	775	111		v
Trucks and buses	10	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3254	448	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 3254$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3702	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3254$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3702	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 29.1$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.407$	
Space mean speed in ramp influence area,	$S_R = 55.6$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 55.6$	mph

Phone: Fax:
E-mail:

----- Operational Analysis -----

Analyst:
Agency or Company: Fehr & Peers
Date Performed: 06/20/2014
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 EB
From/To: Yosemite Ave/Airport Way
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

----- Flow Inputs and Adjustments -----

Volume, V	3878	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1021	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2133	pc/h/ln

----- Speed Inputs and Adjustments -----

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

----- LOS and Performance Measures -----

Flow rate, vp	2133	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.4	mi/h
Number of lanes, N	2	
Density, D	37.2	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-mail:

----- Operational Analysis -----

Analyst:
Agency or Company: Fehr & Peers
Date Performed: 06/20/2014
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 WB
From/To: Airport Way/Yosemite Ave
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

----- Flow Inputs and Adjustments -----

Volume, V	2550	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	787	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1669	pc/h/ln

----- Speed Inputs and Adjustments -----

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

----- LOS and Performance Measures -----

Flow rate, vp	1669	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.0	mi/h
Number of lanes, N	2	
Density, D	26.1	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 06/20/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Airport Way Off Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3878	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	704	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3878	704		vph
Peak-hour factor, PHF	0.95	0.91		
Peak 15-min volume, v15	1021	193		v
Trucks and buses	9	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4266	781	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 4266 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4266	4700	No
$v_{FO} = v_F - v_R$	3485	4700	No
v_R	781	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4266$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4266	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 \frac{L}{D} = 39.6 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$D_S = 0.368$	
Space mean speed in ramp influence area,	$S_R = 56.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 56.5$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 06/20/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Airport On Ramp
Jurisdiction: District 10
Analysis Year: Exisiting Plus Project
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3174	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	508	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3174	508		vph
Peak-hour factor, PHF	0.95	0.82		
Peak 15-min volume, v15	835	155		v
Trucks and buses	9	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3491	629	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v (P) = 3491 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	4120	4700	No
FO			
v or v	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v or v	> 2700 pc/h?	No	
3 av34			
Is v or v	> 1.5 v /2	No	
3 av34	12		
If yes, v	= 3491	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	4120	4600	No
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 32.6 pc/mi/ln

R R 12 A

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M = 0.494	
	S	
Space mean speed in ramp influence area,	S = 53.6	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 53.6	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 06/20/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Airport Way Off Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2656	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	554	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2656	554		vph
Peak-hour factor, PHF	0.81	0.86		
Peak 15-min volume, v15	820	161		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3476	651	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 3476 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3476	4700	No
$v_{FO} = v_F - v_R$	2825	4700	No
v_R	651	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3476$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3476	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 32.8 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.357$	
Space mean speed in ramp influence area,	$S_R = 56.8$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 56.8$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 06/20/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Airport On Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2102	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	448	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2102	448		vph
Peak-hour factor, PHF	0.81	0.91		
Peak 15-min volume, v15	649	123		v
Trucks and buses	12	5		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.976	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2751	505	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 2751$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3256	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2751$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3256	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 25.9$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.355$	
Space mean speed in ramp influence area,	$S_R = 56.8$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 56.8$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 06/20/2013
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 EB
Junction: Union Rd Off Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3682	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	605	vph
Length of first accel/decel lane	175	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3682	605		vph
Peak-hour factor, PHF	0.95	0.92		
Peak 15-min volume, v15	969	164		v
Trucks and buses	9	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4050	664	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 4050$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4050	4700	No
$v_{FO} = v_F - v_R$	3386	4700	No
v_R	664	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4050$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4050	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 37.5$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$D_S = 0.358$	
Space mean speed in ramp influence area,	$S_R = 56.8$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 56.8$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Fehr & Peers
Date performed: 06/20/2013
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 WB
Junction: Union Rd On Ramp
Jurisdiction: District 10
Analysis Year: Existing Plus Project
Description: FEZ EIR

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2393	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	263	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2393	263		vph
Peak-hour factor, PHF	0.81	0.93		
Peak 15-min volume, v15	739	71		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3132	286	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 3132$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3418	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3132$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3418	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 27.0$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.368$	
Space mean speed in ramp influence area,	$S_R = 56.5$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 56.5$	mph

Major Street Airport Way
Minor Street Atherton Dr

Project FEZ EIR
Scenario Existing Plus Project
Peak Hour AM

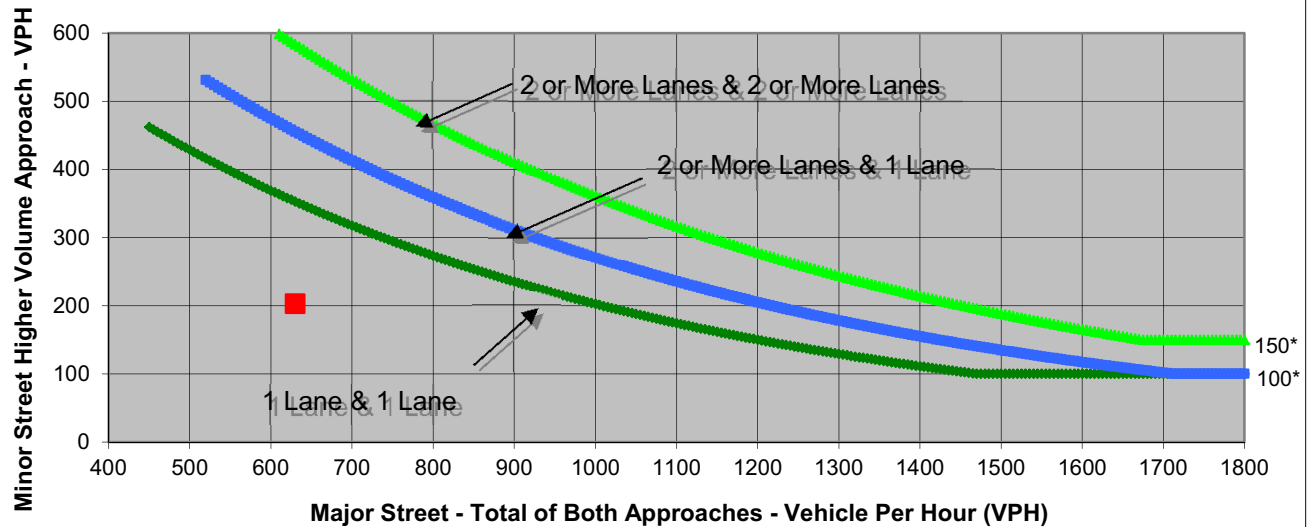
Turn Movement Volumes

	NB	SB	EB	WB
Left	3	48	197	6
Through	347	145	1	0
Right	4	90	5	99
Total	347	283	203	105

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Atherton Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	630	203	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Atherton Dr**

Project **FEZ EIR**
Scenario **Existing Plus Project**
Peak Hour **PM**

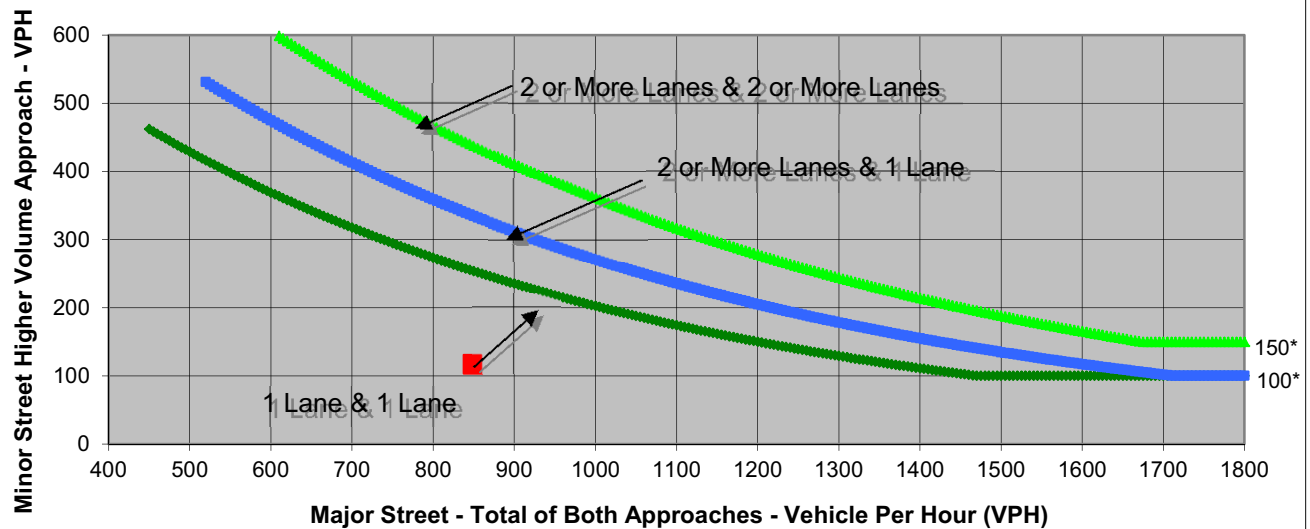
Turn Movement Volumes

	NB	SB	EB	WB
Left	5	96	110	2
Through	207	345	1	0
Right	8	201	6	69
Total	207	642	117	71

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Atherton Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	849	117	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Wawona Street**

Project **FEZ EIR**
Scenario **Existing Plus Project**
Peak Hour **AM**

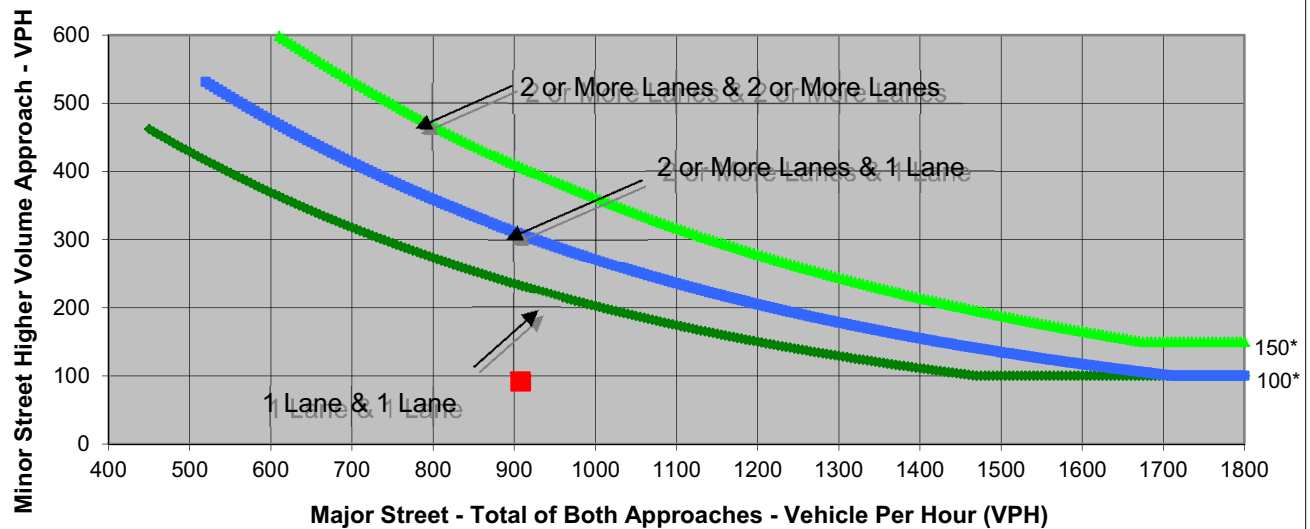
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	52	0	46
Through	390	374	0	0
Right	92	0	0	46
Total	482	426	0	92

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Wawona Street	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	908	92	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Wawona Street**

Project **FEZ EIR**
Scenario **ExistingPlus Project**
Peak Hour **PM**

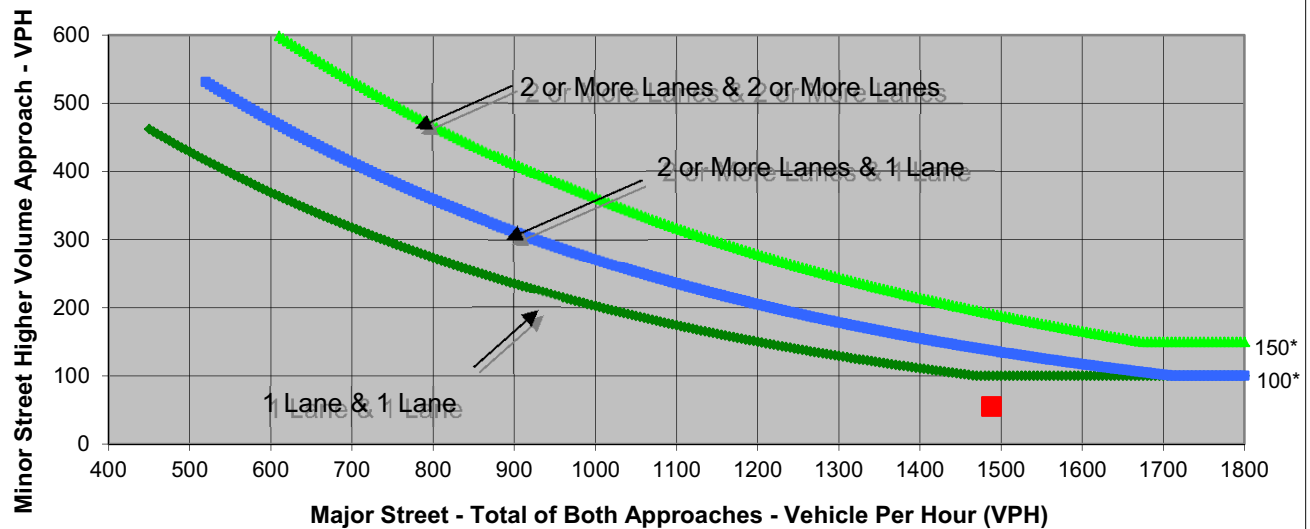
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	52	0	22
Through	715	657	0	0
Right	64	0	0	33
Total	779	709	0	55

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Wawona Street	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	1,488	55	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Yosemite Avenue
Minor Street McKinley Avenue

Project FEZ EIR
Scenario Existing Plus Project
Peak Hour AM

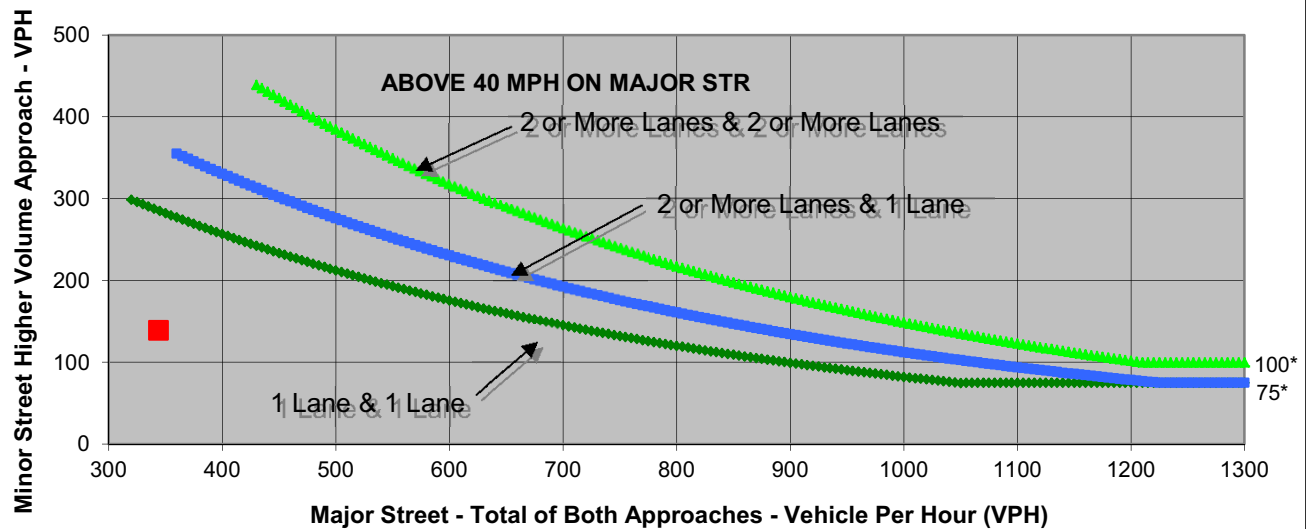
Turn Movement Volumes

	NB	SB	EB	WB
Left	33	97	14	9
Through	32	27	111	131
Right	9	15	12	67
Total	74	139	137	207

Major Street Direction

	North/South
X	East/West

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Yosemite Avenue	Minor Street McKinley Avenue	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	344	139	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Yosemite Avenue
Minor Street McKinley Avenue

Project FEZ EIR
Scenario Existing Plus Project
Peak Hour PM

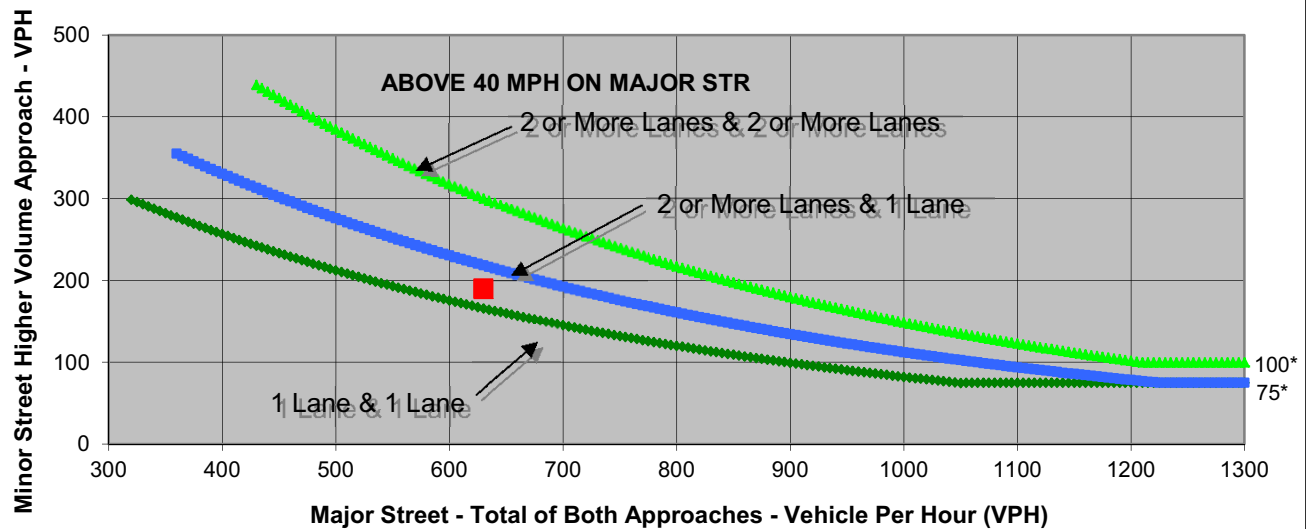
Turn Movement Volumes

	NB	SB	EB	WB
Left	18	130	24	27
Through	30	47	213	153
Right	15	13	53	160
Total	63	190	290	340

Major Street Direction

	North/South
X	East/West

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR



* Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Yosemite Avenue	Minor Street McKinley Avenue	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	630	190	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Intersection: 1: Atherton Drive & Airport Way

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	L	R	L	L
Maximum Queue (ft)	311	13	23	88	6	48
Average Queue (ft)	191	4	7	50	1	21
95th Queue (ft)	405	14	25	97	9	52
Link Distance (ft)	2452	2452		1338		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			340		210	175
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: SR 120 EB Ramps & Airport Way

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	R	T	R	L	T
Maximum Queue (ft)	338	47	328	184	181	131
Average Queue (ft)	229	27	218	102	97	66
95th Queue (ft)	376	54	352	233	190	141
Link Distance (ft)	1705		648			1414
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		700		160	240	
Storage Blk Time (%)			11	0		0
Queuing Penalty (veh)			22	1		0

Intersection: 3: SR 120 WB Ramps & Airport Way

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	T	T	R
Maximum Queue (ft)	100	311	206	449	184	131
Average Queue (ft)	57	181	105	235	105	68
95th Queue (ft)	105	322	200	464	192	142
Link Distance (ft)	1752			1414	395	395
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		490	225			
Storage Blk Time (%)			0	7		
Queuing Penalty (veh)			0	11		

Intersection: 4: Daniels St & Airport Way

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	L	T	R	L	L	T	TR
Maximum Queue (ft)	42	57	58	65	123	134	105	35	227	258	311	146
Average Queue (ft)	13	31	23	37	78	79	48	17	144	166	130	100
95th Queue (ft)	41	59	56	66	137	144	107	44	242	282	308	171
Link Distance (ft)		1318	1318				1515					395
Upstream Blk Time (%)												1
Queuing Penalty (veh)												10
Storage Bay Dist (ft)	215			310	165	165		260	200	200		125
Storage Blk Time (%)					0	0			3	5	5	6
Queuing Penalty (veh)					0	0			17	35	43	46

Intersection: 4: Daniels St & Airport Way

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	70	150	121	90
Average Queue (ft)	25	89	69	53
95th Queue (ft)	74	161	131	93
Link Distance (ft)		3899	3899	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	175		250	
Storage Blk Time (%)		1		
Queuing Penalty (veh)		0		

Network Summary

Network wide Queuing Penalty: 186

Intersection: 1: Atherton Drive & Airport Way

Movement	EB	EB	WB	WB	NB	NB	SB
Directions Served	LT	R	L	R	L	R	L
Maximum Queue (ft)	83	12	5	48	17	2	49
Average Queue (ft)	42	3	1	24	3	0	20
95th Queue (ft)	86	13	11	48	17	5	53
Link Distance (ft)	2452	2452		1338			
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			340		210	210	175
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: SR 120 WB Ramps & Airport Way

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	T	T	R
Maximum Queue (ft)	171	296	101	354	384	246
Average Queue (ft)	99	173	48	226	234	65
95th Queue (ft)	174	310	110	387	395	237
Link Distance (ft)	1752			1414	395	395
Upstream Blk Time (%)					1	0
Queuing Penalty (veh)					5	2
Storage Bay Dist (ft)		490	225			
Storage Blk Time (%)				6		
Queuing Penalty (veh)				4		

Intersection: 3: SR 120 EB Ramps & Airport Way

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	R	T	R	L	T
Maximum Queue (ft)	631	177	301	161	262	455
Average Queue (ft)	428	69	175	58	216	233
95th Queue (ft)	679	210	303	163	302	499
Link Distance (ft)	1705		648			1414
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		700		160	240	
Storage Blk Time (%)	1		8	0	8	1
Queuing Penalty (veh)	3		9	0	42	5

Intersection: 4: Daniels St & Airport Way

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	L	T	R	L	L	T	TR
Maximum Queue (ft)	204	223	161	265	114	100	145	32	245	287	274	145
Average Queue (ft)	129	149	84	154	68	49	84	10	171	191	135	104
95th Queue (ft)	205	225	161	265	121	114	155	34	269	306	305	166
Link Distance (ft)		1318	1318				1515				395	
Upstream Blk Time (%)												1
Queuing Penalty (veh)												12
Storage Bay Dist (ft)	215			310	165	165		260	200	200		125
Storage Blk Time (%)	0	1		0	1	1	0		4	8	3	4
Queuing Penalty (veh)	1	2		0	1	1	1		27	47	27	34

Intersection: 4: Daniels St & Airport Way

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	65	223	145	147
Average Queue (ft)	20	142	71	78
95th Queue (ft)	67	234	142	148
Link Distance (ft)		3899	3899	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	175			250
Storage Blk Time (%)		5	0	0
Queuing Penalty (veh)		1	0	0

Network Summary

Network wide Queuing Penalty: 224

Cumulative No Project Conditions Technical Calculations

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative No Project
AM Peak Hour

Intersection 1

Airport Way/Atherton Dr

Side Street Stop

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	3	2	66.7%	52.3	59.7	F
	Through	284	258	90.7%	69.9	35.6	F
	Right Turn	5	5	90.0%	33.4	29.5	D
	Subtotal	292	264	90.5%	69.3	35.4	F
SB	Left Turn	45	38	85.3%	115.7	82.9	F
	Through	63	60	95.1%	1.2	0.7	A
	Right Turn	42	39	92.4%	1.1	0.3	A
	Subtotal	150	137	91.4%	33.7	23.7	D
EB	Left Turn	84	1	0.7%	2570.2	782.5	F
	Through	3	0	0.0%	0.0	0.0	A
	Right Turn	3	0	6.7%	159.2	263.9	F
	Subtotal	90	1	0.9%	2575.2	2408.5	F
WB	Left Turn	5	2	42.0%	871.0	675.3	F
	Through	11	2	20.0%	1131.2	583.9	F
	Right Turn	79	61	76.6%	192.7	147.9	F
	Subtotal	95	65	68.2%	221.1	140.6	F
Total		627	467	74.5%	83.1	23.4	F

Intersection 2

Airport Way/SR120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	321	230	71.6%	62.8	7.9	E
	Right Turn	126	96	75.8%	11.1	3.9	B
	Subtotal	447	325	72.8%	47.7	6.2	D
SB	Left Turn	42	33	77.6%	204.5	125.6	F
	Through	118	106	89.9%	50.9	69.4	D
	Right Turn						
	Subtotal	160	139	86.7%	89.1	87.6	F
EB	Left Turn	121	82	67.6%	340.6	64.6	F
	Through	3	1	46.7%	411.2	191.3	F
	Right Turn	32	28	86.9%	132.3	48.1	F
	Subtotal	156	111	71.2%	287.3	55.0	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		763	575	75.4%	101.4	18.6	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative No Project
AM Peak Hour

Intersection 3

Airport Way/SR120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	150	105	70.3%	74.9	13.5	E
	Through	292	201	68.8%	49.4	11.5	D
	Right Turn						
	Subtotal	442	306	69.3%	58.2	12.5	E
SB	Left Turn						
	Through	116	111	95.5%	46.5	12.6	D
	Right Turn	116	118	101.7%	18.2	3.0	B
	Subtotal	232	229	98.6%	32.0	6.9	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	45	40	89.8%	44.7	17.3	D
	Through	3	3	86.7%	45.3	11.7	D
	Right Turn	121	121	99.9%	20.2	5.5	C
	Subtotal	169	164	97.0%	26.6	5.7	C
Total		843	699	82.9%	42.1	4.9	D

Intersection 4

Airport Way/Daniels St

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	71	54	76.2%	39.0	4.1	D
	Through	224	169	75.4%	21.1	3.5	C
	Right Turn	118	94	79.8%	5.9	0.6	A
	Subtotal	413	317	76.8%	19.6	2.5	B
SB	Left Turn	37	35	95.7%	50.7	13.2	D
	Through	105	104	98.6%	22.4	3.7	C
	Right Turn	18	18	97.8%	6.4	1.1	A
	Subtotal	160	157	97.8%	27.1	5.3	C
EB	Left Turn	13	12	94.6%	39.2	9.4	D
	Through	8	8	101.3%	33.2	10.3	C
	Right Turn	47	46	97.9%	14.2	9.3	B
	Subtotal	68	66	97.6%	21.5	6.6	C
WB	Left Turn	79	78	99.2%	60.2	15.7	E
	Through	29	29	99.0%	16.4	3.9	B
	Right Turn						
	Subtotal	108	107	99.2%	48.4	11.0	D
Total		749	647	86.4%	26.5	3.5	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative No Project
AM Peak Hour

Intersection 9

McKinley Ave/SR120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	526	521	99.1%	18.3	4.3	B
	Right Turn	113	110	97.3%	6.2	0.8	A
	Subtotal	639	631	98.8%	16.2	3.7	B
SB	Left Turn						
	Through	74	74	100.0%	7.8	2.4	A
	Right Turn	53	56	104.7%	3.4	0.6	A
	Subtotal	127	130	102.0%	5.9	1.5	A
EB	Left Turn	26	26	100.4%	27.7	3.4	C
	Through	3	3	103.3%	31.5	30.5	C
	Right Turn	158	157	99.6%	15.8	1.4	B
	Subtotal	187	187	99.7%	17.6	1.3	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		953	947	99.4%	15.1	2.5	B

Intersection 10

McKinley Way/SR120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	92	93	101.4%	9.4	1.2	A
	Right Turn	461	453	98.3%	18.2	3.7	B
	Subtotal	553	547	98.8%	16.7	3.2	B
SB	Left Turn						
	Through	76	78	102.8%	3.7	0.9	A
	Right Turn	8	9	116.3%	0.8	0.4	A
	Subtotal	84	87	104.0%	3.4	0.8	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	50	49	98.0%	28.2	4.1	C
	Through	3	3	83.3%	38.3	17.1	D
	Right Turn	224	217	96.9%	9.5	1.4	A
	Subtotal	277	269	96.9%	13.1	1.2	B
Total		914	903	98.7%	14.4	2.0	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative No Project
PM Peak Hour

Intersection 1

Airport Way/Atherton Dr

Side Street Stop

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	3	3	96.7%	10.0	7.9	A
	Through	97	102	104.9%	1.7	3.0	A
	Right Turn	5	5	98.0%	0.4	0.4	A
	Subtotal	105	110	104.4%	1.9	2.9	A
SB	Left Turn	79	60	75.9%	7.3	1.4	A
	Through	282	203	72.1%	1.3	0.1	A
	Right Turn	74	45	61.2%	1.5	0.3	A
	Subtotal	435	309	71.0%	2.5	0.3	A
EB	Left Turn	58	14	24.0%	1099.7	150.9	F
	Through	5	2	32.0%	1193.1	489.4	F
	Right Turn	3	1	40.0%	595.5	445.4	F
	Subtotal	66	17	25.3%	1067.3	158.4	F
WB	Left Turn	13	13	100.8%	59.3	31.3	F
	Through	18	15	85.0%	373.6	201.2	F
	Right Turn	53	51	95.7%	11.0	14.8	B
	Subtotal	84	79	94.2%	86.5	34.8	F
Total		690	514	74.5%	49.4	11.7	E

Intersection 2

Airport Way/SR120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	147	119	80.6%	62.2	24.8	E
	Right Turn	61	51	83.8%	7.1	1.6	A
	Subtotal	208	170	81.5%	46.0	19.5	D
SB	Left Turn	126	79	62.9%	104.4	27.6	F
	Through	289	178	61.7%	66.4	25.2	E
	Right Turn						
	Subtotal	415	258	62.1%	78.0	25.3	E
EB	Left Turn	166	115	69.4%	181.7	60.2	F
	Through	3	2	56.7%	163.3	96.5	F
	Right Turn	145	123	84.8%	76.3	30.6	E
	Subtotal	314	240	76.4%	128.0	45.2	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		937	667	71.2%	87.0	23.8	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative No Project
PM Peak Hour

Intersection 3

Airport Way/SR120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	45	29	65.3%	176.8	62.1	F
	Through	268	188	70.0%	86.1	32.6	F
	Right Turn						
	Subtotal	313	217	69.3%	98.9	32.2	F
SB	Left Turn						
	Through	308	198	64.3%	28.6	8.5	C
	Right Turn	161	116	71.9%	6.9	2.0	A
	Subtotal	469	314	66.9%	20.5	5.5	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	108	66	61.5%	332.4	80.7	F
	Through	3	2	73.3%	300.8	147.1	F
	Right Turn	124	72	58.0%	358.6	247.3	F
	Subtotal	235	141	59.8%	346.4	168.3	F
Total		1,017	671	66.0%	104.5	13.7	F

Intersection 4

Airport Way/Daniels St

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	153	98	64.3%	164.7	22.2	F
	Through	147	93	63.3%	39.9	5.2	D
	Right Turn	92	60	65.7%	5.8	1.1	A
	Subtotal	392	252	64.3%	80.8	10.5	F
SB	Left Turn	24	17	70.0%	336.8	86.9	F
	Through	208	135	65.0%	288.2	82.2	F
	Right Turn	68	56	82.4%	171.7	71.5	F
	Subtotal	300	208	69.4%	260.5	78.2	F
EB	Left Turn	84	82	97.7%	39.3	15.8	D
	Through	29	25	87.2%	81.3	60.1	F
	Right Turn	145	132	90.8%	119.0	98.4	F
	Subtotal	258	239	92.6%	86.1	59.6	F
WB	Left Turn	116	40	34.8%	1511.9	1616.3	F
	Through	76	27	35.0%	739.2	604.3	F
	Right Turn						
	Subtotal	192	67	34.9%	1322.2	1479.2	F
Total		1,142	766	67.1%	188.5	22.6	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative No Project
PM Peak Hour

Intersection 9

McKinley Ave/SR120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	263	263	99.9%	14.4	1.9	B
	Right Turn	82	87	105.9%	2.5	0.4	A
	Subtotal	345	350	101.3%	11.4	1.5	B
SB	Left Turn						
	Through	195	193	98.8%	33.0	5.2	C
	Right Turn	200	200	99.9%	11.9	0.9	B
	Subtotal	395	392	99.3%	22.3	2.9	C
EB	Left Turn	11	11	102.7%	17.8	4.3	B
	Through	3	3	96.7%	12.3	9.3	B
	Right Turn	482	487	101.0%	16.8	1.3	B
	Subtotal	496	501	101.0%	16.8	1.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,236	1,243	100.6%	17.1	1.1	B

Intersection 10

McKinley Way/SR120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	42	43	101.4%	8.5	1.2	A
	Right Turn	232	233	100.5%	10.2	0.7	B
	Subtotal	274	276	100.6%	9.9	0.6	A
SB	Left Turn						
	Through	274	273	99.6%	13.6	1.8	B
	Right Turn	34	33	97.1%	4.5	0.7	A
	Subtotal	308	306	99.3%	12.6	1.6	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	121	120	99.4%	21.3	2.5	C
	Through	3	3	103.3%	20.4	8.3	C
	Right Turn	74	74	100.1%	2.1	0.6	A
	Subtotal	198	198	99.7%	14.1	1.6	B
Total		780	779	99.9%	12.0	0.7	B

HCM Unsignalized Intersection Capacity Analysis 5: Wawona St. & Airport Way

Cumulative No Project
AM Peak Hour

							
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Volume (veh/h)	50	50	790	130	60	450	
Sign Control	Stop		Free		Free	Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	
Hourly flow rate (vph)	60	60	952	157	72	542	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type			None		None		
Median storage veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	1367	476			1108		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1367	476			1108		
tC, single (s)	6.8	6.9			4.2		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	50	89			88		
cM capacity (veh/h)	122	535			609		
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	120	476	476	157	72	271	271
Volume Left	60	0	0	0	72	0	0
Volume Right	60	0	0	157	0	0	0
cSH	198	1700	1700	1700	609	1700	1700
Volume to Capacity	0.61	0.28	0.28	0.09	0.12	0.16	0.16
Queue Length 95th (ft)	86	0	0	0	10	0	0
Control Delay (s)	47.9	0.0	0.0	0.0	11.7	0.0	0.0
Lane LOS	E				B		
Approach Delay (s)	47.9	0.0			1.4		
Approach LOS	E						
Intersection Summary							
Average Delay			3.6				
Intersection Capacity Utilization			41.0%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Signalized Intersection Capacity Analysis

6: Yosemite Avenue & Airport Way

Cumulative No Project
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	270	50	70	320	200	60	600	150	310	420	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.3	5.3		5.3	5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Flt Protected	1.00	0.98		1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1626	3420		1687	3310		1703	3360		1770	3505	1538
Satd. Flow (perm)	1626	3420		1687	3310		1703	3360		1770	3505	1538
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	67	303	56	79	360	225	67	674	169	348	472	461
RTOR Reduction (vph)	0	11	0	0	73	0	0	16	0	0	0	191
Lane Group Flow (vph)	67	348	0	79	512	0	67	827	0	348	472	270
Heavy Vehicles (%)	11%	2%	9%	7%	2%	4%	6%	5%	1%	2%	3%	5%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	6.1	20.3		8.1	22.3		7.6	36.0		27.1	55.5	55.5
Effective Green, g (s)	6.1	20.3		8.1	22.3		7.6	36.0		27.1	55.5	55.5
Actuated g/C Ratio	0.05	0.18		0.07	0.20		0.07	0.32		0.24	0.49	0.49
Clearance Time (s)	5.7	5.7		5.7	5.7		5.3	5.3		5.3	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	87	612		120	650		114	1066		423	1714	752
v/s Ratio Prot	0.04	0.10		c0.05	c0.15		0.04	c0.25		c0.20	0.13	
v/s Ratio Perm												0.18
v/c Ratio	0.77	0.57		0.66	0.79		0.59	0.78		0.82	0.28	0.36
Uniform Delay, d1	53.0	42.6		51.4	43.3		51.4	35.1		40.9	17.1	18.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	33.4	1.2		12.3	6.3		7.5	3.6		12.2	0.1	0.3
Delay (s)	86.4	43.8		63.7	49.6		59.0	38.7		53.1	17.2	18.3
Level of Service	F	D		E	D		E	D		D	B	B
Approach Delay (s)		50.5			51.3			40.2			27.3	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM Average Control Delay			38.8			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			113.5			Sum of lost time (s)			16.3			
Intersection Capacity Utilization			75.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: Yosemite Ave & McKinley Ave

Cumulative No Project

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	170	60	340	370	70	140	180	50	160	510	140
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	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1444	3085	1509	1770	2935	1583	1736	1863	1583	1641	1863	1429
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1444	3085	1509	1770	2935	1583	1736	1863	1583	1641	1863	1429
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	179	63	358	389	74	147	189	53	168	537	147
RTOR Reduction (vph)	0	0	53	0	0	48	0	0	39	0	0	77
Lane Group Flow (vph)	21	179	10	358	389	26	147	189	14	168	537	70
Heavy Vehicles (%)	25%	17%	7%	2%	23%	2%	4%	2%	2%	10%	2%	13%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	2.2	13.0	13.0	19.3	30.1	30.1	9.1	23.0	23.0	13.1	27.0	27.0
Effective Green, g (s)	2.2	13.0	13.0	19.3	30.1	30.1	9.1	23.0	23.0	13.1	27.0	27.0
Actuated g/C Ratio	0.03	0.15	0.15	0.23	0.36	0.36	0.11	0.27	0.27	0.16	0.32	0.32
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	38	475	232	405	1047	565	187	508	431	255	596	457
v/s Ratio Prot	0.01	0.06		c0.20	c0.13		c0.08	0.10		0.10	c0.29	
v/s Ratio Perm			0.01			0.02			0.01			0.05
v/c Ratio	0.55	0.38	0.04	0.88	0.37	0.05	0.79	0.37	0.03	0.66	0.90	0.15
Uniform Delay, d1	40.6	32.1	30.4	31.5	20.1	17.8	36.7	24.9	22.5	33.5	27.4	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.2	0.5	0.1	19.8	0.2	0.0	19.2	0.5	0.0	6.0	16.8	0.2
Delay (s)	56.9	32.6	30.5	51.3	20.4	17.8	55.9	25.3	22.6	39.6	44.2	20.7
Level of Service	E	C	C	D	C	B	E	C	C	D	D	C
Approach Delay (s)		34.0			33.6			36.5			39.2	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay			36.2			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			84.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			71.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Daniels Street & Milo Candini Drive

Cumulative No Project
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	80	0	30	90	20	10	0	20	10	10	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		4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00		1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.97		1.00		0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539		1770	3443		1770		1583	1770	1863	
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539		1770	3443		1770		1583	1770	1863	
Peak-hour factor, PHF	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Adj. Flow (vph)	13	105	0	39	118	26	13	0	26	13	13	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	0	22	0	0	0
Lane Group Flow (vph)	13	105	0	39	127	0	13	0	4	13	13	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)	0.4	7.0		0.7	7.3		4.0		4.0	1.9	1.9	
Effective Green, g (s)	0.4	7.0		0.7	7.3		4.0		4.0	1.9	1.9	
Actuated g/C Ratio	0.01	0.24		0.02	0.25		0.14		0.14	0.06	0.06	
Clearance Time (s)	4.0	4.0		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	3.0	3.0	
Lane Grp Cap (vph)	24	837		42	849		239		214	114	120	
v/s Ratio Prot	0.01	0.03		c0.02	c0.04		c0.01			c0.01	0.01	
v/s Ratio Perm									0.00			
v/c Ratio	0.54	0.13		0.93	0.15		0.05		0.02	0.11	0.11	
Uniform Delay, d1	14.5	8.9		14.4	8.7		11.2		11.1	13.1	13.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	22.7	0.1		109.9	0.1		0.1		0.0	0.4	0.4	
Delay (s)	37.2	9.0		124.3	8.8		11.2		11.1	13.5	13.5	
Level of Service	D	A		F	A		B		B	B	B	
Approach Delay (s)		12.1			33.4			11.2			13.5	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM Average Control Delay			22.8			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.12									
Actuated Cycle Length (s)			29.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			22.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Wawona St. & Airport Way

Cumulative No Project Conditions
PM Peak Hour

							
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Volume (veh/h)	70	40	880	70	60	1040	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	76	43	957	76	65	1130	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type			None			None	
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	1652	478			1033		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1652	478			1033		
tC, single (s)	6.8	6.9			4.1		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	6	92			90		
cM capacity (veh/h)	81	533			669		
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	120	478	478	76	65	565	565
Volume Left	76	0	0	0	65	0	0
Volume Right	43	0	0	76	0	0	0
cSH	117	1700	1700	1700	669	1700	1700
Volume to Capacity	1.03	0.28	0.28	0.04	0.10	0.33	0.33
Queue Length 95th (ft)	172	0	0	0	8	0	0
Control Delay (s)	161.0	0.0	0.0	0.0	11.0	0.0	0.0
Lane LOS	F				B		
Approach Delay (s)	161.0	0.0			0.6		
Approach LOS	F						
Intersection Summary							
Average Delay		8.5					
Intersection Capacity Utilization		44.0%		ICU Level of Service		A	
Analysis Period (min)		15					

HCM Signalized Intersection Capacity Analysis

6: Yosemite Avenue & Airport Way

Cumulative No Project Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	480	510	140	230	300	240	50	690	250	180	720	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.3	5.3		5.3	5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.93		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1687	3425		1770	3303		1626	3398		1770	3539	1495
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1687	3425		1770	3303		1626	3398		1770	3539	1495
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	527	560	154	253	330	264	55	758	275	198	791	154
RTOR Reduction (vph)	0	19	0	0	110	0	0	27	0	0	0	47
Lane Group Flow (vph)	527	695	0	253	484	0	55	1006	0	198	791	107
Heavy Vehicles (%)	7%	2%	2%	2%	2%	2%	11%	2%	2%	2%	2%	8%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	35.3	37.0		21.6	23.3		5.3	39.2		12.7	46.6	46.6
Effective Green, g (s)	35.3	37.0		21.6	23.3		5.3	39.2		12.7	46.6	46.6
Actuated g/C Ratio	0.27	0.28		0.16	0.18		0.04	0.30		0.10	0.35	0.35
Clearance Time (s)	5.7	5.7		5.7	5.7		5.3	5.3		5.3	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	449	956		289	581		65	1005		170	1245	526
v/s Ratio Prot	c0.31	0.20		0.14	c0.15		0.03	c0.30		c0.11	0.22	
v/s Ratio Perm												0.07
v/c Ratio	1.17	0.73		0.88	0.83		0.85	1.00		1.16	0.64	0.20
Uniform Delay, d1	48.6	43.2		54.1	52.7		63.2	46.6		59.9	35.9	30.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	99.5	2.8		24.2	10.0		60.5	28.7		120.3	1.1	0.2
Delay (s)	148.1	46.0		78.3	62.7		123.7	75.3		180.2	36.9	30.2
Level of Service	F	D		E	E		F	E		F	D	C
Approach Delay (s)		89.3			67.4			77.8			60.8	
Approach LOS		F			E			E			E	
Intersection Summary												
HCM Average Control Delay			74.6			HCM Level of Service				E		
HCM Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			132.5			Sum of lost time (s)			22.0			
Intersection Capacity Utilization			98.0%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: Yosemite Ave & McKinley Ave

Cumulative No Project Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	460	180	90	250	180	20	590	400	140	270	50
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	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1228	3223	1583	1736	3112	1583	1770	1792	1583	1770	1863	1429
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1228	3223	1583	1736	3112	1583	1770	1792	1583	1770	1863	1429
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)	210	568	222	111	309	222	25	728	494	173	333	62
RTOR Reduction (vph)	0	0	172	0	0	187	0	0	181	0	0	32
Lane Group Flow (vph)	210	568	50	111	309	35	25	728	313	173	333	30
Heavy Vehicles (%)	47%	12%	2%	4%	16%	2%	2%	6%	2%	2%	2%	13%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.0	20.3	20.3	7.8	14.1	14.1	2.4	38.5	38.5	8.0	44.1	44.1
Effective Green, g (s)	14.0	20.3	20.3	7.8	14.1	14.1	2.4	38.5	38.5	8.0	44.1	44.1
Actuated g/C Ratio	0.15	0.22	0.22	0.09	0.16	0.16	0.03	0.42	0.42	0.09	0.49	0.49
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	190	722	355	149	484	246	47	762	673	156	907	696
v/s Ratio Prot	c0.17	c0.18		0.06	0.10		0.01	c0.41		c0.10	0.18	
v/s Ratio Perm			0.03			0.02			0.20			0.02
v/c Ratio	1.11	0.79	0.14	0.74	0.64	0.14	0.53	0.96	0.46	1.11	0.37	0.04
Uniform Delay, d1	38.3	33.1	28.2	40.4	35.9	33.0	43.5	25.2	18.7	41.3	14.5	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	96.3	5.7	0.2	18.2	2.8	0.3	11.1	22.1	0.5	104.3	0.3	0.0
Delay (s)	134.6	38.8	28.3	58.6	38.6	33.3	54.6	47.4	19.2	145.6	14.8	12.2
Level of Service	F	D	C	E	D	C	D	D	B	F	B	B
Approach Delay (s)		56.6			40.2			36.3			54.3	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM Average Control Delay			45.9			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			90.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			69.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Daniels Street & Milo Candini Drive

Cumulative No Project Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	440	10	90	70	390	10	10	80	30	10	10
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		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.87		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3527		1770	3089		1770	1863	1583	1770	1723	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3527		1770	3089		1770	1863	1583	1770	1723	
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)	11	473	11	97	75	419	11	11	86	32	11	11
RTOR Reduction (vph)	0	1	0	0	227	0	0	0	77	0	10	0
Lane Group Flow (vph)	11	483	0	97	267	0	11	11	9	32	12	0
Turn Type	Prot			Prot			Split			Perm		Split
Protected Phases	7	4		3	8		2	2			6	6
Permitted Phases									2			
Actuated Green, G (s)	0.5	15.1		8.5	23.1		5.4	5.4	5.4	5.5	5.5	
Effective Green, g (s)	0.5	15.1		8.5	23.1		5.4	5.4	5.4	5.5	5.5	
Actuated g/C Ratio	0.01	0.30		0.17	0.46		0.11	0.11	0.11	0.11	0.11	
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	18	1055		298	1413		189	199	169	193	188	
v/s Ratio Prot	0.01	c0.14		c0.05	0.09		c0.01	0.01		c0.02	0.01	
v/s Ratio Perm									0.01			
v/c Ratio	0.61	0.46		0.33	0.19		0.06	0.06	0.05	0.17	0.06	
Uniform Delay, d1	24.9	14.4		18.5	8.1		20.3	20.3	20.3	20.4	20.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	48.7	0.3		0.6	0.1		0.1	0.1	0.1	0.4	0.1	
Delay (s)	73.6	14.7		19.1	8.2		20.4	20.4	20.4	20.8	20.3	
Level of Service	E	B		B	A		C	C	C	C	C	
Approach Delay (s)		16.0			10.0			20.4			20.6	
Approach LOS		B			A			C			C	
Intersection Summary												
HCM Average Control Delay			13.7			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			50.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			36.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: McKinley Ave off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3951	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	710	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane	800	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	201	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3951	710	201	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1040	187	53	v
Trucks and buses	10	5	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.976	0.976	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4367	766	217	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 13-12 or 13-13)}$$

$$EQ$$

$$P = 0.450 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2386 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4367	7050	No
$v_{FO} = v_F - v_R$	3601	7050	No
v_R	766	4200	No
v_3 or v_{av34}	1981 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 2495$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2495	4400	No

Level of Service Determination (if not F)

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 14.0$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence B			

Speed Estimation

Intermediate speed variable,	$D_S = 0.302$	
Space mean speed in ramp influence area,	$S_R = 58.1$	mph
Space mean speed in outer lanes,	$S_0 = 67.9$	mph
Space mean speed for all vehicles,	$S = 61.9$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: McKinley Ave slip on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5363	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	40	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1101	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5363	40	1101	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1411	11	290	v
Trucks and buses	10	5	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.976	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5928	43	1217	pcph

Estimation of V12 Merge Areas

$$L = 7002.30 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.663 \text{ Using Equation 3}$$

FM

$$v_{12} = v_F (P_{FM}) = 3930 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	5971	7050	No
v ₃ or v _{av34}	1998 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ /2		No	
If yes, v _{12A} = 3930		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{R12}	3973	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 32.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M _S = 0.468	
Space mean speed in ramp influence area,	S _R = 54.2	mph
Space mean speed in outer lanes,	S ₀ = 59.6	mph
Space mean speed for all vehicles,	S = 55.9	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: Airport Way on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3291	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	650	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	692	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2230	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3291	650	692	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	866	171	182	v
Trucks and buses	10	4	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.980	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3637	698	736	pcph

Estimation of V12 Merge Areas

$$L = 4234.75 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.635 \text{ Using Equation 3}$$

FM

$$v_{12} = v_F (P_{FM}) = 2311 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4335	7050	No
v_3 or v_{av34}	1326 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2311$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3009	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 24.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.340$	
Space mean speed in ramp influence area,	$S_R = 57.2$	mph
Space mean speed in outer lanes,	$S_0 = 62.0$	mph
Space mean speed for all vehicles,	$S = 58.6$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: Airport Way off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4283	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	640	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	693	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2350	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4283	640	693	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1127	168	182	v
Trucks and buses	10	4	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.980	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4734	687	737	pcph

Estimation of V12 Diverge Areas

$$L = 5772.69 \text{ (Equation 13-12 or 13-13)}$$

$$EQ$$

$$P = 0.610 \text{ Using Equation 5}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3156 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4734	7050	No
$v_{FO} = v_F - v_R$	4047	7050	No
v_R	687	2100	No
$v_3 \text{ or } v_{av34}$	1578 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3156$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3156	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 L_D = 30.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.295$	
Space mean speed in ramp influence area,	$S_R = 58.2$	mph
Space mean speed in outer lanes,	$S_0 = 69.1$	mph
Space mean speed for all vehicles,	$S = 61.4$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: Union Rd off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3941	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	692	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	650	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2230	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3941	692	650	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1037	182	171	v
Trucks and buses	10	2	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.980	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4356	736	698	pcph

Estimation of V12 Diverge Areas

$$L = 6056.29 \text{ (Equation 13-12 or 13-13)}$$

$$EQ$$

$$P = 0.617 \text{ Using Equation 5}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2970 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4356	7050	No
$v_{FO} = v_F - v_R$	3620	7050	No
v_R	736	2100	No
$v_3 \text{ or } v_{av34}$	1386 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2970$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2970	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 L_D = 16.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.299$	
Space mean speed in ramp influence area,	$S_R = 58.1$	mph
Space mean speed in outer lanes,	$S_0 = 69.8$	mph
Space mean speed for all vehicles,	$S = 61.4$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: Union Rd slip on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Mnateca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3590	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	693	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	640	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2350	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3590	693	640	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	945	182	168	v
Trucks and buses	10	2	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.980	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3968	737	687	pcph

Estimation of V12 Merge Areas

$$L = 3519.47 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.626 \text{ Using Equation 3}$$

FM

$$v_{12} = v_F (P_{FM}) = 2482 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	4705	7050	No
v ₃ or v _{av34}	1486 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ /2		Yes	
If yes, v _{12A} = 2482		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	3219	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 25.2 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M _S = 0.339	
Space mean speed in ramp influence area,	S _R = 57.2	mph
Space mean speed in outer lanes,	S ₀ = 61.5	mph
Space mean speed for all vehicles,	S = 58.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: McKinley Ave off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5712	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1880	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane	800	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1092	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5712	1880	1092	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1503	495	287	v
Trucks and buses	10	3	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.985	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6313	2009	1195	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 13-12 or 13-13)}$$

$$EQ$$

$$P = 0.450 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3946 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6313	7050	No
$v_{FO} = v_F - v_R$	4304	7050	No
v_R	2009	4200	No
$v_3 \text{ or } v_{av34}$	2367 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3946$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3946	4400	No

Level of Service Determination (if not F)

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 26.5$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence C			

Speed Estimation

Intermediate speed variable,	$D_S = 0.414$	
Space mean speed in ramp influence area,	$S_R = 55.5$	mph
Space mean speed in outer lanes,	$S_0 = 66.0$	mph
Space mean speed for all vehicles,	$S = 59.0$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: McKinley Ave slip on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4534	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	140	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	356	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4534	140	356	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1193	37	94	v
Trucks and buses	10	3	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.985	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5011	150	393	pcph

Estimation of V12 Merge Areas

$$L = 2261.22 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.594 \text{ Using Equation 1}$$

FM

$$v_{12} = v_F (P_{FM}) = 2978 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	5161	7050	No
v ₃ or v _{av34}	2033 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} = 2978		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{R12}	3128	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 26.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M _S = 0.350	
Space mean speed in ramp influence area,	S _R = 56.9	mph
Space mean speed in outer lanes,	S ₀ = 59.5	mph
Space mean speed for all vehicles,	S = 57.9	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: Airport Way on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3722	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	720	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1536	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2230	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3722	720	1536	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	979	189	404	v
Trucks and buses	10	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4114	765	1633	pcph

Estimation of V12 Merge Areas

$$L = 9395.86 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.741 \text{ Using Equation 3}$$

FM

$$v_{12} = v_F (P_{FM}) = 3049 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	4879	7050	No
v ₃ or v _{av34}	1065 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ /2		No	
If yes, v _{12A} = 3049		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{R12}	3814	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 31.1 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M _S = 0.438	
Space mean speed in ramp influence area,	S _R = 54.9	mph
Space mean speed in outer lanes,	S ₀ = 63.0	mph
Space mean speed for all vehicles,	S = 56.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: Airport Way off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4504	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	890	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	395	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2550	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4504	890	395	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1185	234	104	v
Trucks and buses	10	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4978	946	420	pcph

Estimation of V12 Diverge Areas

$$L = 3697.25 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.622 \text{ Using Equation 6}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3455 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4978	7050	No
$v_{FO} = v_F - v_R$	4032	7050	No
v_R	946	2100	No
$v_3 \text{ or } v_{av34}$	1523 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3455$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3455	4400	No

Level of Service Determination (if not F)

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 32.6$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence D			

Speed Estimation

Intermediate speed variable,	$D_S = 0.318$	
Space mean speed in ramp influence area,	$S_R = 57.7$	mph
Space mean speed in outer lanes,	$S_0 = 69.3$	mph
Space mean speed for all vehicles,	$S = 60.8$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: Union Rd off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4442	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1536	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	720	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2230	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	4442		1536		720	vph
Peak-hour factor, PHF	0.95		0.95		0.95	
Peak 15-min volume, v15	1169		404		189	v
Trucks and buses	10		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4910	1633	765	pcph

Estimation of V12 Diverge Areas

$$L = 12787.94 \text{ Equation 13-12 or 13-13}$$

$$EQ$$

$$P = 0.562 \text{ Using Equation 5}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 3475 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4910	7050	No
$v_{FO} = v_F - v_R$	3277	7050	No
v_R	1633	2100	No
$v_3 \text{ or } v_{av34}$	1435 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3475$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3475	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 L_D = 20.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.380$	
Space mean speed in ramp influence area,	$S_R = 56.3$	mph
Space mean speed in outer lanes,	$S_0 = 69.6$	mph
Space mean speed for all vehicles,	$S = 59.6$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: Union Rd slip on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative No Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4109	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	395	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	890	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2350	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4109	395	890	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1081	104	234	v
Trucks and buses	10	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4542	420	946	pcph

Estimation of V12 Merge Areas

$$L = 4846.31 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.654 \text{ Using Equation 3}$$

FM

$$v_{12} = v_F (P) = 2973 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4962	7050	No
v_3 or v_{av34}	1569 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 2973$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3393	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 26.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.357$	
Space mean speed in ramp influence area,	$S_R = 56.8$	mph
Space mean speed in outer lanes,	$S_0 = 61.2$	mph
Space mean speed for all vehicles,	$S = 58.1$	mph

Major Street **Airport Way**
Minor Street **Atherton Dr**

Project **FEZ EIR**
Scenario **Cumulative No Project**
Peak Hour **AM**

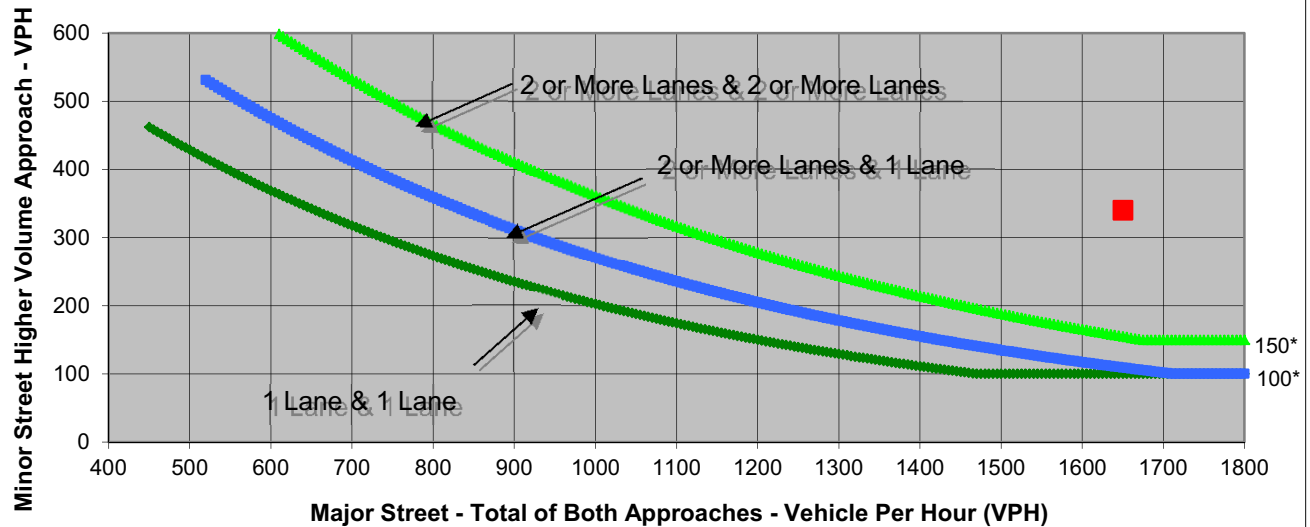
Turn Movement Volumes

	NB	SB	EB	WB
Left	10	170	320	20
Through	1,080	240	10	40
Right	20	160	10	210
Total	1,080	570	340	270

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Atherton Dr	Warrant Met
Number of Approach Lanes	2	2	<u>YES</u>
Traffic Volume (VPH) *	1,650	340	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Atherton Dr**

Project **FEZ EIR**
Scenario **Cumulative No Project**
Peak Hour **PM**

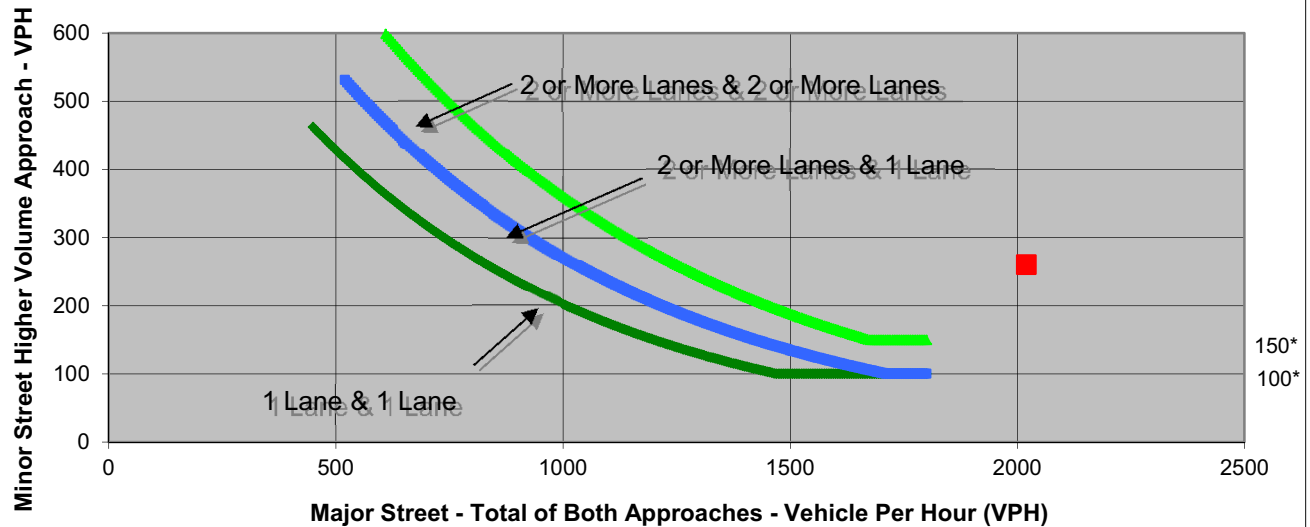
Turn Movement Volumes

	NB	SB	EB	WB
Left	10	300	220	50
Through	370	1,070	20	70
Right	20	280	10	140
Total	370	1,650	250	260

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Atherton Dr	Warrant Met
Number of Approach Lanes	2	2	<u>YES</u>
Traffic Volume (VPH) *	2,020	260	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Wawona Street**

Project **FEZ EIR**
Scenario **Cumulative No Project**
Peak Hour **AM**

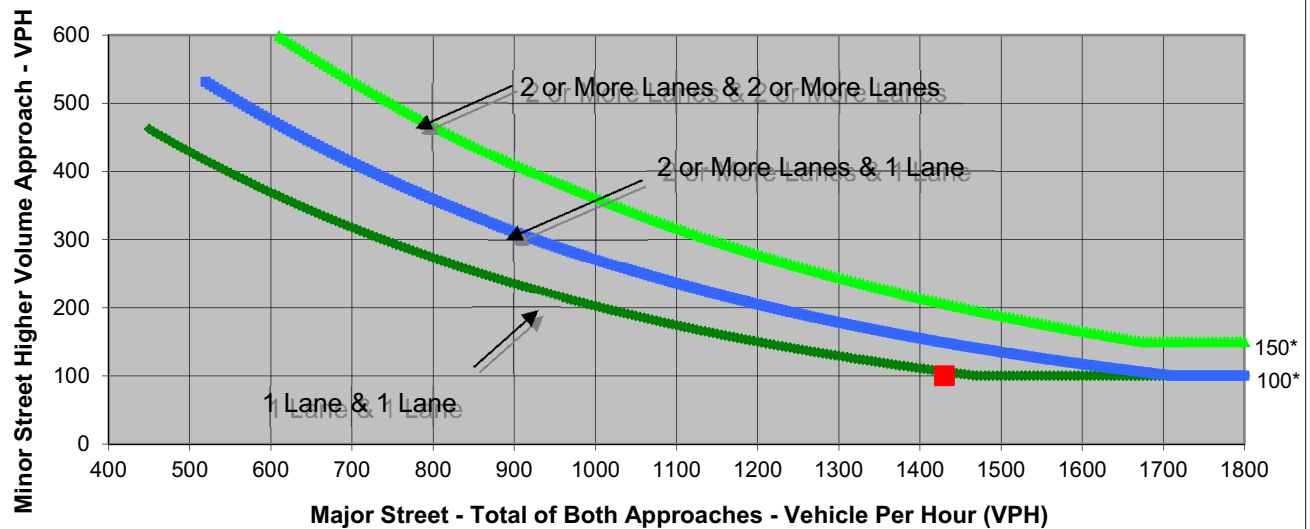
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	60	0	50
Through	790	450	0	0
Right	130	0	0	50
Total	920	510	0	100

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Wawona Street	Warrant Met
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	1,430	100	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Wawona Street**

Project **FEZ EIR**
Scenario **Cumulative No Project**
Peak Hour **PM**

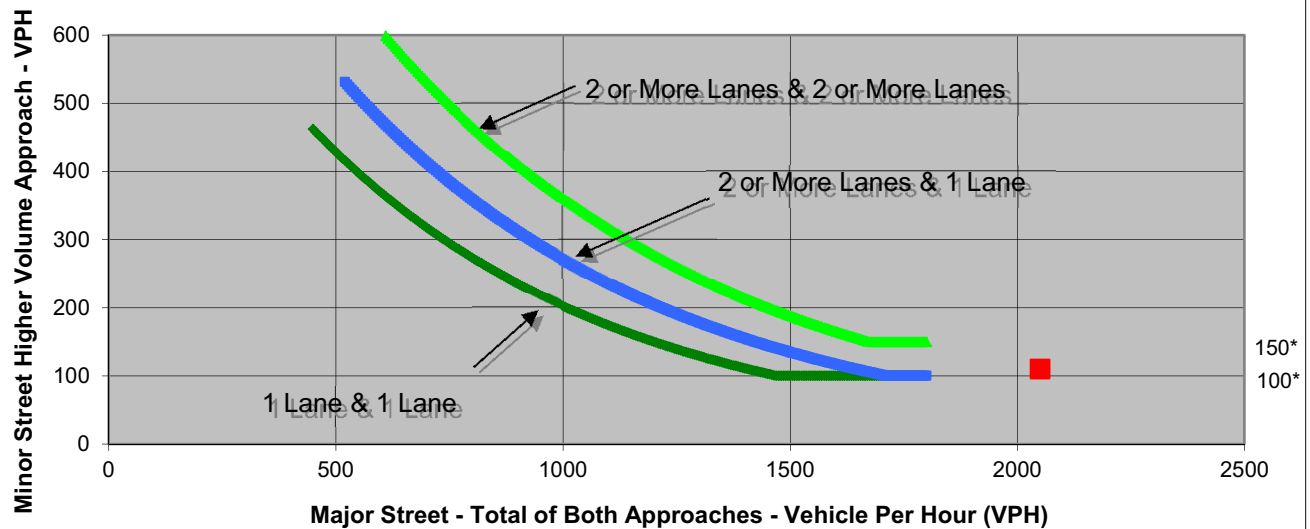
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	60	0	70
Through	880	1,040	0	0
Right	70	0	0	40
Total	950	1,100	0	110

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Airport Way	Minor Street Wawona Street	Warrant Met
Number of Approach Lanes	2	1	<u>YES</u>
Traffic Volume (VPH) *	2,050	110	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

1: Atherton Dr & Airport Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Delay / Veh (s)	4016.2			753.2	1154.5	182.8	44.8	68.4	35.1	119.1	1.2	1.1
Vehicles Exited	1	0	0	2	2	60	2	258	4	38	60	39
Hourly Exit Rate	4	0	0	8	8	240	8	1032	16	152	240	156
Input Volume	337	11	11	21	42	316	11	1137	21	179	265	168
% of Volume	1	0	0	38	19	76	73	91	76	85	91	93
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	44	1	1	0	0	0	0	0	0	0	0	0

1: Atherton Dr & Airport Way Performance by movement

Movement	All
Delay / Veh (s)	253.1
Vehicles Exited	466
Hourly Exit Rate	1864
Input Volume	2519
% of Volume	74
Denied Entry Before	0
Denied Entry After	46

2: SR 120 EB Ramps & Airport Way Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	336.4	280.3	132.8	62.2	11.2	201.7	44.7	107.8
Vehicles Exited	82	1	28	230	96	33	106	576
Hourly Exit Rate	328	4	112	920	384	132	424	2304
Input Volume	484	11	126	1320	505	168	474	3088
% of Volume	68	36	89	70	76	79	89	75
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

3: SR 120 WB Ramps & Airport Way Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	44.6	38.5	20.2	75.2	48.7	46.7	18.3	42.0
Vehicles Exited	40	3	121	105	201	111	118	699
Hourly Exit Rate	160	12	484	420	804	444	472	2796
Input Volume	179	11	484	600	1169	463	463	3369
% of Volume	89	109	100	70	69	96	102	83
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

4: Daniels St & Airport Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Delay / Veh (s)	39.7	33.8	14.7	61.0	33.4	7.5	38.7	21.2	5.9	51.6	22.4	6.3
Vehicles Exited	12	8	46	78	10	18	54	169	94	35	104	18
Hourly Exit Rate	48	32	184	312	40	72	216	676	376	140	416	72
Input Volume	53	32	189	316	42	74	284	895	474	147	421	74
% of Volume	91	100	97	99	95	97	76	76	79	95	99	97
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

4: Daniels St & Airport Way Performance by movement

Movement	All
Delay / Veh (s)	26.5
Vehicles Exited	646
Hourly Exit Rate	2584
Input Volume	3001
% of Volume	86
Denied Entry Before	0
Denied Entry After	0

9: SR-120 EB On-Ramp & McKinley Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBT	SBR	All
Delay / Veh (s)	28.0	24.3	15.8	18.4	6.2	7.8	3.4	15.1
Vehicles Exited	26	3	157	521	110	74	56	947
Hourly Exit Rate	104	12	628	2084	440	296	224	3788
Input Volume	105	11	632	2105	453	295	211	3812
% of Volume	99	109	99	99	97	100	106	99
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

10: SR-120 WB Off-Ramp & McKinley Avenue Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBT	SBR	All
Delay / Veh (s)	27.8	46.0	9.6	9.4	18.3	3.7	0.8	14.4
Vehicles Exited	49	2	217	93	453	78	9	901
Hourly Exit Rate	196	8	868	372	1812	312	36	3604
Input Volume	200	11	895	368	1842	305	32	3653
% of Volume	98	73	97	101	98	102	112	99
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

Total Network Performance

Delay / Veh (s)	128.3
Vehicles Exited	2107
Hourly Exit Rate	8428
Input Volume	38757
% of Volume	22
Denied Entry Before	0
Denied Entry After	53

Intersection: 1: Atherton Dr & Airport Way

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	B55	B55	SB
Directions Served	LT	R	L	T	R	L	T	T	R	T	T	L
Maximum Queue (ft)	1365	1368	154	512	649	79	667	633	27	311	290	189
Average Queue (ft)	1281	1252	84	260	404	12	510	460	4	104	76	142
95th Queue (ft)	1489	1503	209	668	817	91	892	852	49	375	340	236
Link Distance (ft)	1355	1355		1160	1160		653	653		852	852	
Upstream Blk Time (%)	61	48					26	12				
Queuing Penalty (veh)	0	0					0	0				
Storage Bay Dist (ft)			340			210			210			175
Storage Blk Time (%)				3			50	25				26
Queuing Penalty (veh)				1			5	5				33

Intersection: 1: Atherton Dr & Airport Way

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	209	116
Average Queue (ft)	106	20
95th Queue (ft)	389	158
Link Distance (ft)	674	674
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	2	0

Intersection: 2: SR 120 EB Ramps & Airport Way

Movement	EB	EB	B20	NB	NB	SB	SB
Directions Served	LT	R	T	T	R	L	T
Maximum Queue (ft)	1708	724	195	755	753	260	732
Average Queue (ft)	1334	308	66	701	462	217	442
95th Queue (ft)	2008	851	244	752	963	323	1132
Link Distance (ft)	1670		246	674	674		1414
Upstream Blk Time (%)	20		11	31	6		3
Queuing Penalty (veh)	0		0	276	57		20
Storage Bay Dist (ft)		700				250	
Storage Blk Time (%)	60	0				28	1
Queuing Penalty (veh)	76	1				131	2

Intersection: 3: SR 120 WB Ramps & Airport Way

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	T	T	R
Maximum Queue (ft)	223	339	275	1425	401	321
Average Queue (ft)	125	186	262	1120	308	181
95th Queue (ft)	243	365	304	1691	453	321
Link Distance (ft)	1716			1414	398	398
Upstream Blk Time (%)				6	7	0
Queuing Penalty (veh)				106	31	2
Storage Bay Dist (ft)		500	250			
Storage Blk Time (%)		0	20	8		
Queuing Penalty (veh)		0	231	47		

Intersection: 4: Daniels St & Airport Way

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	L	T	R	L	L	T	T
Maximum Queue (ft)	30	51	47	146	212	246	60	60	101	152	253	247
Average Queue (ft)	9	27	21	65	130	141	30	27	58	86	140	153
95th Queue (ft)	30	57	51	139	238	254	70	65	105	166	253	252
Link Distance (ft)		1286	1286				1479				398	398
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			325	350	350		350	200	200		
Storage Blk Time (%)				0		0					2	0
Queuing Penalty (veh)				0		0					7	1

Intersection: 4: Daniels St & Airport Way

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	T	T	R
Maximum Queue (ft)	173	171	221	216	45
Average Queue (ft)	76	115	113	105	26
95th Queue (ft)	167	195	235	226	52
Link Distance (ft)			1962	1962	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300	175			250
Storage Blk Time (%)	0	3	1	0	
Queuing Penalty (veh)	0	7	2	0	

Intersection: 9: SR-120 EB On-Ramp & McKinley Ave

Movement	EB	EB	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	R	R	T	T	T	T	T
Maximum Queue (ft)	80	65	100	98	138	55	316	368	74	84
Average Queue (ft)	40	36	65	73	104	11	161	225	31	45
95th Queue (ft)	80	68	107	106	144	86	368	417	82	92
Link Distance (ft)			1528	1528		2467	2467	2467	955	955
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	725	725			725					
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 10: SR-120 WB Off-Ramp & McKinley Avenue

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	R	T	T	R	R	T	T	R	R
Maximum Queue (ft)	88	103	111	118	58	129	306	280	29	76	4	16
Average Queue (ft)	46	62	62	66	24	49	149	142	8	31	0	4
95th Queue (ft)	90	112	112	115	61	164	314	293	29	79	5	16
Link Distance (ft)		1876	1876		955	955	955		1318	1318		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700			700				750			500	500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 1043

1: Atherton Dr & Airport Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Delay / Veh (s)	1094.3	1028.2	533.5	52.7	370.5	11.4	12.1	1.7	0.5	7.3	1.3	1.5
Vehicles Exited	14	2	1	13	15	51	3	102	5	60	203	45
Hourly Exit Rate	56	8	4	52	60	204	12	408	20	240	812	180
Input Volume	232	21	11	53	74	211	11	389	21	316	1160	295
% of Volume	24	38	36	98	81	97	109	105	95	76	70	61
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Atherton Dr & Airport Way Performance by movement

Movement	All
Delay / Veh (s)	102.2
Vehicles Exited	514
Hourly Exit Rate	2056
Input Volume	2794
% of Volume	74
Denied Entry Before	0
Denied Entry After	0

2: SR 120 EB Ramps & Airport Way Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	175.3	185.7	72.6	63.4	7.0	104.3	67.9	88.0
Vehicles Exited	115	2	123	118	51	79	178	666
Hourly Exit Rate	460	8	492	472	204	316	712	2664
Input Volume	663	11	579	607	242	505	1159	3766
% of Volume	69	73	85	78	84	63	61	71
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

3: SR 120 WB Ramps & Airport Way Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	314.7	344.5	303.2	178.4	83.6	28.4	6.8	110.8
Vehicles Exited	66	2	72	29	188	198	116	671
Hourly Exit Rate	264	8	288	116	752	792	464	2684
Input Volume	432	11	495	179	1075	1232	642	4066
% of Volume	61	73	58	65	70	64	72	66
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

4: Daniels St & Airport Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Delay / Veh (s)	39.7	77.2	109.3	917.4	529.4	525.2	163.4	39.7	5.9	333.5	283.7	171.4
Vehicles Exited	82	25	132	40	10	17	98	93	60	17	135	56
Hourly Exit Rate	328	100	528	160	40	68	392	372	240	68	540	224
Input Volume	337	116	579	463	116	189	611	590	368	95	832	274
% of Volume	97	86	91	35	34	36	64	63	65	72	65	82
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	1	8	4

4: Daniels St & Airport Way Performance by movement

Movement	All
Delay / Veh (s)	194.6
Vehicles Exited	765
Hourly Exit Rate	3060
Input Volume	4570
% of Volume	67
Denied Entry Before	0
Denied Entry After	13

9: SR-120 EB On-Ramp & McKinley Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBT	SBR	All
Delay / Veh (s)	17.8	12.3	16.8	14.4	2.5	33.2	11.9	17.1
Vehicles Exited	11	3	487	263	87	193	200	1244
Hourly Exit Rate	44	12	1948	1052	348	772	800	4976
Input Volume	42	11	1926	1053	326	779	800	4937
% of Volume	105	109	101	100	107	99	100	101
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

10: SR-120 WB Off-Ramp & McKinley Avenue Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBT	SBR	All
Delay / Veh (s)	21.3	21.0	2.1	8.6	10.2	13.6	4.5	12.0
Vehicles Exited	120	3	74	43	233	273	33	779
Hourly Exit Rate	480	12	296	172	932	1092	132	3116
Input Volume	484	11	295	169	926	1095	137	3117
% of Volume	99	109	100	102	101	100	96	100
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

Total Network Performance

Delay / Veh (s)	187.3
Vehicles Exited	2443
Hourly Exit Rate	9772
Input Volume	46519
% of Volume	21
Denied Entry Before	4
Denied Entry After	220

Intersection: 1: Atherton Dr & Airport Way

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	T	R	L	T	T	R	L	T	R
Maximum Queue (ft)	1354	1169	110	274	90	27	23	13	5	101	4	16
Average Queue (ft)	983	878	48	201	54	8	7	4	1	54	0	4
95th Queue (ft)	1370	1272	149	380	118	29	58	30	6	99	5	19
Link Distance (ft)	1533	1533		1516	1516		686	686			658	
Upstream Blk Time (%)	0											
Queuing Penalty (veh)	0											
Storage Bay Dist (ft)			340			210			210	175		375
Storage Blk Time (%)				6								
Queuing Penalty (veh)				3								

Intersection: 2: SR 120 EB Ramps & Airport Way

Movement	EB	EB	B20	NB	NB	SB	SB
Directions Served	LT	R	T	T	R	L	T
Maximum Queue (ft)	1692	725	202	536	177	274	1222
Average Queue (ft)	1286	528	96	402	74	253	1081
95th Queue (ft)	2131	933	271	639	272	301	1754
Link Distance (ft)	1670		196	658	658		1414
Upstream Blk Time (%)	19		18	3	0		5
Queuing Penalty (veh)	0		0	13	2		88
Storage Bay Dist (ft)		700				250	
Storage Blk Time (%)	32	0				19	19
Queuing Penalty (veh)	183	3				225	96

Intersection: 3: SR 120 WB Ramps & Airport Way

Movement	WB	WB	B23	NB	NB	SB	SB
Directions Served	LT	R	T	L	T	T	R
Maximum Queue (ft)	1801	525	425	270	1327	420	197
Average Queue (ft)	1579	480	252	181	1027	399	99
95th Queue (ft)	2211	633	568	315	1676	469	235
Link Distance (ft)	1716		400		1414	400	400
Upstream Blk Time (%)	41		34		7	17	0
Queuing Penalty (veh)	0		0		90	161	2
Storage Bay Dist (ft)		500		250			
Storage Blk Time (%)	33	31		14	35		
Queuing Penalty (veh)	165	135		146	62		

Intersection: 4: Daniels St & Airport Way

Movement	EB	EB	EB	EB	B17	B17	WB	WB	WB	WB	B19	NB
Directions Served	L	L	T	R	T	T	L	L	T	R	T	L
Maximum Queue (ft)	184	709	943	349	61	67	362	374	1560	70	385	262
Average Queue (ft)	109	367	619	330	25	28	348	345	1528	23	339	248
95th Queue (ft)	206	1129	1395	395	139	153	376	492	1687	70	507	281
Link Distance (ft)		1283	1283		236	236			1479		356	
Upstream Blk Time (%)		3	8		3	6			78		73	
Queuing Penalty (veh)		0	0		0	0			0		0	
Storage Bay Dist (ft)	225			325			350	350		350		200
Storage Blk Time (%)	1	2	0	37			57	67	0			51
Queuing Penalty (veh)	2	3	0	43			173	204	0			150

Intersection: 4: Daniels St & Airport Way

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	T	R	L	T	T	R
Maximum Queue (ft)	324	426	368	96	187	1866	1859	255
Average Queue (ft)	313	372	178	53	108	1304	1285	108
95th Queue (ft)	364	545	368	105	214	2011	1996	246
Link Distance (ft)		400	400			1962	1962	
Upstream Blk Time (%)		28	0			5	7	
Queuing Penalty (veh)		220	1			0	0	
Storage Bay Dist (ft)	200			300	175			250
Storage Blk Time (%)	67	1			1	74	10	0
Queuing Penalty (veh)	197	7			3	70	28	1

Intersection: 9: SR-120 EB On-Ramp & McKinley Ave

Movement	EB	EB	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	R	R	T	T	T	T	T	R
Maximum Queue (ft)	30	50	280	250	266	55	166	234	285	289	184
Average Queue (ft)	11	18	194	188	203	12	100	141	177	195	22
95th Queue (ft)	34	51	284	261	278	53	186	238	306	307	151
Link Distance (ft)			1548	1548		2465	2465	2465	953	953	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	725	725			725						200
Storage Blk Time (%)										9	
Queuing Penalty (veh)										71	

Intersection: 10: SR-120 WB Off-Ramp & McKinley Avenue

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	R	T	T	R	R	T	T	R	R
Maximum Queue (ft)	148	156	39	37	25	44	113	134	116	353	19	26
Average Queue (ft)	96	96	14	15	8	17	63	73	48	202	6	13
95th Queue (ft)	150	159	36	38	25	44	121	134	119	363	19	28
Link Distance (ft)		1894	1894		953	953	953		1347	1347		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700			700				750			500	500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 2548

Cumulative Plus Project Conditions Technical Calculations

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project
AM Peak Hour

Intersection 1

Airport Way/Atherton Dr

Side Street Stop

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	3	2	80.0%	90.7	76.2	F
	Through	294	259	88.2%	94.0	30.5	F
	Right Turn	5	4	78.0%	47.1	27.1	E
	Subtotal	302	266	88.0%	93.5	30.6	F
SB	Left Turn	45	33	73.8%	140.0	76.4	F
	Through	65	54	83.5%	1.8	2.6	A
	Right Turn	42	31	74.5%	1.2	0.5	A
	Subtotal	152	119	78.2%	38.3	18.2	E
EB	Left Turn	84	0	0.2%	378.2	46.1	F
	Through	3	0	0.0%	0.0	0.0	A
	Right Turn	3	0	0.0%	0.0	0.0	A
	Subtotal	90	0	0.2%	410.6	872.0	F
WB	Left Turn	5	2	34.0%	924.2	858.0	F
	Through	11	5	40.9%	947.0	666.3	F
	Right Turn	79	50	63.4%	297.5	110.6	F
	Subtotal	95	56	59.3%	328.2	114.5	F
Total		639	441	69.0%	109.2	27.4	F

Intersection 2

Airport Way/SR120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	331	228	68.8%	72.6	5.4	E
	Right Turn	126	92	73.0%	17.4	2.9	B
	Subtotal	457	320	70.0%	56.7	4.2	E
SB	Left Turn	47	33	71.1%	269.5	93.8	F
	Through	120	99	82.7%	81.3	45.7	F
	Right Turn						
	Subtotal	167	133	79.4%	129.4	57.7	F
EB	Left Turn	111	69	62.3%	358.0	126.8	F
	Through	3	1	33.3%	374.8	347.5	F
	Right Turn	32	22	67.5%	116.1	81.8	F
	Subtotal	146	92	62.8%	299.5	116.6	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		770	544	70.6%	112.4	22.1	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project
AM Peak Hour

Intersection 3

Airport Way/SR120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	150	100	66.4%	102.2	9.0	F
	Through	292	189	64.7%	70.0	6.4	E
	Right Turn						
	Subtotal	442	289	65.3%	81.1	7.6	F
SB	Left Turn						
	Through	123	114	93.0%	49.5	9.6	D
	Right Turn	108	107	99.2%	15.2	2.9	B
	Subtotal	231	222	95.9%	32.9	5.4	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	45	42	92.2%	59.2	29.5	E
	Through	3	3	90.0%	45.3	44.4	D
	Right Turn	157	159	101.3%	34.9	8.2	C
	Subtotal	205	203	99.2%	40.2	10.0	D
Total		878	713	81.3%	54.4	4.2	D

Intersection 4

Airport Way/Daniels St

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	107	80	74.6%	45.4	4.1	D
	Through	224	173	77.2%	27.7	3.9	C
	Right Turn	118	91	77.4%	11.3	1.4	B
	Subtotal	449	344	76.6%	27.4	2.8	C
SB	Left Turn	37	33	90.3%	49.9	7.9	D
	Through	105	104	98.8%	30.2	12.2	C
	Right Turn	36	36	98.6%	9.0	3.7	A
	Subtotal	178	173	97.0%	29.6	8.8	C
EB	Left Turn	16	17	104.4%	36.2	8.0	D
	Through	9	9	94.4%	29.2	10.7	C
	Right Turn	46	48	103.9%	10.9	3.3	B
	Subtotal	71	73	102.8%	18.9	4.1	B
WB	Left Turn	79	74	93.0%	67.1	26.3	E
	Through	33	32	97.0%	20.3	7.1	C
	Right Turn						
	Subtotal	112	106	94.2%	53.3	20.2	D
Total		810	695	85.8%	30.9	4.1	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project
AM Peak Hour

Intersection 9

McKinley Ave/SR120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	531	535	100.7%	32.7	5.7	C
	Right Turn	113	112	99.2%	12.6	1.9	B
	Subtotal	644	647	100.5%	29.3	4.9	C
SB	Left Turn						
	Through	74	75	100.8%	6.2	2.1	A
	Right Turn	53	51	95.3%	3.6	0.6	A
	Subtotal	127	125	98.5%	5.1	1.3	A
EB	Left Turn	63	61	97.5%	26.8	2.2	C
	Through	3	3	90.0%	33.8	11.1	C
	Right Turn	158	151	95.8%	14.1	1.1	B
	Subtotal	224	216	96.2%	18.0	1.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		995	988	99.3%	23.8	3.4	C

Intersection 10

McKinley Way/SR120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	133	134	100.8%	15.2	2.5	B
	Right Turn	461	463	100.5%	24.1	1.8	C
	Subtotal	594	597	100.5%	22.1	1.7	C
SB	Left Turn						
	Through	77	78	101.7%	5.6	1.0	A
	Right Turn	19	20	106.3%	3.0	0.8	A
	Subtotal	96	99	102.6%	5.0	0.9	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	50	49	97.6%	24.8	4.4	C
	Through	3	3	100.0%	24.3	15.6	C
	Right Turn	224	219	97.7%	11.7	1.5	B
	Subtotal	277	271	97.7%	14.2	1.4	B
Total		967	966	99.9%	18.2	1.1	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project
AM Peak Hour

Intersection 11

McKinley Ave/Daniels St Extension

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	316	320	101.1%	10.5	1.9	B
	Right Turn	41	42	102.0%	9.8	2.0	A
	Subtotal	357	361	101.2%	10.4	1.9	B
SB	Left Turn	4	6	137.5%	21.7	4.2	C
	Through	84	82	97.5%	11.4	3.0	B
	Right Turn						
	Subtotal	88	87	99.3%	12.0	2.9	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	12	13	105.8%	18.1	4.5	B
	Through						
	Right Turn	1	1	80.0%	4.0	6.3	A
	Subtotal	13	14	103.8%	17.9	4.2	B
Total		458	462	100.9%	10.9	1.6	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project
PM Peak Hour

Intersection 1

Airport Way/Atherton Dr

Side Street Stop

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	3	3	93.3%	20.0	8.0	C
	Through	101	103	102.0%	12.8	2.8	B
	Right Turn	5	6	110.0%	11.8	3.2	B
	Subtotal	109	111	102.1%	12.9	2.8	B
SB	Left Turn	79	60	75.6%	7.4	2.3	A
	Through	291	214	73.4%	1.2	0.1	A
	Right Turn	74	55	74.1%	1.5	0.1	A
	Subtotal	444	328	73.9%	2.4	0.5	A
EB	Left Turn	58	13	21.9%	1088.9	249.7	F
	Through	5	1	28.0%	1178.7	711.5	F
	Right Turn	3	1	46.7%	468.2	302.5	F
	Subtotal	66	16	23.5%	1017.4	229.0	F
WB	Left Turn	13	12	92.3%	71.1	31.4	F
	Through	18	12	67.2%	452.3	240.3	F
	Right Turn	53	52	97.5%	7.9	2.1	A
	Subtotal	84	76	90.2%	86.9	35.7	F
Total		703	531	75.5%	46.2	13.6	E

Intersection 2

Airport Way/SR120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	151	119	78.7%	77.0	18.4	E
	Right Turn	61	46	75.1%	20.7	5.0	C
	Subtotal	212	165	77.7%	61.1	12.5	E
SB	Left Turn	160	85	53.1%	109.6	25.7	F
	Through	299	174	58.1%	69.8	21.0	E
	Right Turn						
	Subtotal	459	259	56.4%	82.9	22.6	F
EB	Left Turn	118	113	95.9%	45.3	12.7	D
	Through	3	3	86.7%	44.1	20.7	D
	Right Turn	145	143	98.9%	19.3	4.3	B
	Subtotal	266	259	97.4%	31.3	6.4	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		937	683	72.8%	57.9	7.0	E

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project
PM Peak Hour

Intersection 3

Airport Way/SR120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	45	30	66.9%	105.5	45.3	F
	Through	224	194	86.6%	33.6	4.7	C
	Right Turn						
	Subtotal	269	224	83.3%	43.5	9.4	D
SB	Left Turn						
	Through	351	193	55.0%	31.0	8.4	C
	Right Turn	116	61	52.5%	5.9	2.3	A
	Subtotal	467	254	54.4%	25.1	6.9	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	108	77	71.1%	274.9	119.1	F
	Through	3	3	90.0%	259.1	144.7	F
	Right Turn	133	96	72.3%	148.1	95.4	F
	Subtotal	244	176	72.0%	205.3	106.4	F
Total		980	654	66.7%	75.7	17.2	E

Intersection 4

Airport Way/Daniels St

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	117	93	79.4%	97.0	24.8	F
	Through	147	120	81.3%	42.4	5.5	D
	Right Turn	92	71	77.5%	17.9	2.9	B
	Subtotal	356	284	79.7%	54.5	10.8	D
SB	Left Turn	24	10	40.4%	566.8	126.9	F
	Through	208	107	51.5%	525.4	136.9	F
	Right Turn	73	42	57.8%	377.4	120.3	F
	Subtotal	305	159	52.1%	487.5	127.1	F
EB	Left Turn	101	99	98.0%	49.7	31.3	D
	Through	33	28	84.2%	89.8	81.3	F
	Right Turn	143	125	87.6%	133.9	146.9	F
	Subtotal	277	252	91.0%	91.4	79.0	F
WB	Left Turn	116	21	17.9%	3860.8	3103.6	F
	Through	77	13	16.6%	3422.1	3542.8	F
	Right Turn						
	Subtotal	193	34	17.4%	3462.1	2834.1	F
Total		1,131	728	64.4%	218.5	29.7	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project
PM Peak Hour

Intersection 9

McKinley Ave/SR120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	264	263	99.6%	26.0	3.6	C
	Right Turn	82	86	105.4%	14.0	3.1	B
	Subtotal	346	349	101.0%	23.1	3.7	C
SB	Left Turn						
	Through	199	192	96.6%	32.3	6.4	C
	Right Turn	200	194	97.1%	11.3	1.6	B
	Subtotal	399	386	96.8%	21.8	4.1	C
EB	Left Turn	64	63	98.4%	17.8	2.2	B
	Through	3	3	83.3%	21.6	8.4	C
	Right Turn	482	488	101.1%	16.2	1.4	B
	Subtotal	549	553	100.7%	16.4	1.3	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,294	1,289	99.6%	19.9	1.5	B

Intersection 10

McKinley Way/SR120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	97	97	99.9%	22.6	4.0	C
	Right Turn	232	230	99.2%	21.5	3.4	C
	Subtotal	329	327	99.4%	21.8	3.4	C
SB	Left Turn						
	Through	278	285	102.6%	16.1	1.8	B
	Right Turn	103	104	100.7%	7.8	0.8	A
	Subtotal	381	389	102.0%	13.9	1.5	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	121	115	95.1%	21.7	2.7	C
	Through	3	4	123.3%	27.4	10.3	C
	Right Turn	74	69	93.1%	3.1	0.8	A
	Subtotal	198	188	94.8%	15.1	1.7	B
Total		908	904	99.5%	17.0	1.2	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project
PM Peak Hour

Intersection 11

McKinley Ave/Daniels St Extension

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	116	122	104.8%	22.9	6.4	C
	Right Turn	55	50	91.3%	16.1	3.4	B
	Subtotal	171	172	100.5%	20.9	5.6	C
SB	Left Turn	1	2	150.0%	30.0	20.3	C
	Through	308	305	98.9%	22.0	6.9	C
	Right Turn						
	Subtotal	309	306	99.1%	22.0	6.9	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	73	73	100.5%	18.6	1.6	B
	Through						
	Right Turn	4	5	125.0%	14.7	9.0	B
	Subtotal	77	78	101.8%	18.2	1.6	B
Total		557	556	99.9%	21.1	3.9	C

HCM Unsignalized Intersection Capacity Analysis 5: Wawona St. & Airport Way

Cumulative Plus Project
AM Peak Hour

							
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Volume (veh/h)	54	50	799	131	60	514	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	
Hourly flow rate (vph)	65	60	963	158	72	619	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type			None			None	
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	1417	481			1120		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1417	481			1120		
tC, single (s)	6.8	6.9			4.2		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	42	89			88		
cM capacity (veh/h)	113	531			602		
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	125	481	481	158	72	310	310
Volume Left	65	0	0	0	72	0	0
Volume Right	60	0	0	158	0	0	0
cSH	181	1700	1700	1700	602	1700	1700
Volume to Capacity	0.69	0.28	0.28	0.09	0.12	0.18	0.18
Queue Length 95th (ft)	105	0	0	0	10	0	0
Control Delay (s)	60.3	0.0	0.0	0.0	11.8	0.0	0.0
Lane LOS	F				B		
Approach Delay (s)	60.3	0.0			1.2		
Approach LOS	F						
Intersection Summary							
Average Delay			4.3				
Intersection Capacity Utilization			41.5%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Signalized Intersection Capacity Analysis

6: Yosemite Avenue & Airport Way

Cumulative Plus Project
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	270	59	106	320	200	61	603	155	310	439	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.3	5.3		5.3	5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Flt Protected	1.00	0.97		1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1626	3402		1687	3310		1703	3359		1770	3505	1538
Satd. Flow (perm)	1626	3402		1687	3310		1703	3359		1770	3505	1538
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	67	303	66	119	360	225	69	678	174	348	493	461
RTOR Reduction (vph)	0	14	0	0	71	0	0	17	0	0	0	195
Lane Group Flow (vph)	67	355	0	119	514	0	69	835	0	348	493	266
Heavy Vehicles (%)	11%	2%	9%	7%	2%	4%	6%	5%	1%	2%	3%	5%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	6.3	20.2		11.7	25.6		7.9	36.3		27.3	55.7	55.7
Effective Green, g (s)	6.3	20.2		11.7	25.6		7.9	36.3		27.3	55.7	55.7
Actuated g/C Ratio	0.05	0.17		0.10	0.22		0.07	0.31		0.23	0.47	0.47
Clearance Time (s)	5.7	5.7		5.7	5.7		5.3	5.3		5.3	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	87	585		168	721		114	1038		411	1662	729
v/s Ratio Prot	0.04	0.10		c0.07	c0.16		0.04	c0.25		c0.20	0.14	
v/s Ratio Perm												0.17
v/c Ratio	0.77	0.61		0.71	0.71		0.61	0.80		0.85	0.30	0.37
Uniform Delay, d1	54.9	45.0		51.2	42.5		53.3	37.3		43.1	18.9	19.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	33.4	1.8		12.8	3.3		8.8	4.6		14.8	0.1	0.3
Delay (s)	88.3	46.8		64.0	45.9		62.1	41.9		57.9	19.0	20.0
Level of Service	F	D		E	D		E	D		E	B	B
Approach Delay (s)		53.1			49.0			43.4			29.7	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM Average Control Delay			40.6			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			117.5			Sum of lost time (s)			22.0			
Intersection Capacity Utilization			75.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: Yosemite Ave & McKinley Ave

Cumulative Plus Project
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	170	64	340	370	70	141	182	50	160	521	140
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	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1444	3085	1509	1770	2935	1583	1736	1863	1583	1641	1863	1429
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1444	3085	1509	1770	2935	1583	1736	1863	1583	1641	1863	1429
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	179	67	358	389	74	148	192	53	168	548	147
RTOR Reduction (vph)	0	0	57	0	0	48	0	0	38	0	0	75
Lane Group Flow (vph)	21	179	10	358	389	26	148	192	15	168	548	72
Heavy Vehicles (%)	25%	17%	7%	2%	23%	2%	4%	2%	2%	10%	2%	13%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	2.3	13.1	13.1	19.3	30.1	30.1	9.1	23.4	23.4	13.1	27.4	27.4
Effective Green, g (s)	2.3	13.1	13.1	19.3	30.1	30.1	9.1	23.4	23.4	13.1	27.4	27.4
Actuated g/C Ratio	0.03	0.15	0.15	0.23	0.35	0.35	0.11	0.28	0.28	0.15	0.32	0.32
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	39	476	233	402	1041	561	186	513	436	253	601	461
v/s Ratio Prot	0.01	0.06		c0.20	c0.13		c0.09	0.10		0.10	c0.29	
v/s Ratio Perm			0.01			0.02			0.01			0.05
v/c Ratio	0.54	0.38	0.04	0.89	0.37	0.05	0.80	0.37	0.03	0.66	0.91	0.16
Uniform Delay, d1	40.8	32.2	30.6	31.8	20.4	18.0	37.0	24.8	22.5	33.8	27.6	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.5	0.5	0.1	21.0	0.2	0.0	20.5	0.5	0.0	6.4	18.2	0.2
Delay (s)	54.3	32.7	30.6	52.8	20.6	18.0	57.5	25.3	22.5	40.2	45.8	20.7
Level of Service	D	C	C	D	C	B	E	C	C	D	D	C
Approach Delay (s)		33.9			34.4			37.1			40.4	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay			37.0			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			84.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			72.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Daniels Street & Milo Candini Drive

Cumulative Plus Project
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	119	24	20	338	20	59	10	10	10	10	26
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		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3449		1770	3510		1770	1863	1583	1770	1661	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3449		1770	3510		1770	1863	1583	1770	1661	
Peak-hour factor, PHF	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Adj. Flow (vph)	20	157	32	26	445	26	78	13	13	13	13	34
RTOR Reduction (vph)	0	14	0	0	3	0	0	0	11	0	30	0
Lane Group Flow (vph)	20	175	0	26	468	0	78	13	2	13	17	0
Turn Type	Prot			Prot			Split			Perm		Split
Protected Phases	7	4		3	8		2	2			6	6
Permitted Phases									2			
Actuated Green, G (s)	0.5	13.0		0.5	13.0		5.8	5.8	5.8	5.0	5.0	
Effective Green, g (s)	0.5	13.0		0.5	13.0		5.8	5.8	5.8	5.0	5.0	
Actuated g/C Ratio	0.01	0.32		0.01	0.32		0.14	0.14	0.14	0.12	0.12	
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	1113		22	1132		255	268	228	220	206	
v/s Ratio Prot	0.01	0.05		c0.01	c0.13		c0.04	0.01		0.01	c0.01	
v/s Ratio Perm									0.00			
v/c Ratio	0.91	0.16		1.18	0.41		0.31	0.05	0.01	0.06	0.08	
Uniform Delay, d1	19.9	9.7		19.9	10.7		15.4	14.9	14.8	15.6	15.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	148.5	0.1		253.5	0.2		0.7	0.1	0.0	0.1	0.2	
Delay (s)	168.3	9.8		273.4	10.9		16.1	14.9	14.8	15.7	15.8	
Level of Service	F	A		F	B		B	B	B	B	B	
Approach Delay (s)		25.0			24.6			15.8			15.8	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay			23.1			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			40.3			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			33.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 5: Wawona St. & Airport Way

Cumulative Plus Project Conditions
PM Peak Hour

							
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations			 			 	
Volume (veh/h)	71	40	939	74	60	1054	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	77	43	1021	80	65	1146	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type			None			None	
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	1724	510			1101		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1724	510			1101		
tC, single (s)	6.8	6.9			4.1		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	0	91			90		
cM capacity (veh/h)	72	508			630		
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	121	510	510	80	65	573	573
Volume Left	77	0	0	0	65	0	0
Volume Right	43	0	0	80	0	0	0
cSH	104	1700	1700	1700	630	1700	1700
Volume to Capacity	1.16	0.30	0.30	0.05	0.10	0.34	0.34
Queue Length 95th (ft)	196	0	0	0	9	0	0
Control Delay (s)	215.5	0.0	0.0	0.0	11.4	0.0	0.0
Lane LOS	F				B		
Approach Delay (s)	215.5	0.0			0.6		
Approach LOS	F						
Intersection Summary							
Average Delay		11.0					
Intersection Capacity Utilization		45.7%		ICU Level of Service		A	
Analysis Period (min)		15					

HCM Signalized Intersection Capacity Analysis

6: Yosemite Avenue & Airport Way

Cumulative Plus Project Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	480	510	142	236	300	240	58	709	283	180	725	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.3	5.3		5.3	5.3	5.3
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Flt Protected	1.00	0.97		1.00	0.93		1.00	0.96		1.00	1.00	0.85
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1687	3424		1770	3303		1626	3388		1770	3539	1495
Satd. Flow (perm)	1687	3424		1770	3303		1626	3388		1770	3539	1495
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	527	560	156	259	330	264	64	779	311	198	797	154
RTOR Reduction (vph)	0	19	0	0	109	0	0	31	0	0	0	49
Lane Group Flow (vph)	527	697	0	259	485	0	64	1059	0	198	797	105
Heavy Vehicles (%)	7%	2%	2%	2%	2%	2%	11%	2%	2%	2%	2%	8%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	35.3	36.7		21.9	23.3		6.7	38.0		12.7	44.0	44.0
Effective Green, g (s)	35.3	36.7		21.9	23.3		6.7	38.0		12.7	44.0	44.0
Actuated g/C Ratio	0.27	0.28		0.17	0.18		0.05	0.29		0.10	0.34	0.34
Clearance Time (s)	5.7	5.7		5.7	5.7		5.3	5.3		5.3	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	454	957		295	586		83	981		171	1186	501
v/s Ratio Prot	c0.31	0.20		0.15	c0.15		0.04	c0.31		c0.11	0.23	
v/s Ratio Perm												0.07
v/c Ratio	1.16	0.73		0.88	0.83		0.77	1.08		1.16	0.67	0.21
Uniform Delay, d1	48.0	42.8		53.4	52.1		61.5	46.7		59.3	37.5	31.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	94.3	2.8		24.1	9.3		34.8	52.6		117.7	1.5	0.2
Delay (s)	142.3	45.6		77.5	61.4		96.4	99.2		177.0	39.0	31.4
Level of Service	F	D		E	E		F	F		F	D	C
Approach Delay (s)		86.6			66.3			99.1			61.7	
Approach LOS		F			E			F			E	
Intersection Summary												
HCM Average Control Delay			79.4			HCM Level of Service				E		
HCM Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			131.3			Sum of lost time (s)			22.0			
Intersection Capacity Utilization			99.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: Yosemite Ave & McKinley Ave

Cumulative Plus Project Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	460	181	90	250	180	24	601	400	140	274	50
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	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1228	3223	1583	1736	3112	1583	1770	1792	1583	1770	1863	1429
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1228	3223	1583	1736	3112	1583	1770	1792	1583	1770	1863	1429
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)	210	568	223	111	309	222	30	742	494	173	338	62
RTOR Reduction (vph)	0	0	173	0	0	187	0	0	180	0	0	33
Lane Group Flow (vph)	210	568	50	111	309	35	30	742	314	173	338	29
Heavy Vehicles (%)	47%	12%	2%	4%	16%	2%	2%	6%	2%	2%	2%	13%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.0	20.3	20.3	7.8	14.1	14.1	3.5	37.7	37.7	8.0	42.2	42.2
Effective Green, g (s)	14.0	20.3	20.3	7.8	14.1	14.1	3.5	37.7	37.7	8.0	42.2	42.2
Actuated g/C Ratio	0.16	0.23	0.23	0.09	0.16	0.16	0.04	0.42	0.42	0.09	0.47	0.47
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	191	729	358	151	489	249	69	752	665	158	875	672
v/s Ratio Prot	c0.17	c0.18		0.06	0.10		0.02	c0.41		c0.10	0.18	
v/s Ratio Perm			0.03			0.02			0.20			0.02
v/c Ratio	1.10	0.78	0.14	0.74	0.63	0.14	0.43	0.99	0.47	1.09	0.39	0.04
Uniform Delay, d1	37.9	32.6	27.8	40.0	35.4	32.6	42.2	25.8	18.8	40.9	15.4	12.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	94.2	5.3	0.2	16.9	2.7	0.3	4.3	29.2	0.5	99.3	0.3	0.0
Delay (s)	132.1	37.9	28.0	56.9	38.1	32.9	46.5	55.0	19.4	140.2	15.7	12.9
Level of Service	F	D	C	E	D	C	D	E	B	F	B	B
Approach Delay (s)		55.5			39.5			40.9			53.0	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM Average Control Delay			46.8			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			89.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			70.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Daniels Street & Milo Candini Drive

Cumulative Plus Project Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	683	57	60	127	320	166	10	40	30	10	21
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		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.89		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3498		1770	3160		1770	1863	1583	1770	1674	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3498		1770	3160		1770	1863	1583	1770	1674	
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)	104	734	61	65	137	344	178	11	43	32	11	23
RTOR Reduction (vph)	0	4	0	0	228	0	0	0	34	0	21	0
Lane Group Flow (vph)	104	791	0	65	253	0	178	11	9	32	13	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)	7.1	24.9		4.6	22.4		14.4	14.4	14.4	6.3	6.3	
Effective Green, g (s)	7.1	24.9		4.6	22.4		14.4	14.4	14.4	6.3	6.3	
Actuated g/C Ratio	0.11	0.38		0.07	0.34		0.22	0.22	0.22	0.10	0.10	
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	190	1316		123	1069		385	405	344	168	159	
v/s Ratio Prot	c0.06	c0.23		0.04	0.08		c0.10	0.01		c0.02	0.01	
v/s Ratio Perm									0.01			
v/c Ratio	0.55	0.60		0.53	0.24		0.46	0.03	0.03	0.19	0.08	
Uniform Delay, d1	28.0	16.6		29.8	15.8		22.5	20.4	20.4	27.6	27.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	0.8		4.1	0.1		0.9	0.0	0.0	0.6	0.2	
Delay (s)	31.2	17.4		33.8	15.9		23.4	20.4	20.4	28.2	27.5	
Level of Service	C	B		C	B		C	C	C	C	C	
Approach Delay (s)		19.0			18.0			22.7			27.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			19.5			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			66.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			49.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: McKinley Ave off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4050	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	849	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane	800	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	201	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4050	849	201	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1066	223	53	v
Trucks and buses	10	5	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.976	0.976	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4476	916	217	pcph

Estimation of V12 Diverge Areas

$$L = \text{(Equation 13-12 or 13-13)}$$

$$EQ$$

$$P = 0.450 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2518 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4476	7050	No
$v_{FO} = v_F - v_R$	3560	7050	No
v_R	916	4200	No
v_3 or v_{av34}	1958 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 2557$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2557	4400	No

Level of Service Determination (if not F)

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 14.5$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence B			

Speed Estimation

Intermediate speed variable,	$D_S = 0.315$	
Space mean speed in ramp influence area,	$S_R = 57.7$	mph
Space mean speed in outer lanes,	$S_0 = 67.7$	mph
Space mean speed for all vehicles,	$S = 61.6$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: McKinley Ave slip on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5333	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	84	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1101	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5333	84	1101	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1403	22	290	v
Trucks and buses	10	5	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.976	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5894	91	1217	pcph

Estimation of V12 Merge Areas

$$L = 7002.30 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.663 \text{ Using Equation 3}$$

FM

$$v_{12} = v_F (P_{FM}) = 3907 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	5985	7050	No
v ₃ or v _{av34}	1987 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} = 3907		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{R12}	3998	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 32.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M _S = 0.474	
Space mean speed in ramp influence area,	S _R = 54.1	mph
Space mean speed in outer lanes,	S ₀ = 59.6	mph
Space mean speed for all vehicles,	S = 55.8	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: Airport Way on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3291	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	670	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	692	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2230	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3291	670	692	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	866	176	182	v
Trucks and buses	10	4	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.980	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3637	719	736	pcph

Estimation of V12 Merge Areas

$$L = 4234.75 \text{ (Equation 13-6 or 13-7)}$$

$$EQ$$

$$P = 0.635 \text{ Using Equation 3}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 2311 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	4356	7050	No
v ₃ or v _{av34}	1326 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ /2		Yes	
If yes, v _{12A} = 2311		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	3030	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 25.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M _S = 0.342	
Space mean speed in ramp influence area,	S _R = 57.1	mph
Space mean speed in outer lanes,	S ₀ = 62.0	mph
Space mean speed for all vehicles,	S = 58.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: Airport Way off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4419	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	776	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	693	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2350	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4419	776	693	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1163	204	182	v
Trucks and buses	10	4	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.980	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4884	833	737	pcph

Estimation of V12 Diverge Areas

$$L = 6140.44 \text{ (Equation 13-12 or 13-13)}$$

$$EQ$$

$$P = 0.600 \text{ Using Equation 5}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3262 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4884	7050	No
$v_{FO} = v_F - v_R$	4051	7050	No
v_R	833	2100	No
$v_3 \text{ or } v_{av34}$	1622 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3262$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3262	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 L_D = 31.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.308$	
Space mean speed in ramp influence area,	$S_R = 57.9$	mph
Space mean speed in outer lanes,	$S_0 = 68.9$	mph
Space mean speed for all vehicles,	$S = 61.1$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: Union Rd off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3961	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	692	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	670	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2230	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3961	692	670	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1042	182	176	v
Trucks and buses	10	2	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.980	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4378	736	719	pcph

Estimation of V12 Diverge Areas

$$L = 6211.23 \text{ (Equation 13-12 or 13-13)}$$

$$EQ$$

$$P = 0.617 \text{ Using Equation 5}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 2982 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4378	7050	No
$v_{FO} = v_F - v_R$	3642	7050	No
v_R	736	2100	No
$v_3 \text{ or } v_{av34}$	1396 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2982$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2982	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 L_D = 16.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.299$	
Space mean speed in ramp influence area,	$S_R = 58.1$	mph
Space mean speed in outer lanes,	$S_0 = 69.8$	mph
Space mean speed for all vehicles,	$S = 61.4$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: Union Rd slip on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Mnateca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3726	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	693	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	776	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2350	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3726	693	776	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	981	182	204	v
Trucks and buses	10	2	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.980	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4118	737	833	pcph

Estimation of V12 Merge Areas

$$L = 4267.42 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.642 \text{ Using Equation 3}$$

FM

$$v_{12} = v_F (P_{FM}) = 2643 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	4855	7050	No
v ₃ or v _{av34}	1475 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ /2		No	
If yes, v _{12A} = 2643		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{R12}	3380	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 26.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M _S = 0.356	
Space mean speed in ramp influence area,	S _R = 56.8	mph
Space mean speed in outer lanes,	S ₀ = 61.5	mph
Space mean speed for all vehicles,	S = 58.2	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: McKinley Ave off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5737	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	2085	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane	800	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1092	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5737	2085	1092	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1510	549	287	v
Trucks and buses	10	3	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.985	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6341	2228	1195	pcph

Estimation of V12 Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.450 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P_{FD} = 4079 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6341	7050	No
$v_{FO} = v_F - v_R$	4113	7050	No
v_R	2228	4200	No
v_3 or v_{av34}	2262 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4079$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4079	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 27.6 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.434$	
Space mean speed in ramp influence area,	$S_R = 55.0$	mph
Space mean speed in outer lanes,	$S_0 = 66.4$	mph
Space mean speed for all vehicles,	$S = 58.6$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: McKinley Ave slip on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4364	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	403	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	356	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4364	403	356	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1148	106	94	v
Trucks and buses	10	3	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.985	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4823	431	393	pcph

Estimation of V12 Merge Areas

$$L = 2261.22 \text{ (Equation 13-6 or 13-7)}$$

$$EQ$$

$$P = 0.594 \text{ Using Equation 1}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 2866 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5254	7050	No
v_3 or v_{av34}	1957 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2866$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3297	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 27.2 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.366$	
Space mean speed in ramp influence area,	$S_R = 56.6$	mph
Space mean speed in outer lanes,	$S_0 = 59.8$	mph
Space mean speed for all vehicles,	$S = 57.7$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: Airport Way on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3722	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	847	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1536	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2230	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3722	847	1536	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	979	223	404	v
Trucks and buses	10	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4114	900	1633	pcph

Estimation of V12 Merge Areas

$$L = 9395.86 \text{ (Equation 13-6 or 13-7)}$$

$$EQ$$

$$P = 0.741 \text{ Using Equation 3}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 3049 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5014	7050	No
v_3 or v_{av34}	1065 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3049$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3949	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 32.1 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.463$	
Space mean speed in ramp influence area,	$S_R = 54.3$	mph
Space mean speed in outer lanes,	$S_0 = 63.0$	mph
Space mean speed for all vehicles,	$S = 56.0$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: Airport Way off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4538	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	924	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	395	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2350	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4538	924	395	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1194	243	104	v
Trucks and buses	10	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5016	982	420	pcph

Estimation of V12 Diverge Areas

$$L = 3758.86 \text{ (Equation 13-12 or 13-13)}$$

$$EQ$$

$$P = 0.629 \text{ Using Equation 6}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 3521 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5016	7050	No
$v_{FO} = v_F - v_R$	4034	7050	No
v_R	982	2100	No
$v_3 \text{ or } v_{av34}$	1495 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3521$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3521	4400	No

Level of Service Determination (if not F)

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 33.2$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence D			

Speed Estimation

Intermediate speed variable,	$D = 0.321$	
Space mean speed in ramp influence area,	$S_R = 57.6$	mph
Space mean speed in outer lanes,	$S_0 = 69.4$	mph
Space mean speed for all vehicles,	$S = 60.7$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: Union Rd off-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4569	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1536	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	847	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2230	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4569	1536	847	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1202	404	223	v
Trucks and buses	10	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5050	1633	900	pcph

Estimation of V12 Diverge Areas

$$L = 14276.19 \text{ Equation 13-12 or 13-13}$$

$$EQ$$

$$P = 0.559 \text{ Using Equation 5}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 3542 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5050	7050	No
$v_{FO} = v_F - v_R$	3417	7050	No
v_R	1633	2100	No
$v_3 \text{ or } v_{av34}$	1508 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3542$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3542	4400	No

Level of Service Determination (if not F)

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 21.2$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence C			

Speed Estimation

Intermediate speed variable,	$D_S = 0.380$	
Space mean speed in ramp influence area,	$S_R = 56.3$	mph
Space mean speed in outer lanes,	$S_0 = 69.3$	mph
Space mean speed for all vehicles,	$S = 59.6$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 06/27/2014
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: WB SR 120
Junction: Union Rd slip on-ramp
Jurisdiction: District 10
Analysis Year: Cumulative Plus Project
Description: Manteca FEZ

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4143	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	395	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	924	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2350	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4143	395	924	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1090	104	243	v
Trucks and buses	10	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4579	420	982	pcph

Estimation of V12 Merge Areas

$$L = 5030.74 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.659 \text{ Using Equation 3}$$

FM

$$v_{12} = v_F (P_{FM}) = 3015 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	4999	7050	No
v ₃ or v _{av34}	1564 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ /2		No	
If yes, v _{12A} = 3015		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{R12}	3435	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 27.1 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M _S = 0.362	
Space mean speed in ramp influence area,	S _R = 56.7	mph
Space mean speed in outer lanes,	S ₀ = 61.2	mph
Space mean speed for all vehicles,	S = 58.0	mph

Major Street **Airport Way**
Minor Street **Atherton Dr**

Project **FEZ EIR**
Scenario **Cumulative Plus Project**
Peak Hour **AM**

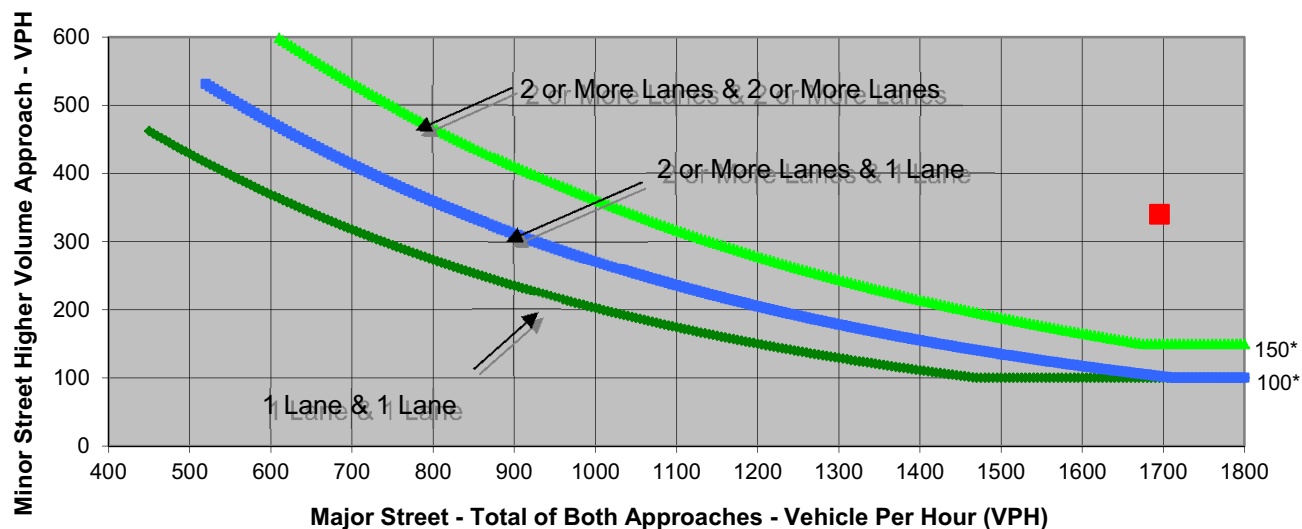
Turn Movement Volumes

	NB	SB	EB	WB
Left	10	170	320	20
Through	1,119	246	10	40
Right	20	160	10	210
Total	1,119	576	340	270

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Atherton Dr	Warrant Met
Number of Approach Lanes	2	2	<u>YES</u>
Traffic Volume (VPH) *	1,695	340	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Atherton Dr**

Project **FEZ EIR**
Scenario **Cumulative Plus Project**
Peak Hour **PM**

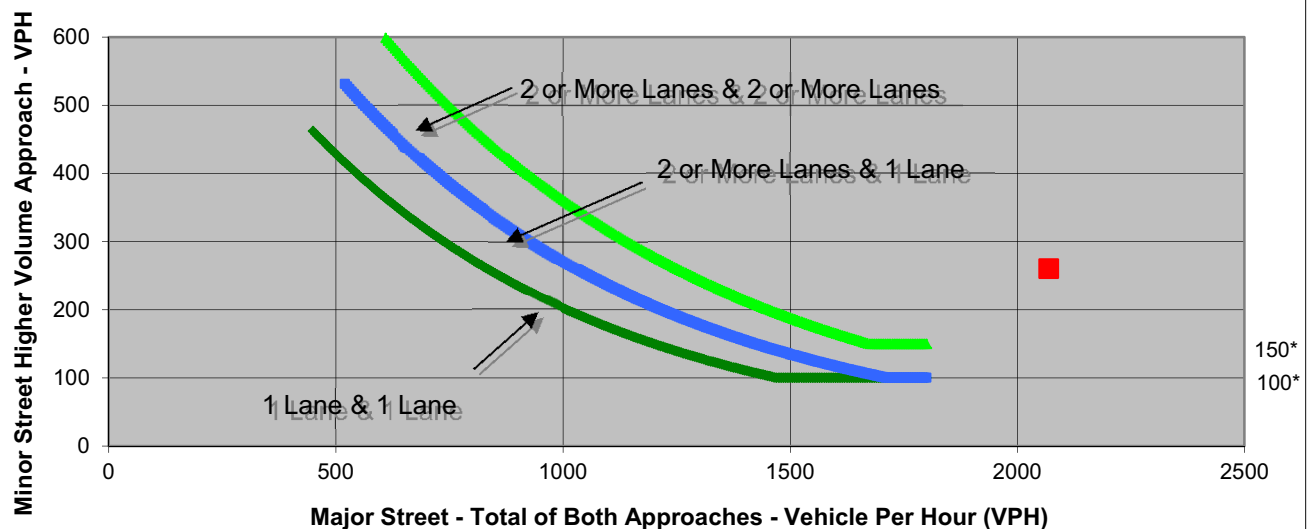
Turn Movement Volumes

	NB	SB	EB	WB
Left	10	300	220	50
Through	382	1,107	20	70
Right	20	280	10	140
Total	382	1,687	250	260

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street	Minor Street	Warrant Met
	Airport Way	Atherton Dr	
Number of Approach Lanes	2	2	<u>YES</u>
Traffic Volume (VPH) *	2,069	260	
* Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street **Airport Way**
Minor Street **Wawona Street**

Project **FEZ EIR**
Scenario **Cumulative Plus Project**
Peak Hour **AM**

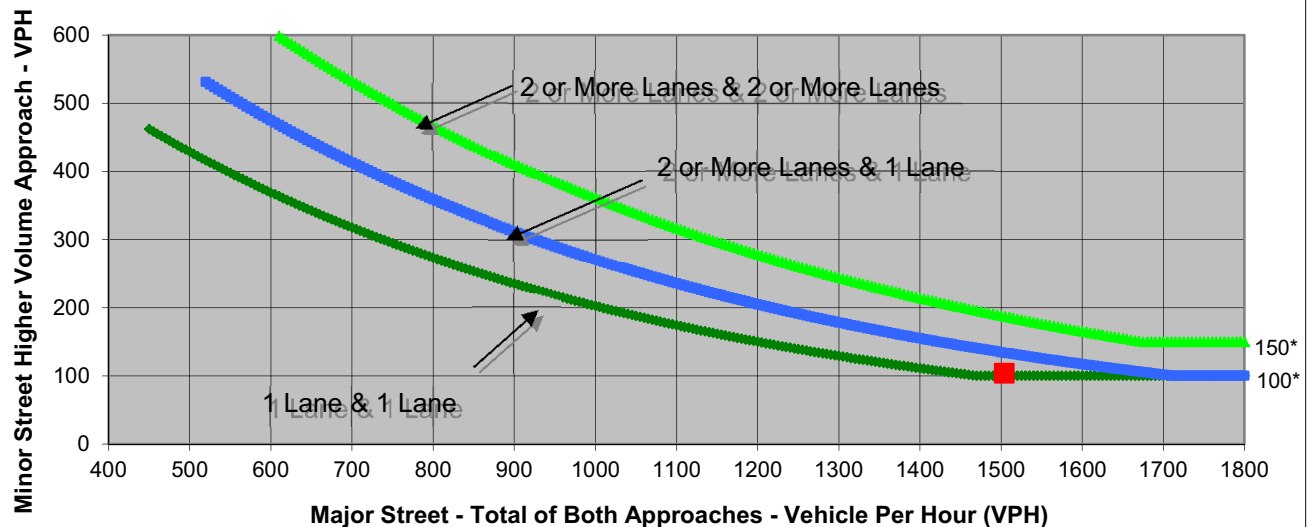
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	60	0	54
Through	799	514	0	0
Right	131	0	0	50
Total	930	574	0	104

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Wawona Street	Warrant Met
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	1,504	104	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Airport Way**
Minor Street **Wawona Street**

Project **FEZ EIR**
Scenario **Cumulative Plus Project**
Peak Hour **PM**

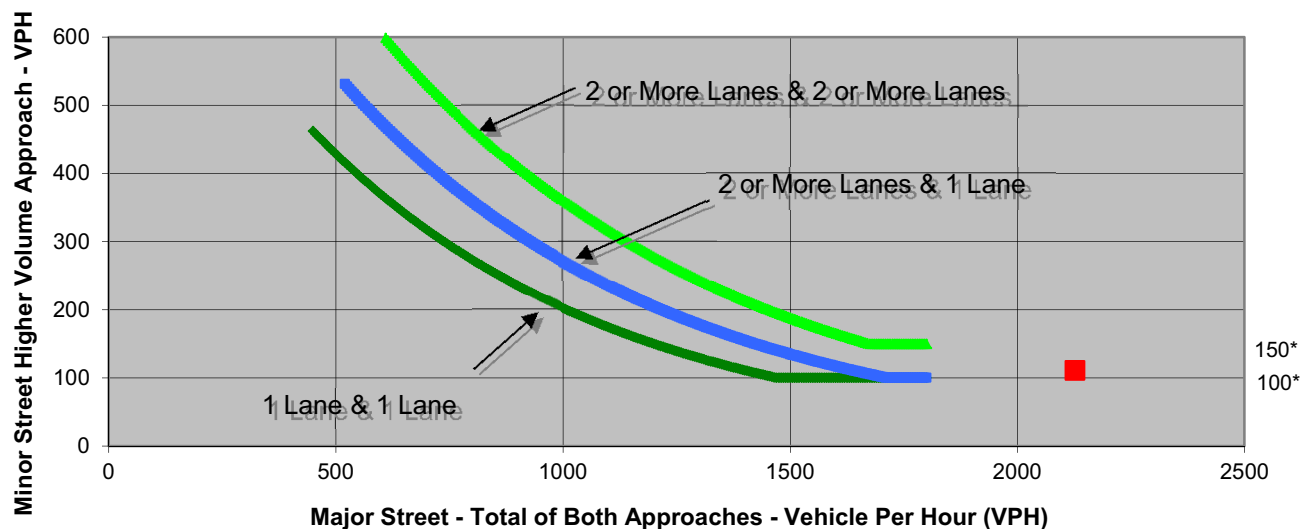
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	60	0	71
Through	939	1,054	0	0
Right	74	0	0	40
Total	1,013	1,114	0	111

Major Street Direction

X	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Airport Way	Minor Street Wawona Street	Warrant Met
Number of Approach Lanes	2	1	<u>YES</u>
Traffic Volume (VPH) *	2,127	111	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

1: Atherton Dr & Airport Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Delay / Veh (s)	1887.0	2446.7	1400.2	955.7	792.6	300.7	139.1	88.6	41.8	136.5	2.1	1.2
Vehicles Exited	0	0	0	2	4	50	2	259	4	33	54	31
Hourly Exit Rate	0	0	0	8	16	200	8	1036	16	132	216	124
Input Volume	337	11	11	21	42	316	11	1178	21	179	271	168
% of Volume	0	0	0	38	38	63	73	88	76	74	80	74
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Atherton Dr & Airport Way Performance by movement

Movement	All
Delay / Veh (s)	268.3
Vehicles Exited	439
Hourly Exit Rate	1756
Input Volume	2566
% of Volume	68
Denied Entry Before	0
Denied Entry After	0

2: SR 120 EB Ramps & Airport Way Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	349.5	275.0	112.8	67.1	12.2	265.5	77.2	116.3
Vehicles Exited	69	1	22	228	92	33	99	544
Hourly Exit Rate	276	4	88	912	368	132	396	2176
Input Volume	442	11	126	1362	505	189	481	3116
% of Volume	62	36	70	67	73	70	82	70
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

3: SR 120 WB Ramps & Airport Way Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	58.6	60.5	35.0	97.1	64.5	49.8	15.1	52.2
Vehicles Exited	42	3	159	100	189	114	107	714
Hourly Exit Rate	168	12	636	400	756	456	428	2856
Input Volume	179	11	627	600	1167	491	432	3507
% of Volume	94	109	101	67	65	93	99	81
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

4: Daniels St & Airport Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Delay / Veh (s)	35.3	31.5	11.1	67.6	32.8	10.6	40.3	22.4	6.0	50.3	30.0	9.1
Vehicles Exited	17	8	48	74	14	18	80	173	91	33	104	36
Hourly Exit Rate	68	32	192	296	56	72	320	692	364	132	416	144
Input Volume	62	35	185	316	59	74	426	895	474	147	421	145
% of Volume	110	91	104	94	95	97	75	77	77	90	99	99
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

4: Daniels St & Airport Way Performance by movement

Movement	All
Delay / Veh (s)	28.6
Vehicles Exited	696
Hourly Exit Rate	2784
Input Volume	3239
% of Volume	86
Denied Entry Before	0
Denied Entry After	0

9: SR-120 EB On-Ramp & McKinley Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBT	SBR	All
Delay / Veh (s)	26.8	28.9	14.1	27.6	7.5	6.2	3.7	20.3
Vehicles Exited	61	3	151	535	112	75	50	987
Hourly Exit Rate	244	12	604	2140	448	300	200	3948
Input Volume	252	11	632	2122	453	298	211	3979
% of Volume	97	109	96	101	99	101	95	99
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

10: SR-120 WB Off-Ramp & McKinley Avenue Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBT	SBR	All
Delay / Veh (s)	24.5	29.9	11.7	9.9	18.9	5.6	3.0	14.9
Vehicles Exited	49	3	219	134	463	78	20	966
Hourly Exit Rate	196	12	876	536	1852	312	80	3864
Input Volume	200	11	895	532	1842	319	78	3877
% of Volume	98	109	98	101	101	98	103	100
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

11: Daniels St Extension & McKinley Avenue Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	18.0	8.9	5.3	4.4	19.8	11.2	6.8
Vehicles Exited	13	1	320	42	6	82	464
Hourly Exit Rate	52	4	1280	168	24	328	1856
Input Volume	49	3	1307	163	17	337	1876
% of Volume	106	133	98	103	141	97	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Delay / Veh (s)	134.6
Vehicles Exited	2202
Hourly Exit Rate	8808
Input Volume	42518
% of Volume	21
Denied Entry Before	0
Denied Entry After	0

Intersection: 1: Atherton Dr & Airport Way

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	1886	1877	113	715	855	119	1090	912	48	195	258	130
Average Queue (ft)	1429	1347	72	422	564	18	723	587	10	146	113	36
95th Queue (ft)	1932	1909	176	908	1017	117	1228	966	89	239	380	209
Link Distance (ft)	3369	3369		3091	3091		2010	2010			672	672
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			340			210			210	175		
Storage Blk Time (%)				8			58	29	0	32	0	0
Queuing Penalty (veh)				2			6	6	0	41	0	1

Intersection: 1: Atherton Dr & Airport Way

Movement	SB
Directions Served	R
Maximum Queue (ft)	44
Average Queue (ft)	6
95th Queue (ft)	84
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	375
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 2: SR 120 EB Ramps & Airport Way

Movement	EB	EB	B20	NB	NB	SB	SB
Directions Served	LT	R	T	T	R	L	T
Maximum Queue (ft)	1572	722	415	743	746	274	1164
Average Queue (ft)	1112	222	88	699	408	247	667
95th Queue (ft)	1846	725	493	740	899	327	1357
Link Distance (ft)	1670		1569	672	672		1414
Upstream Blk Time (%)	15			40	4		5
Queuing Penalty (veh)	0			364	39		35
Storage Bay Dist (ft)		700				250	
Storage Blk Time (%)	49	0				49	1
Queuing Penalty (veh)	61	1				234	2

Intersection: 3: SR 120 WB Ramps & Airport Way

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	T	T	R
Maximum Queue (ft)	474	482	275	1428	412	293
Average Queue (ft)	207	330	260	1306	343	159
95th Queue (ft)	533	533	310	1604	463	310
Link Distance (ft)	1716			1414	398	398
Upstream Blk Time (%)				11	8	0
Queuing Penalty (veh)				196	37	1
Storage Bay Dist (ft)		500	250			
Storage Blk Time (%)	0	2	24	12		
Queuing Penalty (veh)	1	5	283	69		

Intersection: 4: Daniels St & Airport Way

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	L	T	R	L	L	T	T
Maximum Queue (ft)	46	52	43	106	216	211	137	69	142	157	242	265
Average Queue (ft)	15	32	20	63	147	124	43	29	95	111	145	163
95th Queue (ft)	46	57	51	111	270	248	148	74	151	167	255	275
Link Distance (ft)		1286	1286				1475				398	398
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			325	350	350		350	200	200		
Storage Blk Time (%)					1	1				0	4	0
Queuing Penalty (veh)					1	1				0	15	2

Intersection: 4: Daniels St & Airport Way

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	T	T	R
Maximum Queue (ft)	163	185	280	244	79
Average Queue (ft)	78	111	127	107	42
95th Queue (ft)	167	192	287	260	84
Link Distance (ft)			3282	3282	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300	175			250
Storage Blk Time (%)	0	2	5	0	
Queuing Penalty (veh)	0	4	8	1	

Intersection: 9: SR-120 EB On-Ramp & McKinley Ave

Movement	EB	EB	EB	EB	EB	NB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	R	R	T	T	T	R	T	T
Maximum Queue (ft)	124	117	98	109	124	270	524	579	80	59	82
Average Queue (ft)	78	66	63	73	95	60	316	380	21	18	34
95th Queue (ft)	123	114	101	112	131	255	578	643	221	58	90
Link Distance (ft)			1528	1528		2467	2467	2467	2467	955	955
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	725	725			725						
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 10: SR-120 WB Off-Ramp & McKinley Avenue

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	R	T	T	R	R	T	T	R	R
Maximum Queue (ft)	72	87	136	156	73	103	230	236	27	72	14	17
Average Queue (ft)	40	56	81	87	32	56	155	149	6	27	2	5
95th Queue (ft)	81	93	140	156	78	113	250	240	27	73	13	17
Link Distance (ft)		1876	1876		955	955	955		893	893		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	700			700				750			500	500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 11: Daniels St Extension & McKinley Avenue

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	LR	T	T	R	L	T	T
Maximum Queue (ft)	27	47	104	128	57	43	86	100
Average Queue (ft)	7	23	47	72	21	17	46	60
95th Queue (ft)	28	49	110	137	70	44	89	106
Link Distance (ft)		1409	893	893			661	661
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200				200	200		
Storage Blk Time (%)				0				
Queuing Penalty (veh)				0				

Network Summary

Network wide Queuing Penalty: 1417

1: Atherton Dr & Airport Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Delay / Veh (s)	959.0	872.1	336.5	60.9	280.3	15.3	16.8	4.5	0.5	10.1	1.2	1.4
Vehicles Exited	18	1	2	14	16	53	2	101	6	45	193	46
Hourly Exit Rate	72	4	8	56	64	212	8	404	24	180	772	184
Input Volume	232	21	11	53	74	211	11	402	21	316	1201	295
% of Volume	31	19	73	106	86	100	73	100	114	57	64	62
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Atherton Dr & Airport Way Performance by movement

Movement	All
Delay / Veh (s)	89.0
Vehicles Exited	497
Hourly Exit Rate	1988
Input Volume	2848
% of Volume	70
Denied Entry Before	0
Denied Entry After	0

2: SR 120 EB Ramps & Airport Way Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	185.2	263.1	70.8	87.9	9.0	125.2	82.1	101.4
Vehicles Exited	116	2	114	116	49	88	162	647
Hourly Exit Rate	464	8	456	464	196	352	648	2588
Input Volume	663	11	579	620	242	639	1198	3952
% of Volume	70	73	79	75	81	55	54	65
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

3: SR 120 WB Ramps & Airport Way Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	351.5	364.3	371.7	168.2	87.3	32.6	6.4	122.6
Vehicles Exited	58	2	63	30	182	193	94	622
Hourly Exit Rate	232	8	252	120	728	772	376	2488
Input Volume	432	11	531	179	1087	1405	642	4287
% of Volume	54	73	47	67	67	55	59	58
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

4: Daniels St & Airport Way Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Delay / Veh (s)	62.5	145.2	203.3	785.2	511.3	465.4	164.2	37.4	5.8	503.3	464.0	318.8
Vehicles Exited	92	23	138	39	12	19	102	85	56	12	109	44
Hourly Exit Rate	368	92	552	156	48	76	408	340	224	48	436	176
Input Volume	404	132	752	463	121	189	659	591	368	95	832	291
% of Volume	91	70	73	34	40	40	62	58	61	51	52	60
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

4: Daniels St & Airport Way Performance by movement

Movement	All
Delay / Veh (s)	258.5
Vehicles Exited	731
Hourly Exit Rate	2924
Input Volume	4897
% of Volume	60
Denied Entry Before	0
Denied Entry After	0

9: SR-120 EB On-Ramp & McKinley Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBT	SBR	All
Delay / Veh (s)	15.9	16.8	15.2	15.0	2.6	33.1	12.3	16.7
Vehicles Exited	17	3	471	276	79	200	204	1250
Hourly Exit Rate	68	12	1884	1104	316	800	816	5000
Input Volume	68	11	1926	1058	326	795	800	4984
% of Volume	100	109	98	104	97	101	102	100
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

10: SR-120 WB Off-Ramp & McKinley Avenue Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBT	SBR	All
Delay / Veh (s)	21.0	21.7	2.2	10.7	10.8	16.5	6.1	13.2
Vehicles Exited	119	3	73	53	238	286	58	830
Hourly Exit Rate	476	12	292	212	952	1144	232	3320
Input Volume	484	11	295	200	926	1111	235	3262
% of Volume	98	109	99	106	103	103	99	102
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

Total Network Performance

Delay / Veh (s)	207.7
Vehicles Exited	2436
Hourly Exit Rate	9744
Input Volume	48432
% of Volume	20
Denied Entry Before	0
Denied Entry After	32

Intersection: 1: Atherton Dr & Airport Way

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	1215	1062	147	263	112	23	68	36	3	98	28	1
Average Queue (ft)	883	749	57	160	63	6	19	11	0	51	8	0
95th Queue (ft)	1254	1208	161	336	151	25	102	60	4	120	84	3
Link Distance (ft)	4361	4361		4052	4052		683	683			658	658
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			340			210			210	175		
Storage Blk Time (%)				6			0			1		
Queuing Penalty (veh)				3			0			5		

Intersection: 1: Atherton Dr & Airport Way

Movement	SB
Directions Served	R
Maximum Queue (ft)	15
Average Queue (ft)	3
95th Queue (ft)	16
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	375
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: SR 120 EB Ramps & Airport Way

Movement	EB	EB	B20	NB	NB	SB	SB
Directions Served	LT	R	T	T	R	L	T
Maximum Queue (ft)	1689	725	1734	635	455	274	1423
Average Queue (ft)	1333	449	596	479	145	262	1241
95th Queue (ft)	2145	916	2014	712	504	302	1667
Link Distance (ft)	1670		2546	658	658		1414
Upstream Blk Time (%)	22		4	9	4		12
Queuing Penalty (veh)	0		0	40	16		214
Storage Bay Dist (ft)		700				250	
Storage Blk Time (%)	33	0				29	14
Queuing Penalty (veh)	192	3				345	91

Intersection: 3: SR 120 WB Ramps & Airport Way

Movement	WB	WB	B23	NB	NB	SB	SB
Directions Served	LT	R	T	L	T	T	R
Maximum Queue (ft)	1811	525	2545	254	1350	421	236
Average Queue (ft)	1559	497	987	171	1032	408	89
95th Queue (ft)	2229	622	2909	305	1657	431	256
Link Distance (ft)	1716		3396		1414	400	400
Upstream Blk Time (%)	45		6		8	20	0
Queuing Penalty (veh)	0		0		105	207	2
Storage Bay Dist (ft)		500		250			
Storage Blk Time (%)	31	35		8	37		
Queuing Penalty (veh)	167	155		87	66		

Existing Plus Project Mitigations Technical Calculations

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 2/9/2015
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: McKinley Ave off-ramp
Jurisdiction: District 10
Analysis Year: E+P with Mitigations
Description: FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3878	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	150	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane	800	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3878	150		vph
Peak-hour factor, PHF	0.95	0.95		
Peak 15-min volume, v15	1021	39		v
Trucks and buses	10	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4286	160	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 4286 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4286	4700	No
$v_{FO} = v_F - v_R$	4126	4700	No
v_R	160	4200	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4286$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4286	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 29.4 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.247$	
Space mean speed in ramp influence area,	$S_R = 59.3$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 59.3$	mph

Phone: Fax:
E-mail:

----- Merge Analysis -----

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 02/09/2015
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: McKinley Ave loop on-ramp
Jurisdiction: District 10
Analysis Year: B+P with Mitigations
Description: FEZ

----- Freeway Data -----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3728	vph

----- On Ramp Data -----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	20	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

----- Adjacent Ramp Data (if one exists) -----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

----- Conversion to pc/h Under Base Conditions -----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3728	20		vph
Peak-hour factor, PHF	0.95	0.95		
Peak 15-min volume, v15	981	5		v
Trucks and buses	10	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4120	21	pcph

Estimation of V12 Merge Areas

L = 8518.85 (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v (P) = 4120 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	4141	4700	No
FO			
v or v	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v or v	> 2700 pc/h?	No	
3 av34			
Is v or v	> 1.5 v /2	No	
3 av34	12		
If yes, v	= 4120	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	4141	4600	No
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 34.3 pc/mi/ln

R R 12 A

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M = 0.533	
	S	
Space mean speed in ramp influence area,	S = 52.7	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 52.7	mph

Phone: Fax:
E-mail:

----- Merge Analysis -----

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 2/9/2015
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: McKinley Ave slip on-ramp
Jurisdiction: District 10
Analysis Year: E+P Mitigations
Description: FEZ

----- Freeway Data -----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3748	vph

----- On Ramp Data -----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	30	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

----- Adjacent Ramp Data (if one exists) -----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

----- Conversion to pc/h Under Base Conditions -----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3748	30		vph
Peak-hour factor, PHF	0.95	0.95		
Peak 15-min volume, v15	986	8		v
Trucks and buses	10	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4143	32	pcph

Estimation of V12 Merge Areas

$L = 10575.37$ Equation 13-6 or 13-7)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 4143$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4175	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4143$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4175	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 34.3$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.515$	
Space mean speed in ramp influence area,	$S_R = 53.2$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 53.2$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Caltrans
Date performed: 2/9/2015
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: EB SR 120
Junction: Airport Way off-ramp
Jurisdiction: District 10
Analysis Year: E+P Mitigations
Description: FEZ

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3778	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	554	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3778	554		vph
Peak-hour factor, PHF	0.95	0.95		
Peak 15-min volume, v15	994	146		v
Trucks and buses	10	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4176	595	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) \frac{P}{FD} = 4176 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4176	4700	No
$v_{FO} = v_F - v_R$	3581	4700	No
v_R	595	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4176$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4176	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 \frac{L}{D} = 38.8 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$D = 0.287$	
Space mean speed in ramp influence area,	$S_R = 58.4$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 58.4$	mph

Leisch Method for Weaving Analysis

Data Input

Number of Entering Mainline Lanes	N _b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	2,230

Total Weaving Section (V)

Volume (vph)*	3,682
Truck Percentage	10.0%
PCE for Trucks	1.5
Volume (pcph)	3,866

On-ramp to Mainline (W₁)

Volume (vph)*	412
Truck Percentage	4.0%
PCE for Trucks	1.5
Volume (pcph)	420

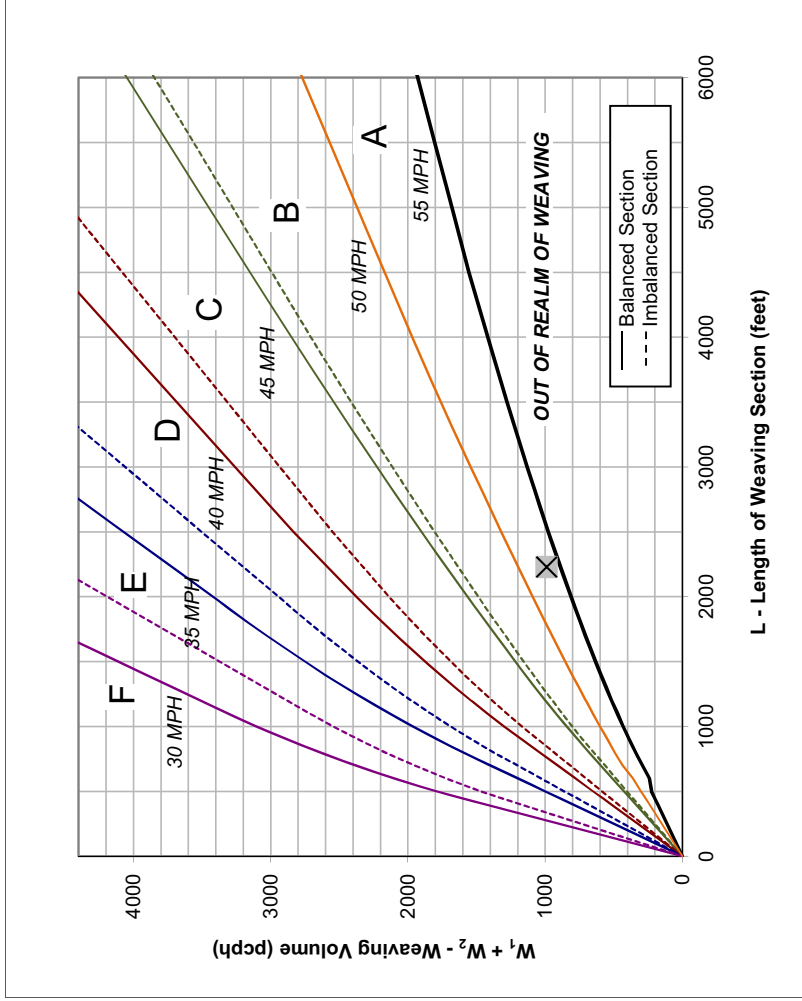
Mainline to Off-ramp (W₂)

Volume (vph)*	559
Truck Percentage	4.0%
PCE for Trucks	1.5
Volume (pcph)	570

Project Information

Project	FEZ EIR
Scenario	E+P Mitigations
Freeway	SR 120
On-ramp	Airport Way
Off-ramp	Union Rd

* Assumes 44% of on-ramp traffic does not enter weaving section

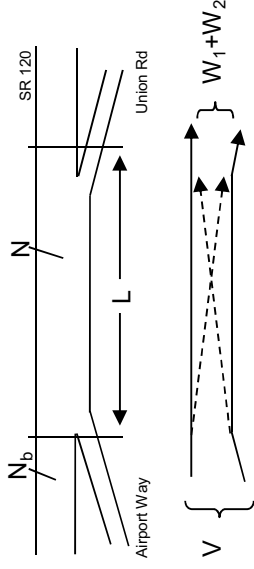


The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?
[If optional exit lane, then "Y". Otherwise "N".]
2. In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?

50 MPH and **55 MPH**

If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.

3. Interpolated Weaving Speed (S_w , mph)

53.3

4. Weaving Intensity Factor (k)

1.00

5. Service Volume (SV , pcph)

$$SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$$

1,289

6. Level of Service (LOS)

D

Cumulative Plus Project Mitigations Technical Calculations

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project Mitigation
AM Peak Hour

Intersection 2

Airport Way/SR 120 EB Ramps

Side Street Stop

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	331	323	97.7%	15.1	3.1	C
	Right Turn	126	126	100.1%	14.3	4.3	B
	Subtotal	457	449	98.3%	14.9	3.4	B
SB	Left Turn						
	Through	120	122	101.3%	5.3	0.6	A
	Right Turn	47	43	91.7%	3.3	0.6	A
	Subtotal	167	165	98.6%	4.8	0.4	A
EB	Left Turn	111	112	100.5%	26.3	1.9	D
	Through	3	4	126.7%	24.1	13.0	C
	Right Turn	32	35	108.8%	4.7	0.7	A
	Subtotal	146	150	102.8%	21.3	1.7	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		770	764	99.2%	14.0	2.0	B

Intersection 3

Airport Way/SR 120 WB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	292	293	100.5%	14.6	2.2	B
	Right Turn	150	144	95.9%	11.0	2.5	B
	Subtotal	442	437	98.9%	13.4	2.3	B
SB	Left Turn						
	Through	123	120	97.4%	7.7	1.7	A
	Right Turn	108	108	99.5%	4.2	0.6	A
	Subtotal	231	227	98.4%	6.0	1.0	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	45	45	100.7%	24.2	6.0	C
	Through	3	2	80.0%	17.7	16.0	B
	Right Turn	157	158	100.8%	21.1	3.7	C
	Subtotal	205	206	100.4%	21.8	3.9	C
Total		878	871	99.1%	13.5	1.4	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project Mitigation
AM Peak Hour

Intersection 4

Airport Way/Daniels St

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	107	110	102.3%	46.7	7.0	D
	Through	224	218	97.3%	30.3	4.9	C
	Right Turn	118	114	96.7%	16.2	3.1	B
	Subtotal	449	442	98.3%	30.7	4.1	C
SB	Left Turn	37	33	90.0%	60.5	9.1	E
	Through	105	100	95.4%	34.0	4.2	C
	Right Turn	36	39	108.6%	12.8	2.1	B
	Subtotal	178	173	97.0%	34.5	3.6	C
EB	Left Turn	16	14	88.1%	51.7	9.7	D
	Through	9	8	91.1%	49.1	14.4	D
	Right Turn	46	45	97.2%	8.4	1.3	A
	Subtotal	71	67	94.4%	22.2	2.3	C
WB	Left Turn	79	80	101.3%	44.6	5.0	D
	Through	15	12	80.7%	40.8	11.1	D
	Right Turn	18	19	103.9%	14.6	5.1	B
	Subtotal	112	111	98.9%	39.2	4.0	D
Total		810	792	97.8%	32.0	2.7	C

Intersection 0

Airport Way/Daniels St

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
	Right Turn						
	Subtotal						
Total							

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project Mitigation
PM Peak Hour

Intersection 2

Airport Way/SR 120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	151	151	100.1%	9.6	1.6	A
	Right Turn	61	64	104.3%	3.8	0.4	A
	Subtotal	212	215	101.3%	7.9	1.2	A
SB	Left Turn						
	Through	299	300	100.2%	13.8	1.8	B
	Right Turn	160	149	93.1%	8.9	0.6	A
	Subtotal	459	449	97.7%	12.2	1.2	B
EB	Left Turn	118	116	98.5%	16.6	1.1	B
	Through	3	3	96.7%	12.1	5.7	B
	Right Turn	145	141	97.4%	11.5	1.1	B
	Subtotal	266	260	97.9%	13.8	0.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		937	924	98.6%	11.7	0.7	B

Intersection 3

Airport Way/SR 120 WB Ramps-SR120 EB Ramps

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	224	223	99.6%	11.9	2.2	B
	Right Turn	45	44	96.9%	6.6	1.5	A
	Subtotal	269	267	99.1%	11.1	2.0	B
SB	Left Turn						
	Through	351	344	97.9%	12.8	0.8	B
	Right Turn	116	116	99.6%	6.0	0.5	A
	Subtotal	467	459	98.3%	11.1	0.6	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	108	110	101.6%	16.9	0.9	B
	Through	3	3	93.3%	12.6	7.8	B
	Right Turn	133	132	99.1%	9.8	1.6	A
	Subtotal	244	244	100.1%	13.0	1.1	B
Total		980	970	99.0%	11.6	0.8	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

FEZ EIR
Cumulative Plus Project Mitigation
PM Peak Hour

Intersection 4

Airport Way/Daniels St

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn	117	116	99.0%	65.6	5.7	E
	Through	147	149	101.4%	45.8	4.4	D
	Right Turn	92	87	94.0%	21.1	6.1	C
	Subtotal	356	351	98.7%	46.4	3.1	D
SB	Left Turn	24	24	100.0%	92.2	13.2	F
	Through	208	207	99.3%	75.4	5.3	E
	Right Turn	73	73	99.6%	28.5	6.0	C
	Subtotal	305	303	99.4%	65.4	4.1	E
EB	Left Turn	101	101	100.2%	67.3	9.9	E
	Through	33	35	106.7%	73.6	15.1	E
	Right Turn	143	144	100.7%	15.4	2.1	B
	Subtotal	277	280	101.2%	41.5	5.5	D
WB	Left Turn	116	107	92.4%	60.0	7.3	E
	Through	30	31	102.7%	57.6	9.8	E
	Right Turn	47	48	102.8%	21.8	4.5	C
	Subtotal	193	186	96.5%	49.7	4.5	D
Total		1,131	1,121	99.1%	50.8	1.9	D

Intersection 0

/

Signal

Direction	Movement	Volume (vehicles)			Total Delay (sec/veh)		
		Demand	Served	% Served	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
	Right Turn						
	Subtotal						
Total							

HCM Signalized Intersection Capacity Analysis

5: Wawona St. & Airport Way

C+P Mitigated Conditions
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	54	50	799	131	60	514
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	1.00		0.95	1.00	1.00	0.95
Frt	0.94		1.00	0.85	1.00	1.00
Flt Protected	0.97		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1698		3438	1538	1719	3438
Flt Permitted	0.97		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1698		3438	1538	1719	3438
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	65	60	963	158	72	619
RTOR Reduction (vph)	51	0	0	76	0	0
Lane Group Flow (vph)	74	0	963	82	72	619
Heavy Vehicles (%)	2%	2%	5%	5%	5%	5%
Turn Type				Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	6.7		23.7	23.7	3.2	30.9
Effective Green, g (s)	6.7		23.7	23.7	3.2	30.9
Actuated g/C Ratio	0.15		0.52	0.52	0.07	0.68
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	249		1787	799	121	2330
v/s Ratio Prot	c0.04		c0.28		c0.04	0.18
v/s Ratio Perm				0.05		
v/c Ratio	0.30		0.54	0.10	0.60	0.27
Uniform Delay, d1	17.3		7.3	5.6	20.6	2.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7		0.3	0.1	7.6	0.1
Delay (s)	18.0		7.6	5.6	28.2	3.0
Level of Service	B		A	A	C	A
Approach Delay (s)	18.0		7.3			5.6
Approach LOS	B		A			A
Intersection Summary						
HCM Average Control Delay			7.4	HCM Level of Service		A
HCM Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			45.6	Sum of lost time (s)		12.0
Intersection Capacity Utilization			41.5%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: Yosemite Ave & McKinley Ave

C+P Mitigated Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	170	64	340	370	70	141	182	50	160	521	140
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	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2801	3085	1509	3433	2935	1583	1736	1863	1583	1641	1863	1429
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	2801	3085	1509	3433	2935	1583	1736	1863	1583	1641	1863	1429
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	179	67	358	389	74	148	192	53	168	548	147
RTOR Reduction (vph)	0	0	56	0	0	52	0	0	36	0	0	73
Lane Group Flow (vph)	21	179	11	358	389	22	148	192	17	168	548	74
Heavy Vehicles (%)	25%	17%	7%	2%	23%	2%	4%	2%	2%	10%	2%	13%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	2.0	13.6	13.6	12.8	24.4	24.4	11.5	27.5	27.5	13.6	29.6	29.6
Effective Green, g (s)	2.0	13.6	13.6	12.8	24.4	24.4	11.5	27.5	27.5	13.6	29.6	29.6
Actuated g/C Ratio	0.02	0.16	0.16	0.15	0.29	0.29	0.14	0.33	0.33	0.16	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	67	502	246	526	858	463	239	614	521	267	660	507
v/s Ratio Prot	0.01	0.06		c0.10	c0.13		0.09	0.10		c0.10	c0.29	
v/s Ratio Perm			0.01			0.01			0.01			0.05
v/c Ratio	0.31	0.36	0.04	0.68	0.45	0.05	0.62	0.31	0.03	0.63	0.83	0.15
Uniform Delay, d1	40.1	31.1	29.5	33.4	24.1	21.2	33.9	20.9	19.0	32.6	24.7	18.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.4	0.1	3.6	0.4	0.0	4.7	0.3	0.0	4.6	8.7	0.1
Delay (s)	42.7	31.5	29.5	37.0	24.5	21.2	38.7	21.2	19.0	37.2	33.4	18.5
Level of Service	D	C	C	D	C	C	D	C	B	D	C	B
Approach Delay (s)		31.9			29.7			27.5			31.6	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			30.3				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			83.5				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			63.0%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Wawona St. & Airport Way

C+P Mitigated Conditions
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	71	40	939	74	60	1054
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	1.00		0.95	1.00	1.00	0.95
Frt	0.95		1.00	0.85	1.00	1.00
Flt Protected	0.97		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1718		3505	1568	1770	3539
Flt Permitted	0.97		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1718		3505	1568	1770	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	43	1021	80	65	1146
RTOR Reduction (vph)	37	0	0	38	0	0
Lane Group Flow (vph)	83	0	1021	42	65	1146
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Turn Type				Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	6.9		24.4	24.4	3.2	31.6
Effective Green, g (s)	6.9		24.4	24.4	3.2	31.6
Actuated g/C Ratio	0.15		0.52	0.52	0.07	0.68
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	255		1839	823	122	2405
v/s Ratio Prot	c0.05		c0.29		0.04	c0.32
v/s Ratio Perm				0.03		
v/c Ratio	0.33		0.56	0.05	0.53	0.48
Uniform Delay, d1	17.7		7.4	5.4	20.9	3.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8		0.4	0.0	4.4	0.1
Delay (s)	18.5		7.8	5.4	25.3	3.7
Level of Service	B		A	A	C	A
Approach Delay (s)	18.5		7.6			4.8
Approach LOS	B		A			A
Intersection Summary						
HCM Average Control Delay			6.8	HCM Level of Service		A
HCM Volume to Capacity ratio			0.52			
Actuated Cycle Length (s)			46.5	Sum of lost time (s)		12.0
Intersection Capacity Utilization			45.7%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: Yosemite Ave & McKinley Ave

C+P Mitigated Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	460	181	90	250	180	24	601	400	140	274	50
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	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2382	3223	1583	3367	3112	1583	1770	1792	1583	1770	1863	1429
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	2382	3223	1583	3367	3112	1583	1770	1792	1583	1770	1863	1429
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)	210	568	223	111	309	222	30	742	494	173	338	62
RTOR Reduction (vph)	0	0	174	0	0	187	0	0	163	0	0	29
Lane Group Flow (vph)	210	568	49	111	309	35	30	742	331	173	338	33
Heavy Vehicles (%)	47%	12%	2%	4%	16%	2%	2%	6%	2%	2%	2%	13%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	11.5	21.7	21.7	5.4	15.6	15.6	3.5	44.2	44.2	11.6	52.3	52.3
Effective Green, g (s)	11.5	21.7	21.7	5.4	15.6	15.6	3.5	44.2	44.2	11.6	52.3	52.3
Actuated g/C Ratio	0.12	0.22	0.22	0.05	0.16	0.16	0.04	0.45	0.45	0.12	0.53	0.53
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	707	347	184	491	250	63	801	707	208	985	756
v/s Ratio Prot	c0.09	c0.18		0.03	0.10		0.02	c0.41		c0.10	0.18	
v/s Ratio Perm			0.03			0.02			0.21			0.02
v/c Ratio	0.76	0.80	0.14	0.60	0.63	0.14	0.48	0.93	0.47	0.83	0.34	0.04
Uniform Delay, d1	42.4	36.6	31.1	45.7	38.9	35.9	46.8	25.8	19.1	42.7	13.4	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.3	6.6	0.2	5.5	2.5	0.3	5.6	16.5	0.5	23.7	0.2	0.0
Delay (s)	53.6	43.2	31.3	51.2	41.5	36.1	52.4	42.3	19.6	66.4	13.6	11.3
Level of Service	D	D	C	D	D	D	D	D	B	E	B	B
Approach Delay (s)		42.7			41.3			33.7			29.3	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM Average Control Delay			37.0			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			98.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			68.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: SR 120 EB Ramps & Airport Way

Movement	EB	EB	EB	EB	NB	NB	NB	B55	B55	SB	SB
Directions Served	L	LT	R	R	T	T	R	T	T	T	T
Maximum Queue (ft)	157	160	40	49	160	390	185	3	15	73	93
Average Queue (ft)	104	112	24	33	74	177	73	0	2	34	57
95th Queue (ft)	155	165	49	48	161	399	188	6	16	77	98
Link Distance (ft)		1670	1670		1651	1651		432	432	933	933
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	700			700			175				
Storage Blk Time (%)						3	0				
Queuing Penalty (veh)						15	1				

Intersection: 3: SR 120 WB Ramps & Airport Way

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	R	T	T	R	T	T	T	R
Maximum Queue (ft)	90	103	216	223	326	486	199	53	60	60	69
Average Queue (ft)	40	62	133	145	189	232	54	19	27	17	25
95th Queue (ft)	86	106	223	237	341	495	198	56	70	56	68
Link Distance (ft)		1575	1575		933	933		529	529	529	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	500			500			175				200
Storage Blk Time (%)						5	0				
Queuing Penalty (veh)						32	1				

Intersection: 4: Daniels St & Airport Way

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	LT	R	R	L	L	T	R	L	L	T	T
Maximum Queue (ft)	50	96	49	55	146	216	81	90	212	302	473	524
Average Queue (ft)	20	52	20	31	84	150	38	38	142	173	291	353
95th Queue (ft)	53	101	50	58	147	224	88	89	219	307	513	580
Link Distance (ft)		1306	1306				1479				529	529
Upstream Blk Time (%)											1	3
Queuing Penalty (veh)											10	23
Storage Bay Dist (ft)	225			325	350	350		350	350	350		
Storage Blk Time (%)											3	25
Queuing Penalty (veh)											15	118

Intersection: 4: Daniels St & Airport Way

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	150	178	83	108	270	123
Average Queue (ft)	120	112	42	66	160	51
95th Queue (ft)	196	197	87	114	323	127
Link Distance (ft)			1962	1962	1962	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	125	175			250	
Storage Blk Time (%)	1	4			1	0
Queuing Penalty (veh)	5	6			1	0

Network Summary

Network wide Queuing Penalty: 226

Intersection: 2: SR 120 EB Ramps & Airport Way

Movement	EB	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	R	T	T	R	T	T
Maximum Queue (ft)	144	141	128	144	99	130	55	218	248
Average Queue (ft)	85	91	84	92	58	68	18	147	174
95th Queue (ft)	151	144	134	147	112	126	62	234	260
Link Distance (ft)		1670	1670		1651	1651		933	933
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	700			700			175		
Storage Blk Time (%)						0	0		
Queuing Penalty (veh)						0	0		

Intersection: 3: SR 120 WB Ramps & Airport Way

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	R	T	T	R	T	T	T	R
Maximum Queue (ft)	119	142	126	105	196	229	60	198	212	210	158
Average Queue (ft)	73	94	73	69	116	130	11	92	118	122	52
95th Queue (ft)	123	148	127	114	205	230	88	181	204	216	157
Link Distance (ft)		1575	1575		933	933		529	529	529	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	500			500			175				200
Storage Blk Time (%)						2	0			1	0
Queuing Penalty (veh)						3	0			2	0

Intersection: 4: Daniels St & Airport Way

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	LT	R	R	L	L	T	R	L	L	T	T
Maximum Queue (ft)	249	607	143	169	255	301	186	165	318	347	476	477
Average Queue (ft)	211	361	90	96	188	220	117	91	216	239	297	329
95th Queue (ft)	283	606	154	174	270	307	198	179	334	371	511	531
Link Distance (ft)		1306	1306				1479				529	529
Upstream Blk Time (%)											1	1
Queuing Penalty (veh)											6	9
Storage Bay Dist (ft)	225			325	350	350		350	350	350		
Storage Blk Time (%)	6	22				0			0	1	2	31
Queuing Penalty (veh)	18	45				0			1	3	8	113

Intersection: 4: Daniels St & Airport Way

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	150	179	362	497	640	260
Average Queue (ft)	103	121	268	324	426	144
95th Queue (ft)	196	198	387	499	667	309
Link Distance (ft)			1962	1962	1962	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	125	175			250	
Storage Blk Time (%)	1	3	26		29	0
Queuing Penalty (veh)	3	8	25		85	0

Network Summary

Network wide Queuing Penalty: 329

WATER SUPPLY ASSESSMENT

City of Manteca

Water Supply Assessment for Family Entertainment Zone

Prepared for

City of Manteca

January 2015



487-02-14-06

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- Attachment A: Potable and Recycled Water Demand Projections
- Attachment B: City's Detailed Demand Projections

CHAPTER 1

Introduction



The City of Manteca (City) is planning to construct a Family Entertainment Zone (FEZ) on property owned by the City. A programmatic-level Environmental Impact Report (EIR) is being prepared for the entire FEZ Project (Project), along with a project-level EIR for Phase I of the Project. The purpose of this Water Supply Assessment (WSA) is to support both the programmatic-level and the project-level EIR for the Project.

The legal requirement for a WSA and the project background are discussed below.

1.1 LEGAL REQUIREMENT FOR A WATER SUPPLY ASSESSMENT

California Senate Bill 610 (SB 610) was approved by Governor Davis on October 9, 2001, and made effective on January 1, 2002. SB 610 amended California state law to improve the link between information on water supply availability and certain land use decisions made by cities and counties. Specifically, certain sections of the California Water Code were amended to require coordination between land use lead agencies, and public water purveyors. The purpose of this coordination is to ensure that prudent water supply planning has been conducted, and that planned water supplies are adequate to meet existing demands, anticipated demands from approved projects and tentative maps, and the demands of proposed projects.

The amended Water Code sections 10910 through 10915 (inclusive) require land use lead agencies to: (1) identify any public water purveyor that may supply water for a proposed development project; and (2) request from the identified purveyor a WSA. The purpose of a WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the project, while still meeting the water purveyor's existing and planned future uses. Water Code sections 10910 through 10915 delineate the specific information that must be included in a WSA.

The purpose of this WSA is to perform the evaluation required by Water Code sections 10910 through 10915 in connection with the Project. It is not to reserve water, or to function as a "will serve" letter or any other form of commitment to supply water (see Water Code section 10914). The provision of water service will continue to be undertaken in a manner consistent with applicable City policies and procedures and consistent with existing law.

1.2 BACKGROUND

According to the Project Description found in Appendix A of the recirculated Notice of Preparation (De Novo, 2014), the Project site currently has a General Plan Land Use designation "Public/Quasi-Public" (PQP), and a zoning designation of PQP. The land is owned entirely by the City. The vacant land portion of the site is currently used for land application of treated effluent from the City's Water Quality Control Facility (WQCF) (De Novo, 2014). A portion of the Project site has been developed and now includes the Big League Dreams ballpark, including six replica ballparks, an indoor soccer facility, two restaurants and other supporting facilities all of which are open to the public and operated by private sector parties pursuant to ground leases.

The regional location of the Project is shown on Figure 1-1.



Chapter 1

Introduction

The Project site has relatively flat terrain. The Union Pacific Railroad (UPRR) rail lines are located along the northwestern boundary. High voltage power lines, within Pacific Gas & Electric (PG&E) power line easements, traverse portions of the Project site running northeast/southwest.

The Project will encompass multiple projects and parcels that in the aggregate will provide an extensive park and recreation complex featuring 210.7 acres of new and existing recreational, park, water, sports and other leisure amenities. The FEZ planning area will be open and accessible to the general public, and will be designed to serve the state, region, and the City community as a multi-purpose recreation center and public park facility. The FEZ will feature a wide range of active and passive open space and developed uses that will support short-term and longer-term activities and community events for users ranging from local citizens, day and weekend regional visitors, and destination tourists.

A draft Project Description for the Project has been prepared as indicated above. A Recirculated Notice of Preparation of the Project EIR was prepared in November 2014 (De Novo, 2014). As a part of the Project application process and the preparation of the Project EIR, this WSA has been prepared on behalf of the City, who would be the water purveyor for the Project.

1.3 WATER SUPPLY ASSESSMENT PREPARATION, FORMAT AND ORGANIZATION

This WSA for the Project has been prepared by West Yost Associates, as requested by De Novo Planning Group (De Novo), which is preparing the EIR for the Project.

The format of this WSA is intended to follow Water Code sections 10910 through 10915 to clearly delineate compliance with the specific requirements for a WSA. The WSA includes the following sections:

- Chapter 1: Introduction
- Chapter 2: Description of Project
- Chapter 3: Required Determinations
- Chapter 4: City of Manteca Water Service Area
- Chapter 5: City of Manteca Water Demands
- Chapter 6: City of Manteca Water Supplies
- Chapter 7: Determination of Water Supply Sufficiency
- Chapter 8: Water Supply Assessment Approval Process
- Chapter 9: References

Relevant citations of Water Code sections 10910 through 10915 are included throughout this WSA in *italics* to demonstrate compliance with the specific requirements of SB 610.



Chapter 1

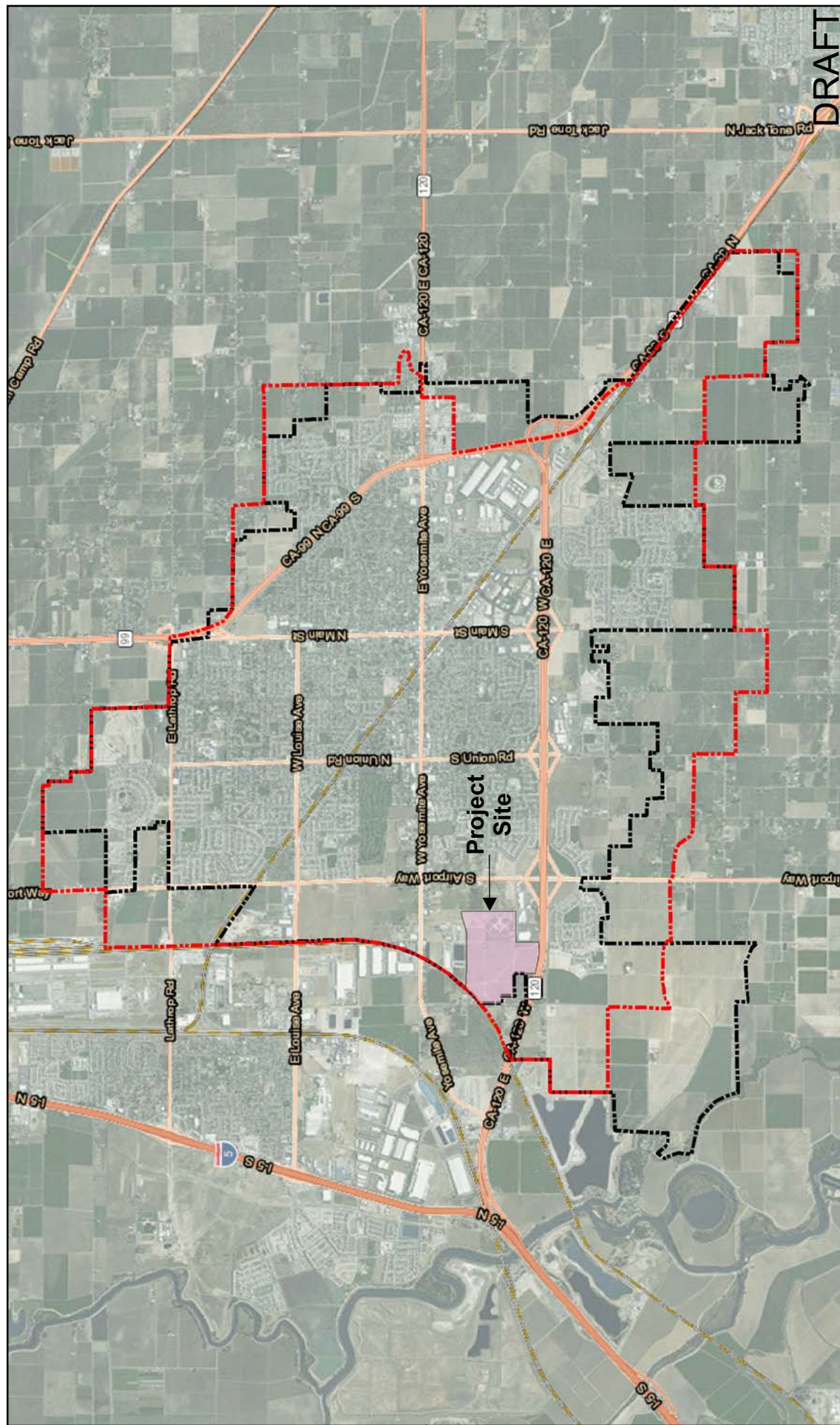
Introduction

1.4 ACRONYMS AND ABBREVIATIONS USED IN THIS WATER SUPPLY ASSESSMENT

The following acronyms and abbreviations have been used throughout this WSA.

AFY	Acre-Feet Per Year
CEQA	California Environmental Quality Act
City	City of Manteca
De Novo	De Novo Planning Group
DMM	Demand Management Measures
DWR	California Department of Water Resources
EIR	Environmental Impact Report
ESJGB-GMP	Eastern San Joaquin Groundwater Basin Groundwater Management Plan
FAR	Floor Area Ratio
gpcd	Gallons Per Capita Per Day
GMP	Groundwater Management Plan
MCL	Maximum Containment Level
mgd	Million Gallons Per Day
mg/L	Milligrams Per Liter
OID	Oakdale Irrigation District
Project or FEZ	Family Entertainment Zone
SB 610	California State Senate Bill 610 of 2001
SCWSP	South County Water Supply Program
SR	State Route
SSJID	South San Joaquin Irrigation District
TDS	Total Dissolved Solids
UPRR	Union Pacific Railroad
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment
WTP	Water Treatment Plant
WQCF	Water Quality Control Facility

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CHAPTER 2

Description of Project

A description of the Project, including Project Location and Proposed Land Usages and Acreages, is provided below.

2.1 PROJECT LOCATION

The Project site is located in San Joaquin County, north of SR 120, south and east of the UPRR and east of the San Joaquin River. The Project area, located on the east side of the City, is within the City's Sphere of Influence and General Plan area. The land use is currently designated as PQP in both the General Plan land use map and the zoning map.

The Project area is surrounded by a variety of existing land uses as follows:

- **North:** The boundary on the north of the Project site is primarily occupied by the City's WQCF. The property to the north is zoned PQP.
- **East:** The parcels to the east of the Big League Dreams portion of the Project site, across Milo Candini Drive, are zoned M1 Light Industrial and PQP.
- **South:** The Project site is bordered on the south by SR 120. There is some additional vacant land lying to the south of the westernmost portion of the site. The Project site that lies to the south of Big League Dreams is occupied by the Stadium Shopping Center, and is zoned CG (General Commercial).
- **West:** To the west, the Project site is bounded by McKinley Avenue and the Union Pacific Railway right-of-way. The parcels located to the west of those rights-of-way are outside of the City boundary.

The Project location is presented on Figure 1-1.

2.2 PROPOSED LAND USES AND ACREAGES

The Conceptual Plan (Figure 2-1) illustrates the proposed land uses within the Project area.

The proposed Land Uses are listed in Table 2-1.

Chapter 2

Description of Project



Table 2-1. Proposed Family Entertainment Zone Land Use Data

FEZ Planning Area No. ^(a)	Proposed Land Use Per November 14, 2014 Project Description	Land Area, acres	Building Area, ft ²
1	Outdoor Sports Fields	11.8	13,068
1a	New Baseball/Softball Field	3	1,742
1b	New Baseball/Softball Field	2.9	-
2	Outdoor Sports Fields	4.1	-
2a	Outdoor Sports Fields	3.3	-
3	Retail, Food & Beverage	4.6	59,711
4	Main Street Retail	2.2	32,884
5	Retail, Dining and Entertainment	27.2	267,405
6	Future FEZ Expansion	12.7	20,745
7	Adventure Zone	7	11,435
8	Indoors Sports	3.5	77,537
9	Family Entertainment	7	17,424
10	Family Entertainment	5.3	18,295
11	Stadium	10.9	18,731
12	Speed Zone/Outdoor Sports	9	17,424
13	Parking	3.1	-
14	Parking	4.2	-
15	Parking	3.2	-
16	Hotel, Conference Center & Indoor Water Park	28.9	490,000
	Existing Big League Dreams Site	28.5	-
	Roads/ROWs ^(a)	28.3	-
	Total	210.7	1,046,401

(a) Refer to Figure 2-1 for location of Planning Areas.

(b) Rights-of-way

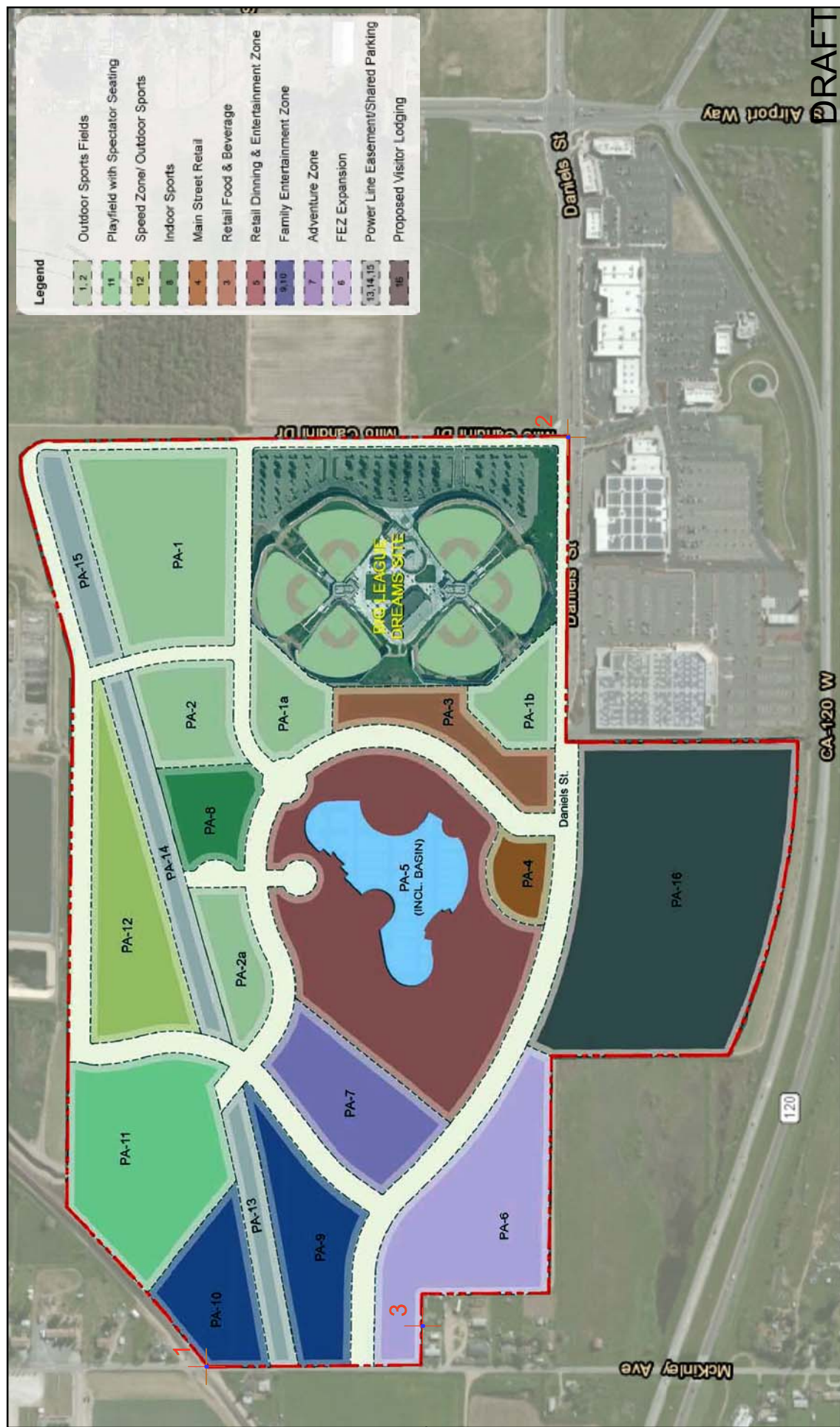


FIGURE 2-1

City of Manteca
Family Entertainment Zone
Water Supply Assessment

Source: Original figure by DeNovo Planning Group, 2014

CONCEPTUAL PLAN



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CHAPTER 3

Required Determinations

This Chapter describes the required determinations for a WSA.

3.1 DOES SB 610 APPLY TO THE PROJECT?

10910(a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

10912(a) "Project" means any of the following:

- (1) A proposed residential development of more than 500 dwelling units.*
- (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.*
- (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.*
- (4) A proposed hotel or motel, or both, having more than 500 rooms.*
- (5) 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 having more than 650,000 square feet of floor area.*
- (6) A mixed-use project that includes one or more of the projects specified in this subdivision.*
- (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.*

Based on the following facts, SB 610 does apply to the Project.

- The City has determined that the Project is subject to the California Environmental Quality Act (CEQA) and that an EIR is required.
- According to the City's 2005 Urban Water Management Plan (UWMP), a typical single family residence used approximately 0.66 acre-feet per year (AFY), based on year 2000 data. Because water demands are expected to decrease somewhat, for purposes of this analysis, a water demand factor of 0.5 acre-feet per residential dwelling unit per year is assumed. Therefore, a development in the City with a demand of 250 AFY, or greater, would satisfy the requirements of criterion 7. Because the maximum potable water demand is projected to be 384 AFY (see Chapter 5), which is greater than the amount of water required by a 500-dwelling unit project in the City, criterion 7 does apply.
- Planning Area 16 of the Project (see Table 2-1) includes a 500 room hotel (criterion 4) and therefore meets the definition of a "Project" as specified in Water Code section 10912(a) paragraph (4) as defined for proposed hotel developments.

Therefore, according to Water Code section 10910(a), a WSA is required for the Project.



Chapter 3

Required Determinations

3.2 WHO IS THE IDENTIFIED PUBLIC WATER SYSTEM?

10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project

10912(c) “Public water system” means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections...

As shown on Figure 1-1, the Project is currently located inside the existing City limits and within the City’s Primary Urban Service Area (PUSA).

The City’s water system service area includes all areas within the PUSA. Therefore, the City is the identified public water system for the Project.

3.3 DOES THE CITY HAVE AN ADOPTED UWMP AND DOES THE UWMP INCLUDE THE PROJECTED WATER DEMAND FOR THE PROJECT?

10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

The City’s most recently adopted UWMP (the City’s 2005 UWMP) was adopted by the City Council on December 19, 2005¹. The City’s 2005 UWMP included existing and projected water demands for existing and projected future land uses to be developed within the City’s General Plan Sphere of Influence through 2030. Although the Project’s potable water demand was not specifically designated in the City’s 2005 UWMP, the water demand projections in the City’s 2005 UWMP included existing City water demands, future water demands for developments within the existing City limit, and future water demands for future service areas outside the existing City limit.

Total water use throughout the City service area was projected in the City’s 2005 UWMP to increase from 18,310 AFY in 2010 to 35,735 AFY in 2030, an increase of 17,425 AFY. In 2010, the City’s actual total water use was 13,064 AFY, which was 5,246 AFY less than the volume projected in the 2005 UWMP. City staff has also updated the projected potable water demand for 2035 to be 31,499 acre-feet. The water demand projection included in the City’s 2005 UWMP did not include the impacts of the City’s water conservation plan, nor did it include compliance with the Water Conservation Act of 2009, known as SBx7-7, since that law was promulgated after adoption of the City’s 2005 UWMP.

¹ Prepared by City of Manteca, *City of Manteca 2005 Urban Water Management Plan*. December 2005.



Chapter 3

Required Determinations

The City's 2005 UWMP showed a slight water supply deficit by the year 2030. However, as noted above, the City has recently revised its demand and supply projections based on current water use and projected new development. The revised projections indicate that sufficient water supply exists, or will exist, to serve the Project. This is described further in Chapters 5 and 6 of this WSA.

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CHAPTER 4

City of Manteca Water Service Area

This Chapter presents the City's Water Service Area including history and growth information for the City.

4.1 WATER SERVICE AREA

As described in the City's 2005 UWMP, the City is located in the flat plain at the northern end of California's San Joaquin Valley in south San Joaquin County. The City is located approximately 10 miles south of Stockton and 15 miles north of Modesto. Rich agricultural lands abut Manteca on the north, east, and south, while areas to the west are used primarily for industry. The Southern Pacific Railroad cuts the City diagonally from southeast to northwest. State Highway 120 crosses the southern portion of the City and provides a connection between Interstate 5, located about four miles to the west of the City, and Highway 99 along the eastern boundary of the City. This location creates a good setting for Bay area commuter housing as well as new commercial and industrial locations.

Presently, the City limits encompass an area of about 17 square miles (10,890 acres). Approximately 67 percent (7,281 acres) of the area within the City limits have been developed. The City provides water service to about 16,000 residential and 700 institutional, commercial and industrial customers. The City, along with much of the San Joaquin Valley, anticipates substantial future growth given the City's proximity to the San Francisco Bay area. Current water planning is for the City of Manteca 2003 General Plan PUSA shown in Figure 1-1. The gross area within the PUSA is 13,790 acres.

The water supply for the City consists of treated surface water delivered through the South County Water Supply Program (SCWSP) and groundwater extracted within the City. The water utility system is a self-supporting City enterprise. The water utility is responsible for operation, maintenance, and repair of the City's water distribution system, as well as water quality monitoring, meter installation, and meter reading. For reference, background information is presented below for the City service area, including projected population and climate.

4.1.1 Current/Projected City Population

The population projection for the City from 2010 to 2035 is shown in Table 4-1.

Table 4-1. City of Manteca Existing and Projected Population						
Year	2010 ^(a)	2015 ^(a)	2020 ^(b)	2025 ^(b)	2030 ^(b)	2035 ^(b)
Service Area Population	67,096	77,284	87,471	97,410	107,766	117,010
^(a) Census 2010 for 2010, interpolated between 2010 and 2020 for 2015.						
^(b) Updated projections from San Joaquin Council of Governments (2014).						



Chapter 4

City of Manteca Water Service Area

4.1.2 Climate

Climate and precipitation information are described in the City's 2005 UWMP. The City experiences hot summer temperatures with many days over 100°F during July and August. Nighttime temperatures during July and August drop only into the seventies. The winter temperatures are much colder, with daytime highs in the forties and fifties. Winter lows are in the thirties and forties. Overnight freezes are infrequent. Spring and fall provide moderate temperature ranges. The mean annual precipitation is 14 inches.

Monthly climate data is provided in Table 4-2. The evapotranspiration (ET_o) data in Table 4-2 data was obtained from the California Irrigation Management Information Service (CIMIS) for Station 70-Manteca in the San Joaquin Region. Rainfall and temperature data was obtained from National Oceanic and Atmospheric Administration (NOAA) website.

As indicated by the ET_o and rainfall data there is a significant difference between evapotranspiration and rainfall through much of the year, which results in a significant water demand for landscape irrigation during summer months.

Table 4-2. City of Manteca Average Monthly Climate Data^(a)

Month	Average Evapotranspiration, inches	Rainfall, inches	Average Temperature, F°
January	0.90	2.85	45.5
February	1.73	2.27	50.5
March	3.38	2.06	54.3
April	5.04	1.12	59.5
May	6.45	0.41	66.3
June	7.54	0.08	72.7
July	8.02	0.03	77.3
August	7.11	0.04	76.2
September	5.19	0.27	72.7
October	3.33	0.73	64.3
November	1.60	1.81	53.2
December	0.86	2.33	45.6
Total/Average	51.15	14.0	61.5

^(a) From City's 2005 UWMP, Table 2. Original Data Sources: California Department of Water Resources, California Irrigation Management Information System, Station 70, November 1987 – present. Rainfall and temperature data was obtained by City staff from NOAA website.

CHAPTER 5

City of Manteca Water Demands



10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

5.1 PROJECTED WATER DEMAND

The projected water demand for the Project and the City are discussed below.

5.1.1 Projected Water Demand for the Project

The projected water demand for the Project is shown in Table 5-1. As indicated in Table 5-1, the total projected annual potable water demand for the Project is projected to be 428 AFY, assuming an 80 percent occupancy rate at the proposed hotel (Table 2-1, Planning Area 16). This value includes a 10.3 percent factor for unaccounted for water to match the value in the 2005 UWMP. The Project intends to use low water use fixtures, re-circulate water through the water park, and incorporate other water efficient features. The Project also intends to use recycled water for outdoor irrigation. Proposed athletic fields will either use artificial turf, or be irrigated with recycled water. Detailed potable and recycled water demand projections are included in Attachment A.

Table 5-1. Projected Water Demand for the Family Entertainment Zone ^(a)		
Component	Projected Annual Potable Water Demand, AFY ^(b)	Projected Annual Recycled Water Demand, AFY ^(b)
Family Entertainment Zone ^(c)	384	244
Unaccounted-for Water ^(d)	44	28
Total Water Demand	428	272
^(a) See Attachment A for detailed water demand projections.		
^(b) AFY = Acre-Feet per Year		
^(c) Does not include existing Big League Dreams Ball Park Demands.		
^(d) Based on 10.3 percent of total water production (see City of Manteca 2005 UWMP Table 7).		

5.1.2 City Projected Water Demand

The City's 2005 UWMP describes the projected City water demand through 2030. The City has recently developed revised potable water demand projections, shown in Table 5-2. The City's detailed projections are included in Attachment B.



Chapter 5

City of Manteca Water Demands

Table 5-2. City of Manteca Total Water Demand Projection^(a)

Year	Projected Normal Year Demand, AFY	Projected Single Dry Year Demand, AFY ^(b)	Projected Multi-Dry Year Demand, AFY ^(c)
2015	20,950	18,113	20,575
2020	23,169	20,104	22,785
2025	25,728	22,401	25,334
2030	28,602	24,982	28,198
2035	31,499	27,583	29,636

^(a) Received from City staff, January 13, 2015. Total Water Demand Projection includes non-potable (raw water) City Park irrigation, and private well demand within the PUSA. Refer to Attachment B.

^(b) Assumes Stage 2 Water Conservation (25% reduction in irrigation demand and 10% reduction in potable demand).

^(c) Assumes Stage 1 Water Conservation (25% reduction in irrigation demand).

The projected water demands shown in Table 5-2 will be used throughout this WSA.

Several steps, including demand reduction, are being taken to help ensure an adequate water supply for the City. The City's 2005 UWMP provides a discussion of how the City is evaluating and implementing the 14 Demand Management Measures (DMM) required by the Urban Water Management Planning Act. These DMMs include programs such as water surveys for single-family and multi-family residences, residential plumbing retrofits, and school education. In addition, the City's proposed water conservation ordinance (included in its 2005 UWMP) describes four stages of action to be undertaken to achieve a water use reduction of up to 50 percent.

CHAPTER 6

City of Manteca Water Supplies



10910(d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts.

10910(d)(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

- (A) Written contracts or other proof of entitlement to an identified water supply.*
- (B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.*
- (C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.*
- (D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.*

10910(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contract-holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.

The Project, if approved by the City, is capable of being served by the City from the City's existing and future portfolio of water supplies. The water supply for the Project will have the same water supply reliability and water quality as the water supply available to each of the City's other existing and future water customers.

Though not specifically mentioned, the water demands for the Project (together with existing water demands and planned future uses) are included in the City's 2005 UWMP. Therefore, the descriptions provided below for the City's water supplies have been taken, for the most part, from the City's 2005 UWMP, which was adopted in December 2006, and the SSJID 2010 UWMP, which was adopted in September 2011.



6.1 EXISTING POTABLE WATER SUPPLIES

10910(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment.

10910(f)(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

10910(f)(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

10910(f)(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

10910(f)(4) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project.

A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.



Chapter 6

City of Manteca Water Supplies

The City's 2005 UWMP describes the City's available water supplies. The City's water supplies include local groundwater and treated surface water from the SSJID South County Water Supply Project (SCWSP). Historical and recent supplies of groundwater and surface water are summarized in Table 6-1.

**Table 6-1. Historical and Recent Potable Water Supply (1960-2013)
for the City of Manteca^(a)**

Year	Groundwater Pumping, AFY	Treated Surface Water Deliveries, AFY	Total, AFY
1960	2,277	—	2,277
1970	3,115	—	3,115
1980	5,785	—	5,785
1990	9,873	—	9,873
2000	12,608	—	12,608
2001	12,969	—	12,969
2002	13,509	—	13,509
2003	14,298	—	14,298
2004	14,933	—	14,933
2005	11,276	2,749	14,025
2010	7,343	5,721	13,064
2011	7,893	5,843	13,736
2012	8,945	5,894	14,839
2013	8,351	7,399	15,750

^(a) Water production data prior to 2003 are from Trails of Manteca WSA. Water production data from 2003 and later are from the Water Conservation and Drought Planning staff presentation to City Council, February 4, 2014.

6.2 SURFACE WATER

The principal component of future water supply for the City is deliveries from the SCWSP. The SCWSP is a joint effort of SSJID and the cities of Escalon, Manteca, Lathrop, and Tracy to supply treated potable water to the participating cities. The City has entered into a Water Supply Development Agreement with SSJID for its share of the SCWSP. SCWSP water allotments are presented in Table 6-2. The Phase I and Phase II SCWSP water allotments for the City are 11,500 AFY and 18,500 AFY, respectively.

Per City direction, Phase I of the SCWSP is assumed for this WSA through 2020 and Phase II is assumed for 2025 and later.



**Table 6-2. South County Water Supply Program
Water Allotments for Participating Cities**

Participating Cities	Annual Water Allotment, AFY	
	Phase I	Phase II
Escalon	2,015	2,799
Lathrop	6,787	10,671
Manteca	11,500	18,500
Tracy	11,120	11,120
Total	31,522	43,090

The SCWSP includes a water treatment plant (WTP) located near Woodward Reservoir and 36.5 miles of pipeline ranging in diameter from 20-inches to 54-inches to transport treated water to various turnouts for each of the four cities. The WTP has an initial capacity of 36 million gallons per day (mgd) and a planned ultimate capacity of 60 mgd.

6.3 GROUNDWATER

The local groundwater basin and City groundwater use are described in the City's 2005 UWMP. A brief description of the groundwater basin and a discussion of historical and projected groundwater pumping are provided below.

6.3.1 Basin Boundaries, Soils, and Storage Capacity

The City's wells are located in the Eastern San Joaquin County Groundwater Basin. The basin is not adjudicated; however, a basin management plan has been created. The Eastern San Joaquin Groundwater Basin Groundwater Management Plan (ESJGB-GMP) (NSJGB, 2004) was prepared in September 2004. The purpose of the ESJGB-GMP is "to review, enhance, assess, and coordinate existing groundwater management policies and programs in Eastern San Joaquin County and to develop new policies and programs to ensure the long-term sustainability of groundwater resources in Eastern San Joaquin County." According to Department of Water Resources (DWR) Bulletin 118 (DWR, 2006), the ESJGB is in a critical condition of overdraft. Groundwater levels have declined in the basin since the 1960s with the lowest groundwater levels found in eastern San Joaquin County.

Most of the fresh groundwater is encountered at depths of less than 1,000 feet, and most of this shallow groundwater is unconfined. A discussion of basin hydrogeology is provided in the ESJGB-GMP. The Victor formation is the uppermost formation and extends from the ground surface to a maximum depth of about 150 feet. Compared to the underlying formations, the Victor formation is generally more permeable and the groundwater is typically unconfined.



Chapter 6

City of Manteca Water Supplies

The underlying Laguna formation includes discontinuous lenses of unconsolidated to semi-consolidated sands and silts interspersed with lesser amounts of clay and gravel. The Laguna formation is hydraulically connected to the Victor formation and is estimated to be 750 to 1,000 feet thick. Moderate permeability has been reported within the Laguna formation with some highly permeable coarse-grained beds. Most of the municipal and industrial wells in the Manteca area penetrate through the Victor formation into the Laguna formation.

6.3.2 Past and Projected Future Groundwater Pumping

Groundwater pumping in Manteca increased from 2,277 AFY in 1960 to a maximum of 14,933 AFY in 2004 (see Table 6-1), prior to the SCWSP delivering treated surface water to the City.

According to the City's 2005 UWMP, the sustainable yield of the groundwater basin was estimated in a 1985 study² to be approximately 1 acre-foot per acre per year. Although groundwater pumping in some years has exceeded that rate, as part of the SCWSP, the City intends to limit groundwater pumping within the PUSA to that rate or less. At this time, the area of the City's PUSA is 13,790 acres. Therefore, the City intends to limit groundwater pumping to a long-term average of no greater than 13,790 AFY.

6.4 DRY YEAR WATER SUPPLY AVAILABILITY AND RELIABILITY

Water Code section 10910 (c)(4) requires that a WSA include a discussion with regard to *"whether total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses."* Accordingly, this WSA addresses these three hydrologic conditions through the year 2035.

A description of the City's surface water and groundwater supply reliability is presented in the City's 2005 UWMP and is summarized below.

6.4.1 Surface Water Reliability

SSJID has existing agreements to provide surface water to agricultural interests, federal and state agencies, and cities in the south San Joaquin area. Some of these agreements are long-term, while others are as short as one week for agricultural water deliveries.

² This study is possibly the study that is referenced in Bulletin 118 (1/20/2006 version), "Eastern San Joaquin County Groundwater Study. Final Report." San Joaquin County Flood Control and Water Conservation District, prepared by Brown & Caldwell Consulting Engineers, 1985.



Chapter 6

City of Manteca Water Supplies

6.4.1.1 SSJID Surface Water Entitlements

Both the SSJID and the Oakdale Irrigation District (OID) were formed in 1909 following the acquisition of the old Tulloch Ditch Company water rights. SSJID receives a major portion of its water supply from the Stanislaus River, pursuant to a number of pre-1914 water rights, beginning with 1853 diversion rights. Based on these pre-1914 water rights, SSJID and OID are entitled to a combined 1,816.6 cubic feet per second (cfs) of direct surface water diversions from the Stanislaus River annually.

These pre-1914 water rights are equally shared with OID and are adjudicated (SSJID, 1999). A 1988 agreement between SSJID, OID, and the United States Bureau of Reclamation (USBR) recognized and protected the OID and SSJID senior water rights that would be affected by the New Melones Reservoir. The agreement entitles SSJID and OID to 600,000 AFY in years when inflow to New Melones Reservoir is equal to or exceeds 600,000 AFY. In years when inflow to New Melones Reservoir is less than 600,000 AFY, the entitlement is reduced based on a predetermined formula. During periods of normal flow, SSJID's entitlement is 300,000 AFY.

6.4.1.2 Reliability of SCWSP Deliveries

A summary of projected SCWSP surface water supply availability is presented in Table 6-3.

Table 6-3. Projected Annual SCWSP Surface Water Supply Availability for Normal Hydrologic Year^(a)	
Year	SCWSP Deliveries, AFY
2015	11,500
2020	11,500
2025	18,500
2030	18,500
2035	18,500
^(a) Assumes SCWSP Phase II would be constructed prior to 2025. Refer to Attachment B.	

According to Table 6.3 of the 2010 SSJID UWMP, possible reductions in surface water supply for the City from the SCWSP could be required in Single Dry and Multiple Dry Years. The projected surface water deliveries to the City are presented in Table 6-4.

Under single-year and multiple-year dry period scenarios, deliveries to the City by SSJID could be reduced. The City could compensate for this reduction in deliveries through increased groundwater pumping, implementation of water conservation measures, and possibly the expanded use of recycled water.



Table 6-4. SCWSP Surface Water Deliveries to the City of Manteca During Hydrologic Normal, Single-Dry, and Multiple-Dry Years^(a)

Delivery Type	SCWSP Deliveries to Manteca by Year, AFY				
	2015	2020	2025	2030	2035
Normal year	11,500	11,500	18,500	18,500	18,500
Single-year dry period ^(b)	7,245	7,245	11,655	11,655	11,655
Multiple-year dry period ^(c)	9,890	9,890	15,910	15,910	15,910

(a) Based on values provided by City, refer to Attachment B for more detail.
(b) Per City staff, the SSJID 2012 Agricultural Water Management Plan states the minimum supply for any year would be 63% of total supply. Sixty three percent of 11,500 AFY is 7,245 AFY, and 63% of 18,500 AFY is 11,655 AFY.
(c) SSJID 2010 UWMP Table 6.5 indicates 85.6 percent delivery in 2015, 84.8 percent in 2020, 87.7 percent in 2025, and 91.5 percent in 2030. Assumed 91.5 percent in 2035. Per City staff, the values shown are 86% of the Normal Year supply.

It is important to note that in this current drought, SSJID is delivering 100 percent of the City's requested surface water allocation.

6.4.2 Groundwater Reliability

Projected total available water supplies during hydrologic normal years, single-year dry periods, and multiple-year dry periods are summarized in Table 6-5.

As presented in Table 6-5, the surface water supply may decrease under single-year and multiple-year dry period conditions. This shortfall would be made up through increased groundwater pumping and city-wide conservation measures. Groundwater extractions will be maintained within the safe yield of the groundwater basin. As documented in the City's 2005 UWMP, the maximum groundwater pumping is based on the estimated safe aquifer yield of 1 AFY/acre, and a Primary Urban Service Area (PUSA) area of 13,790 acres. Therefore, the City is targeting a groundwater pumping regime that will not exceed 13,790 AFY on a long-term average.

Table 6-5. Summary of Projected Water Supply During Hydrologic Normal, Single-Dry, and Multiple-Dry Years for City of Manteca, AFY^(a)

Year	Available Water Supply									
	Normal Year, ac-ft/yr			Single-Dry Year Drought, ac-ft/yr			Multiple-Dry Year Drought, ac-ft/yr			Total
	Groundwater Pumping	Surface Water Deliveries	Total	Groundwater Pumping	Surface Water Deliveries	Total	Groundwater Pumping	Surface Water Deliveries		
2015	12,000	11,500	23,500	13,790	7,245	21,035	12,000	9,890	21,890	
2020	13,790	11,500	25,290	13,500	7,245	20,745	13,790	9,890	23,680	
2025	13,790	18,500	32,290	13,790	11,655	25,445	13,790	15,910	29,700	
2030	13,790	18,500	32,290	13,790	11,655	25,445	13,790	15,910	29,700	
2035	13,790	18,500	32,290	16,000	11,655	27,655	13,790	15,910	29,700	

(a) Refer to City water supply projections in Attachment B.



CHAPTER 7

Determination of Water Supply Sufficiency

10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

10911 (a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water supply assessment its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:

- (1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.*
- (2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.*
- (3) Based on the consideration set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to be able to acquire additional water supplies.*

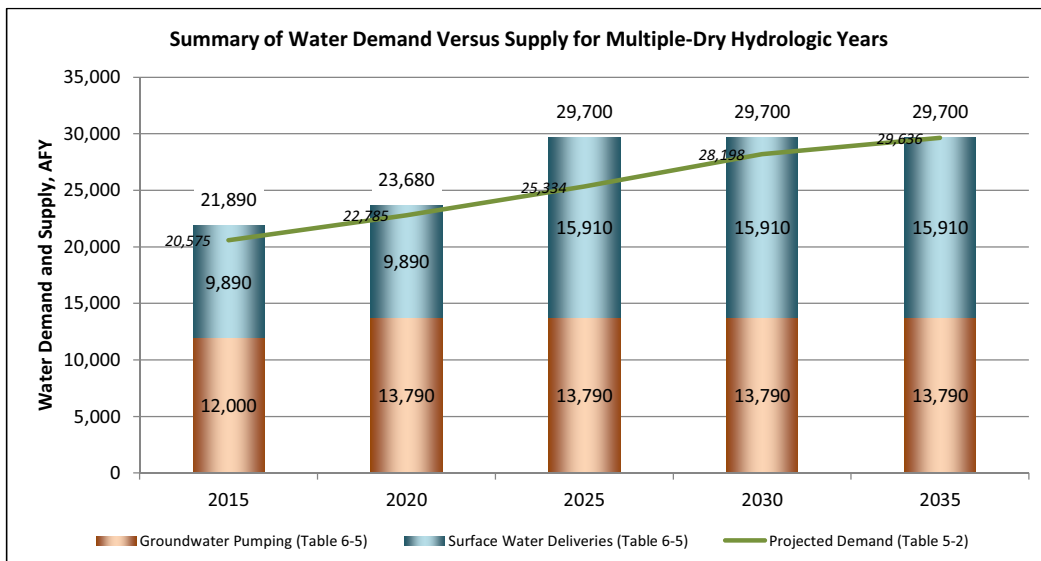
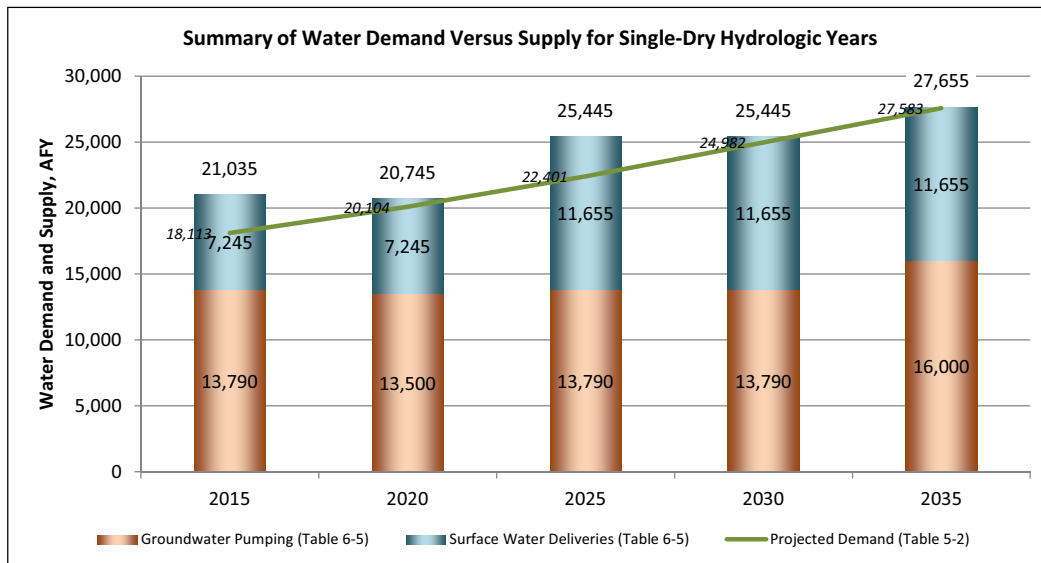
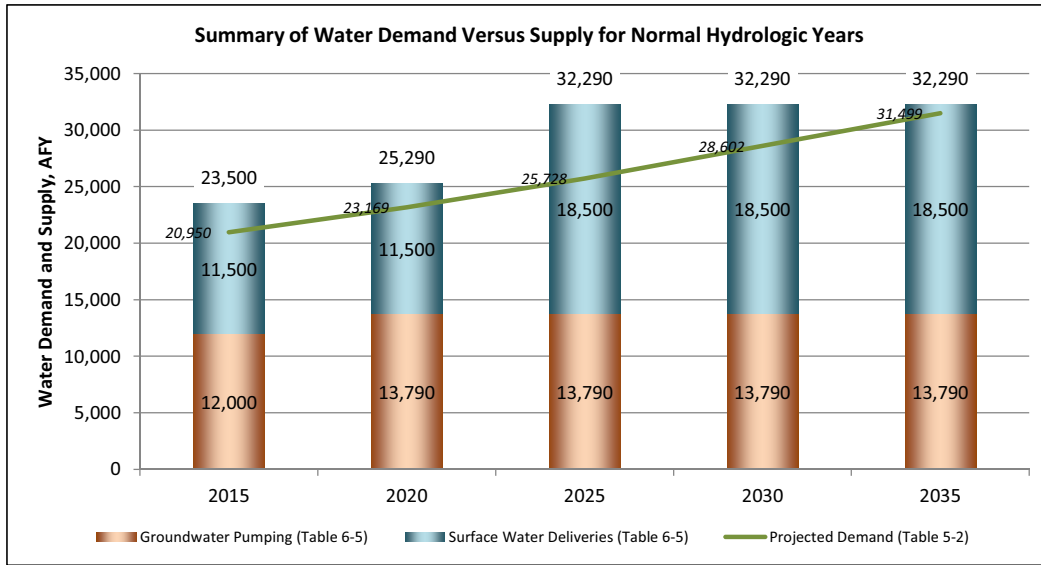
7.1 FINDINGS

Based on the analysis described above, this WSA demonstrates that the City's existing and projected potable water supplies are sufficient to meet the City's existing and projected future potable water demands, including those future water demands associated with the Project, to the year 2035 under all hydrologic conditions as described below.

A comparison of the City's projected water supplies and demands is shown in Figure 7-1 for Normal, Single Dry, and Multiple Dry Years. As can be seen on Figure 7-1, there is no projected supply deficit under the projected hydrologic conditions.

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Figure 7-1. Summary of Water Demand Versus Supply During Hydrologic Normal, Single-Dry, and Multiple-Dry Years for City of Manteca



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CHAPTER 8

Water Supply Assessment Approval Process

10910(g)(1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.

10911(b) The city or county shall include the water supply assessment provided pursuant to Section 10910, and any information provided pursuant to subdivision (a), in any environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code.

The Manteca City Council must approve this WSA at a regular or special meeting. Furthermore, the City must include this WSA in the Draft EIR being prepared for the Project.

SB 221 applies to residential subdivisions of over 500 dwelling units and requires that the water supplier (the City) provide a written verification that the water supply for the project is sufficient. Because the Project does not include residential land use, it is not subject to the requirements of SB 221 (Government Code section 66473.7).

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CHAPTER 9

References



California Department of Water Resources (DWR), Bulletin 118, *California's Groundwater*, 2006 Update.

City of Manteca 2005 Urban Water Management Plan, December 2005.

De Novo Planning Group 2014. *Recirculated Notice of Preparation of an Environmental Impact Report and Scoping Meeting for Manteca Family Entertainment Zone*, Manteca, CA.

Provost & Pritchard, 2011. *South San Joaquin Irrigation District 2010 Urban Water Management Plan*.

Northeastern San Joaquin County Groundwater Banking Authority (NSJCGB), *Eastern San Joaquin Groundwater Basin Groundwater Management Plan*, September 2004.

South San Joaquin Irrigation District (SSJID), *South County Surface Water Supply Project EIR*, Prepared by Environmental Science Associates, July 1999.

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ATTACHMENT A

Potable and Recycled Water Demand Projections

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Table A-1. Projected Potable and Recycled Water Demands for Family Entertainment Zone in the City of Manteca

FEZ Planning Area No.	Proposed Land Use Per November 14, 2014 Project Description	Land Use Data			Potable Water Demand				Recycled Water Demand				
		Area, acres	Building Area	Units	Interior Water Use Factor	units	Water Demand, mgd	Water Demand, af/year	Gross Acres Irrigable, %	Percent of Area with Recycled Water, %	Unit Demand, Inches/yr.	Recycled Water Demand, mgd	Recycled Water Irrigation Demand, Af-ft/year
1	Outdoor Sports Fields	11.8	13,068	ft ²	0.1	gpd/ft ²	0.001	1.5	11.8	90.0%	47.4	0.037	41.9
1a	New Baseball/Softball Field	3	1,742	ft ²	0.1	gpd/ft ²	0.000	0.2	3.0	90.0%	47.4	0.010	10.7
1b	New Baseball/Softball Field	2.9		ft ²		gpd/ft ²	0.000	0.0	2.9	100.0%	47.4	0.009	10.3
2	Outdoor Sports Fields	4.1		ft ²		gpd/ft ²	0.000	0.0	4.1	90.0%	47.4	0.013	14.6
2a	Outdoor Sports Fields	3.3		ft ²		gpd/ft ²	0.000	0.0	3.3	100.0%	47.4	0.010	11.7
3	Retail, Food & Beverage	4.6	59,711	ft ²	0.5	gpd/ft ²	0.030	33.4	4.6	5.0%	47.4	0.001	0.9
4	Main Street Retail	2.2	32,884	ft ²	0.1	gpd/ft ²	0.003	3.7	2.2	5.0%	47.4	0.000	0.4
5	Retail, Dining and Entertainment	27.2	267,405	ft ²	0.5	gpd/ft ²	0.134	149.8	27.2	50.0%	47.4	0.048	53.7
6	Future FEZ Expansion	12.7	20,745	ft ²	0.1	gpd/ft ²	0.002	2.3	12.7	15.0%	47.4	0.007	7.5
7	Adventure Zone	7	11,435	ft ²	0.1	gpd/ft ²	0.001	1.3	7.0	15.0%	47.4	0.004	4.1
8	Indoors Sports	3.5	77,537	ft ²	0.2	gpd/ft ²	0.016	17.4	3.5	5.0%	47.4	0.001	0.7
9	Family Entertainment	7	17,424	ft ²	0.1	gpd/ft ²	0.002	2.0	7.0	15.0%	47.4	0.004	4.1
10	Family Entertainment	5.3	18,295	ft ²	0.1	gpd/ft ²	0.002	2.0	5.3	15.0%	47.4	0.003	3.1
11	Stadium	10.9	18,731	ft ²	0.2	gpd/ft ²	0.004	4.2	10.9	50.0%	47.4	0.019	21.5
12	Speed Zone/Outdoor Sports	9	17,424	ft ²	0.1	gpd/ft ²	0.002	2.0	9.0	5.0%	47.4	0.002	1.8
13	Parking	3.1		ft ²		gpd/ft ²	0.000	0.0	3.1	5.0%	47.4	0.001	0.6
14	Parking	4.2		ft ²		gpd/ft ²	0.000	0.0	4.2	5.0%	47.4	0.001	0.8
15	Parking	3.2		ft ²		gpd/ft ²	0.000	0.0	3.2	5.0%	47.4	0.001	0.6
16	Hotel, Conference Center & Indoor Water Park	28.9	500	Rooms	366.8	gpd/room	0.147	164.4	28.9	43.0%	47.4	0.044	49.1
	Existing Big League Dreams Site	28.5							28.5	0.0%	47.4	0.000	0.0
	Roads/ROW	28.3							28.3	5.0%	47.4	0.005	5.6
TOTALS		210.7					0.34	384				0.22	244.0

Planning Area Demand Notes:

General No indoor recycled water use. All outdoor landscape and playing field irrigation will use recycled water, or be constructed with artificial turf. See Table A-2 for irrigation unit demand calculation.

General Overall projected potable and recycled water demand is 3.45 acre-feet per acre, or 3,075 gpd/acre, not including existing Big League Dreams Ball Park.

1, 1a, 1b Minor potable water use for potential restrooms.

2, 2a Turf fields and landscaping irrigated with recycled water.

3, 5 Balance between restaurant water use of 1 gpd/ft² and retail water use of 0.1 gpd/ft².

4 Retail potable water use of 0.1 gpd/ft².

5 Balance between restaurant water use of 1 gpd/ft² and retail water use of 0.1 gpd/ft². Planning Area 5 pond assumed to be filled with recycled water.

6 Potable water for restrooms.

7 Potable water for restrooms.

8 Restrooms and locker rooms.

9, 10 Potable water for restrooms.

11 Restrooms and locker rooms.

12 Minimal landscaping, may include restrooms.

13, 14, 15 No potable water use.

16 Average use factor of 458.6 gpd/occupied room times an estimated maximum annual occupancy of 80 percent. See Table A-3 for Use Factor determination.

Existing BLD No additional water demand.

Roads No potable water demand. Will have median and ROW landscaping.

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Table A-2. Projected Unit Recycled Water Irrigation Demand for City of Manteca Area^(a)

Month	ET ^(b) , in./mo	Rainfall ^(b) , in./mo	Eto in./mo.	ETWU (SLA - All Hydrozones) ^(c)	
				gal./acre	ac-ft./acre
January	0.9	2.9	0.2	5,064	0.02
February	1.7	2.3	1.2	31,396	0.10
March	3.4	2.1	2.9	77,376	0.24
April	5.0	1.1	4.8	128,554	0.39
May	6.5	0.4	6.3	171,428	0.53
June	7.5	0.1	7.5	203,094	0.62
July	8.0	0.0	8.0	216,395	0.66
August	7.1	0.0	7.1	191,751	0.59
September	5.2	0.3	5.1	138,344	0.42
October	3.3	0.7	3.1	85,005	0.26
November	1.6	1.8	1.1	30,991	0.10
December	0.9	2.3	0.3	7,494	0.02
Total	51.2	14.0	47.7	1,286,893	3.9

^(a) Based on the California Code of Regulations, Title 23 Waters, Division 2 DWR, Chapter 2.7 Model Water Efficient Landscape Ordinance.

^(b) Average monthly rainfall and ET based on City's 2005 UWMP Table 2.

^(c) MWELO requires SLA areas to use a hydrozone plant factor of 1.0 and not include irrigation efficiency in the ETWU calculation.

Definitions:

LA = Landscape Areas

SLA = Special Landscape Areas (includes all areas irrigated with recycled water).

ET = Evapotranspiration

ETo = Reference ET

ETo = ET - (0.25 x Rainfall)

ETWU = Estimated Total Water Use

ETWU = ETo x 0.62 x ETcoeff x {[LA x PF)/Irr Eff.]+SLA}

PF = Plant Factor based on Hydrozone Area

Table A-3. Summary of Annual Water Consumption for Great Wolf Lodge Resort Properties							
Property Name	Total Rooms	Estimated Annual Occupancy		Water Volume, gallons	Room-nights	Gallons Per Day Occupied Room	Park size
		Rooms	Percent				
Concord	402	249.1	62.0%	30,769,500	90,975	338.2	11 slides. 4 pools
Grand Mound	398	285.5	71.7%	31,796,127	104,278	304.9	8 slides. 4 pools
Grapevine	602	394.2	65.5%	54,389,000	143,998	377.7	9 slides. 6 pools
Kansas City	281	168.3	59.9%	38,670,545	61,486	628.9	8 slides. 5 pools
Mason	401	243.7	60.8%	40,633,200	89,014	456.5	13 slides. 8 pools
Poconos	401	313.4	78.1%	49,673,810	114,456	434.0	13 slides. 6 pools
Sandusky	271	146.9	54.2%	23,889,787	53,663	445.2	9 slides. 5 pools
Traverse City	280	169.1	60.4%	35,144,930	61,770	569.0	8 slides. 5 pools
Williamsburg	405	271.3	67.0%	55,341,182	99,079	558.6	9 slides. 7 pools
Dells	308	168.7	54.8%	29,115,733	61,606	472.6	13 slides. 9 pools
Average	375	241	63.4%	38,942,381	88,033	458.6	

ATTACHMENT B

City's Detailed Demand Projections

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City Water Supply & Demands - with the Family Entertainment Zone

	2015	2020	2025	2030	2035
Potable Baseline	16,000	16,000	16,000	16,000	16,000
FEZ		428	428	428	428
Existing Entitlements	-	450	950	1,450	1,450
Projects w/ WSA		1,200	3,000	5,000	7,400
Current Applications within PUSA			100	300	620
System Losses (-5%)		104	224	359	495
Sub-total	16,000	18,182	20,702	23,537	26,393
City Parks Irrigation	1,500	1,538	1,576	1,615	1,656
Other -Non City Users ¹	3,450	3,450	3,450	3,450	3,450
Projected "Base" Demand	20,950	23,169	25,728	28,602	31,499
Growth		2,219	2,558	2,874	2,896
Percentage		11%	11%	11%	10%

	Base Demand	Ground	Surface	Total	Difference	%
2015	20,950	12,000	11,500	23,500	2,550	11%
2020	23,169	13,790	11,500	25,290	2,121	8%
2025	25,728	13,790	18,500	32,290	6,562	20%
2030	28,602	13,790	18,500	32,290	3,688	11%
2035	31,499	13,790	18,500	32,290	791	2%

	Base Demand	Water Conservation Stage 2	Total Demand	Ground*	Surface	Total	Difference	%
2015	20,950	(2,838)	18,113	13,790	7,245	21,035	2,923	14%
2020	23,169	(3,065)	20,104	13,500	7,245	20,745	641	3%
2025	25,728	(3,327)	22,401	13,790	11,655	25,445	3,044	12%
2030	28,602	(3,620)	24,982	13,790	11,655	25,445	463	2%
2035	31,499	(3,916)	27,583	16,000	11,655	27,655	72	0%

	Stage 1	Multi-Dry Year Supply						
2015	20,950	(375)	20,575	12,000	9,890	21,890	1,315	6%
2020	23,169	(384)	22,785	13,790	9,890	23,680	895	4%
2025	25,728	(394)	25,334	13,790	15,910	29,700	4,366	15%
2030	28,602	(404)	28,198	13,790	15,910	29,700	1,502	5%
2035 ²	31,499	(1,863)	29,636	13,790	15,910	29,700	64	0%

Stage 1 - Water Conservation = 25% reduction in City Parks Irrigation

Stage 2 - Water Conservation = 25% reduction in Irrigation, 10% reduction in potable due to conservation.

* Year 2035 for Single Dry Year, allow over drafting groundwater by 2,000 AF

¹ Other users include MUSD, SSJID, and other private land owners using wells for water supply.

² In 2035, City will require additional conservation from irrigation users if reclaimed supply incomplete.

Existing Entitlements

Name	New Water Demand (AFY)
Dutra Estates 4	2.06
Terra Bella	28.79
Oleander Estates Unit 1	77.46
Oleander Estates Unit 2	80.89
Tersoro Apts.	37.49
Woodbridge Apts.	31.92
Crivelo Estates	42.50
Deigo Country Estates	16.45
Dutra Estates 5	33.59
Lundblom	12.34
Shadowbrook	340.69
Terra Ranch	145.33
Union Ranch 6 & 8	292.71
Silva Estates	63.75
Winters Colonial	27.42
Woodward Estates	49.36
Monte Bello Estates	74.72
Milner Terrace	52.10
Clearwater Creek	22.62
Tesoro Park	17.14
Total:	1,449.33

Project with WSA

Name	New Water Demand (AFY)
Union Ranch 1-5 & 7	76.09
Evan Estates	401.70
Oleander	214.56
Pillsbury Estates 2	127.50
Sundance	309.16
Villa Tocino West	485.33
Machado Estates	383.88
Woodward Park 1	117.22
Woodward Park 2	126.82
The Trails	1,173.00
Copper Cove/Yosemite Square	740.00
Austin Road	2,956.00
Northwest Airport Way MP	281.00
Total:	7,392.26

Current Application within PUSA

Name	New Water Demand (AFY)
Oakwook Trails at Terra Park	464.77
Amma Apts	46.62
Terra Ranch Apts.	50.67
Villa Tocino West Apts.	41.30
Bright World	14.4
Total:	617.76

Overall Total: 9,459.35

NOISE DATA

Appendix A-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2014-115 FEZ Master Plan
 Description: Existing and Existing Plus Project Traffic
 Ldn/CNEL: Ldn
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Airport Way	North of Yosemite	11,830	83		17	1	1	40	75	0
2	Airport Way	Yosemite to Wawona	13,840	83		17	1	1	40	75	0
3	Airport Way	Wawona to Daniels	13,510	83		17	1	1	40	75	0
4	Airport Way	Daniels to Atherton	19,520	83		17	1	1	40	100	0
5	Airport Way	South of Atherton	6,100	83		17	1	1	55	75	0
6	McKinley Avenue	North of Yosemite	3,840	83		17	1	1	50	200	0
7	McKinley Avenue	South of Yosemite	1,650	83		17	1	1	50	50	0
8	Yosemite Avenue	West of McKinley	4,690	83		17	1	1	45	100	0
9	Yosemite Avenue	McKinley to Airport	8,140	83		17	1	1	40	75	0
10	Yosemite Avenue	East of Airport	13,020	83		17	1	1	45	75	0
11	Wawona Street	East of Airport	1,670	83		17	1	1	40	50	0
12	Daniels Street	East of Airport	5,580	83		17	1	1	55	60	0
13	Atherton Drive	West of Airport	3,630	83		17	1	1	35	75	-5
14	Atherton Drive	East of Airport	1,760	83		17	1	1	35	75	-5
Existing Plus Project											
1	Airport Way	North of Yosemite	12,070	83		17	1	1	40	75	0
2	Airport Way	Yosemite to Wawona	14,570	83		17	1	1	40	75	0
3	Airport Way	Wawona to Daniels	14,070	83		17	1	1	40	75	0
4	Airport Way	Daniels to Atherton	21,720	83		17	1	1	40	100	0
5	Airport Way	South of Atherton	5,730	83		17	1	1	55	75	0
6	McKinley Avenue	North of Yosemite	4,040	83		17	1	1	50	200	0
7	McKinley Avenue	South of Yosemite	1,900	83		17	1	1	50	50	0
8	Yosemite Avenue	West of McKinley	4,740	83		17	1	1	45	100	0
9	Yosemite Avenue	McKinley to Airport	8,240	83		17	1	1	40	75	0
10	Yosemite Avenue	East of Airport	13,410	83		17	1	1	45	75	0
11	Wawona Street	East of Airport	1,710	83		17	1	1	40	50	0
12	Daniels Street	East of Airport	5,780	83		17	1	1	55	60	0
13	Atherton Drive	West of Airport	3,230	83		17	1	1	35	75	-5
14	Atherton Drive	East of Airport	1,760	83		17	1	1	35	75	-5

Appendix A-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2014-115 FEZ Master Plan
 Description: Existing and Existing Plus Project Traffic
 Ldn/CNEL: Ldn
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Airport Way	North of Yosemite	63.0	52.0	53.8	63.8
2	Airport Way	Yosemite to Wawona	63.7	52.7	54.5	64.5
3	Airport Way	Wawona to Daniels	63.6	52.6	54.4	64.4
4	Airport Way	Daniels to Atherton	63.3	52.3	54.1	64.1
5	Airport Way	South of Atherton	64.1	51.3	52.2	64.6
6	McKinley Avenue	North of Yosemite	54.5	42.2	43.4	55.1
7	McKinley Avenue	South of Yosemite	59.9	47.6	48.8	60.4
8	Yosemite Avenue	West of McKinley	58.6	46.9	48.4	59.2
9	Yosemite Avenue	McKinley to Airport	61.4	50.4	52.2	62.2
10	Yosemite Avenue	East of Airport	64.9	53.2	54.7	65.5
11	Wawona Street	East of Airport	57.1	46.1	47.9	57.9
12	Daniels Street	East of Airport	65.2	52.3	53.3	65.7
13	Atherton Drive	West of Airport	51.2	41.0	43.1	52.2
14	Atherton Drive	East of Airport	48.1	37.8	40.0	49.0

Existing Plus Project

1	Airport Way	North of Yosemite	63.1	52.1	53.9	63.9
2	Airport Way	Yosemite to Wawona	63.9	52.9	54.7	64.7
3	Airport Way	Wawona to Daniels	63.8	52.7	54.6	64.5
4	Airport Way	Daniels to Atherton	63.8	52.8	54.6	64.6
5	Airport Way	South of Atherton	63.8	51.0	51.9	64.3
6	McKinley Avenue	North of Yosemite	54.7	42.4	43.6	55.3
7	McKinley Avenue	South of Yosemite	60.5	48.2	49.4	61.0
8	Yosemite Avenue	West of McKinley	58.6	46.9	48.4	59.3
9	Yosemite Avenue	McKinley to Airport	61.4	50.4	52.2	62.2
10	Yosemite Avenue	East of Airport	65.0	53.3	54.8	65.7
11	Wawona Street	East of Airport	57.2	46.2	48.0	58.0
12	Daniels Street	East of Airport	65.3	52.5	53.4	65.8
13	Atherton Drive	West of Airport	50.7	40.4	42.6	51.7
14	Atherton Drive	East of Airport	48.1	37.8	40.0	49.0

Appendix A-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2014-115 FEZ Master Plan
 Description: Existing and Existing Plus Project Traffic
 Ldn/CNEL: Ldn
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----						
			75	70	65	60	55		
1	Airport Way	North of Yosemite	13	29	62	134	289		
2	Airport Way	Yosemite to Wawona	15	32	69	149	321		
3	Airport Way	Wawona to Daniels	15	32	68	147	316		
4	Airport Way	Daniels to Atherton	19	40	87	187	404		
5	Airport Way	South of Atherton	15	33	70	152	327		
6	McKinley Avenue	North of Yosemite	9	20	44	94	202		
7	McKinley Avenue	South of Yosemite	5	12	25	53	115		
8	Yosemite Avenue	West of McKinley	9	19	41	89	192		
9	Yosemite Avenue	McKinley to Airport	10	23	49	105	225		
10	Yosemite Avenue	East of Airport	18	38	82	176	378		
11	Wawona Street	East of Airport	4	8	17	36	78		
12	Daniels Street	East of Airport	14	31	66	143	308		
13	Atherton Drive	West of Airport	2	5	10	23	49		
14	Atherton Drive	East of Airport	1	3	6	14	30		
<u>Existing Plus Project</u>									
1	Airport Way	North of Yosemite	14	29	63	136	293		
2	Airport Way	Yosemite to Wawona	15	33	72	154	332		
3	Airport Way	Wawona to Daniels	15	32	70	151	324		
4	Airport Way	Daniels to Atherton	20	43	93	201	433		
5	Airport Way	South of Atherton	15	31	67	145	313		
6	McKinley Avenue	North of Yosemite	10	21	45	97	209		
7	McKinley Avenue	South of Yosemite	6	13	27	59	126		
8	Yosemite Avenue	West of McKinley	9	19	42	90	193		
9	Yosemite Avenue	McKinley to Airport	11	23	49	105	227		
10	Yosemite Avenue	East of Airport	18	39	83	179	386		
11	Wawona Street	East of Airport	4	8	17	37	80		
12	Daniels Street	East of Airport	15	32	68	146	315		
13	Atherton Drive	West of Airport	2	4	10	21	45		
14	Atherton Drive	East of Airport	1	3	6	14	30		

Appendix A-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2014-115 FEZ Master Plan
 Description: Cumulative and Cumulative Plus Project Traffic
 Ldn/CNEL: Ldn
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Airport Way	North of Yosemite	24,500	83		17	1	1	40	75	0
2	Airport Way	Yosemite to Wawona	20,200	83		17	1	1	40	75	0
3	Airport Way	Wawona to Daniels	22,000	83		17	1	1	40	75	0
4	Airport Way	Daniels to Atherton	32,700	83		17	1	1	40	100	0
5	Airport Way	South of Atherton	15,300	83		17	1	1	55	75	0
6	McKinley Avenue	North of Yosemite	14,000	83		17	1	1	50	200	0
7	McKinley Avenue	South of Yosemite	15,500	83		17	1	1	50	50	0
8	Yosemite Avenue	West of McKinley	11,300	83		17	1	1	45	100	0
9	Yosemite Avenue	McKinley to Airport	16,200	83		17	1	1	40	75	0
10	Yosemite Avenue	East of Airport	17,100	83		17	1	1	45	75	0
11	Wawona Street	East of Airport	2,400	83		17	1	1	40	50	0
12	Daniels Street	East of Airport	12,800	83		17	1	1	55	60	0
13	Atherton Drive	West of Airport	6,100	83		17	1	1	35	75	-5
14	Atherton Drive	East of Airport	6,600	83		17	1	1	35	75	-5
Cumulative Plus Project											
1	Airport Way	North of Yosemite	24,740	83		17	1	1	40	75	0
2	Airport Way	Yosemite to Wawona	20,930	83		17	1	1	40	75	0
3	Airport Way	Wawona to Daniels	22,800	83		17	1	1	40	75	0
4	Airport Way	Daniels to Atherton	31,300	83		17	1	1	40	100	0
5	Airport Way	South of Atherton	15,790	83		17	1	1	55	75	0
6	McKinley Avenue	North of Yosemite	14,150	83		17	1	1	50	200	0
7	McKinley Avenue	South of Yosemite	15,700	83		17	1	1	50	50	0
8	Yosemite Avenue	West of McKinley	11,350	83		17	1	1	45	100	0
9	Yosemite Avenue	McKinley to Airport	16,300	83		17	1	1	40	75	0
10	Yosemite Avenue	East of Airport	17,490	83		17	1	1	45	75	0
11	Wawona Street	East of Airport	2,450	83		17	1	1	40	50	0
12	Daniels Street	East of Airport	13,000	83		17	1	1	55	60	0
13	Atherton Drive	West of Airport	6,100	83		17	1	1	35	75	-5
14	Atherton Drive	East of Airport	6,600	83		17	1	1	35	75	-5

Appendix A-5

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2014-115 FEZ Master Plan
 Description: Cumulative and Cumulative Plus Project Traffic
 Ldn/CNEL: Ldn
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Airport Way	North of Yosemite	66.2	55.2	57.0	67.0
2	Airport Way	Yosemite to Wawona	65.3	54.3	56.1	66.1
3	Airport Way	Wawona to Daniels	65.7	54.7	56.5	66.5
4	Airport Way	Daniels to Atherton	65.5	54.5	56.3	66.3
5	Airport Way	South of Atherton	68.1	55.3	56.2	68.6
6	McKinley Avenue	North of Yosemite	60.1	47.8	49.0	60.7
7	McKinley Avenue	South of Yosemite	69.6	57.3	58.5	70.2
8	Yosemite Avenue	West of McKinley	62.4	50.7	52.2	63.1
9	Yosemite Avenue	McKinley to Airport	64.4	53.4	55.2	65.2
10	Yosemite Avenue	East of Airport	66.1	54.4	55.9	66.7
11	Wawona Street	East of Airport	58.7	47.7	49.5	59.5
12	Daniels Street	East of Airport	68.8	55.9	56.9	69.3
13	Atherton Drive	West of Airport	53.5	43.2	45.4	54.4
14	Atherton Drive	East of Airport	53.8	43.5	45.7	54.8
Cumulative Plus Project						
1	Airport Way	North of Yosemite	66.2	55.2	57.0	67.0
2	Airport Way	Yosemite to Wawona	65.5	54.5	56.3	66.3
3	Airport Way	Wawona to Daniels	65.8	54.8	56.7	66.6
4	Airport Way	Daniels to Atherton	65.3	54.3	56.2	66.1
5	Airport Way	South of Atherton	68.2	55.4	56.3	68.7
6	McKinley Avenue	North of Yosemite	60.2	47.9	49.1	60.7
7	McKinley Avenue	South of Yosemite	69.7	57.4	58.6	70.2
8	Yosemite Avenue	West of McKinley	62.4	50.7	52.2	63.1
9	Yosemite Avenue	McKinley to Airport	64.4	53.4	55.2	65.2
10	Yosemite Avenue	East of Airport	66.2	54.5	56.0	66.8
11	Wawona Street	East of Airport	58.8	47.8	49.6	59.6
12	Daniels Street	East of Airport	68.8	56.0	56.9	69.3
13	Atherton Drive	West of Airport	53.5	43.2	45.4	54.4
14	Atherton Drive	East of Airport	53.8	43.5	45.7	54.8

Appendix A-6

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2014-115 FEZ Master Plan
 Description: Cumulative and Cumulative Plus Project Traffic
 Ldn/CNEL: Ldn
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----						
			75	70	65	60	55		
1	Airport Way	North of Yosemite	22	47	101	218	470		
2	Airport Way	Yosemite to Wawona	19	41	89	192	413		
3	Airport Way	Wawona to Daniels	20	44	94	203	437		
4	Airport Way	Daniels to Atherton	26	57	123	264	569		
5	Airport Way	South of Atherton	28	60	130	280	603		
6	McKinley Avenue	North of Yosemite	22	48	103	222	479		
7	McKinley Avenue	South of Yosemite	24	51	110	238	512		
8	Yosemite Avenue	West of McKinley	16	34	74	160	344		
9	Yosemite Avenue	McKinley to Airport	17	36	77	165	356		
10	Yosemite Avenue	East of Airport	21	45	98	211	454		
11	Wawona Street	East of Airport	5	10	22	46	100		
12	Daniels Street	East of Airport	25	54	115	248	535		
13	Atherton Drive	West of Airport	3	7	15	32	69		
14	Atherton Drive	East of Airport	3	7	16	34	72		
<u>Cumulative Plus Project</u>									
1	Airport Way	North of Yosemite	22	47	102	219	473		
2	Airport Way	Yosemite to Wawona	20	42	91	196	423		
3	Airport Way	Wawona to Daniels	21	45	96	208	448		
4	Airport Way	Daniels to Atherton	26	55	119	257	553		
5	Airport Way	South of Atherton	29	62	133	286	616		
6	McKinley Avenue	North of Yosemite	22	48	104	224	482		
7	McKinley Avenue	South of Yosemite	24	52	111	240	517		
8	Yosemite Avenue	West of McKinley	16	35	74	160	345		
9	Yosemite Avenue	McKinley to Airport	17	36	77	166	358		
10	Yosemite Avenue	East of Airport	21	46	99	214	461		
11	Wawona Street	East of Airport	5	10	22	47	101		
12	Daniels Street	East of Airport	25	54	117	251	541		
13	Atherton Drive	West of Airport	3	7	15	32	69		
14	Atherton Drive	East of Airport	3	7	16	34	72		

Appendix B

2014-115 Manteca FEZ EIR

24hr Continuous Noise Monitoring - Site LT-1

Friday, February 21, 2014

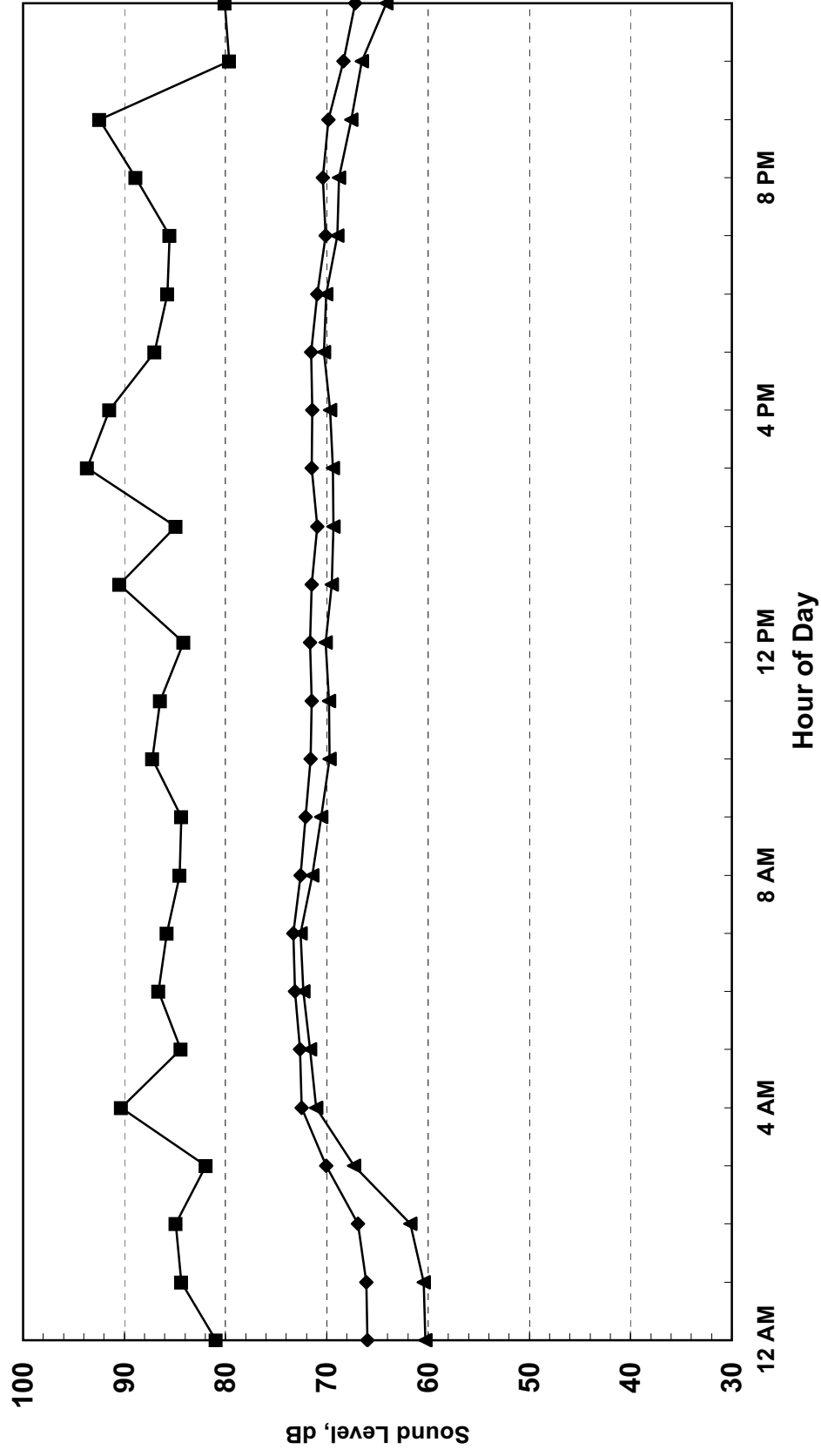
Hour	Leq	Lmax	L50	L90
0:00	66	81	60	54
1:00	66	84	60	52
2:00	67	85	62	53
3:00	70	82	67	59
4:00	72	90	71	66
5:00	73	84	72	67
6:00	73	87	72	68
7:00	73	86	73	69
8:00	73	85	71	67
9:00	72	84	71	65
10:00	72	87	70	64
11:00	72	86	70	65
12:00	72	84	70	65
13:00	72	91	70	65
14:00	71	85	69	64
15:00	72	94	69	64
16:00	71	91	70	65
17:00	72	87	70	66
18:00	71	86	70	66
19:00	70	86	69	64
20:00	70	89	69	63
21:00	70	92	68	62
22:00	68	80	67	60
23:00	67	80	64	57

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
Leq (Average)	High	Low	Average	High	Low	Average
Lmax (Maximum)	73	70	71	73	66	70
L50 (Median)	94	84	88	90	80	84
L90 (Background)	73	68	70	72	60	66
	69	62	65	68	52	60

Computed Ldn, dB	77
% Daytime Energy	70%
% Nighttime Energy	30%

Appendix B

2014-115 Manteca FEZ EIR
24hr Continuous Noise Monitoring - Site LT-1
Friday, February 21, 2014



Appendix B

2014-115 Manteca FEZ EIR

24hr Continuous Noise Monitoring - Site LT-1

Saturday, February 22, 2014

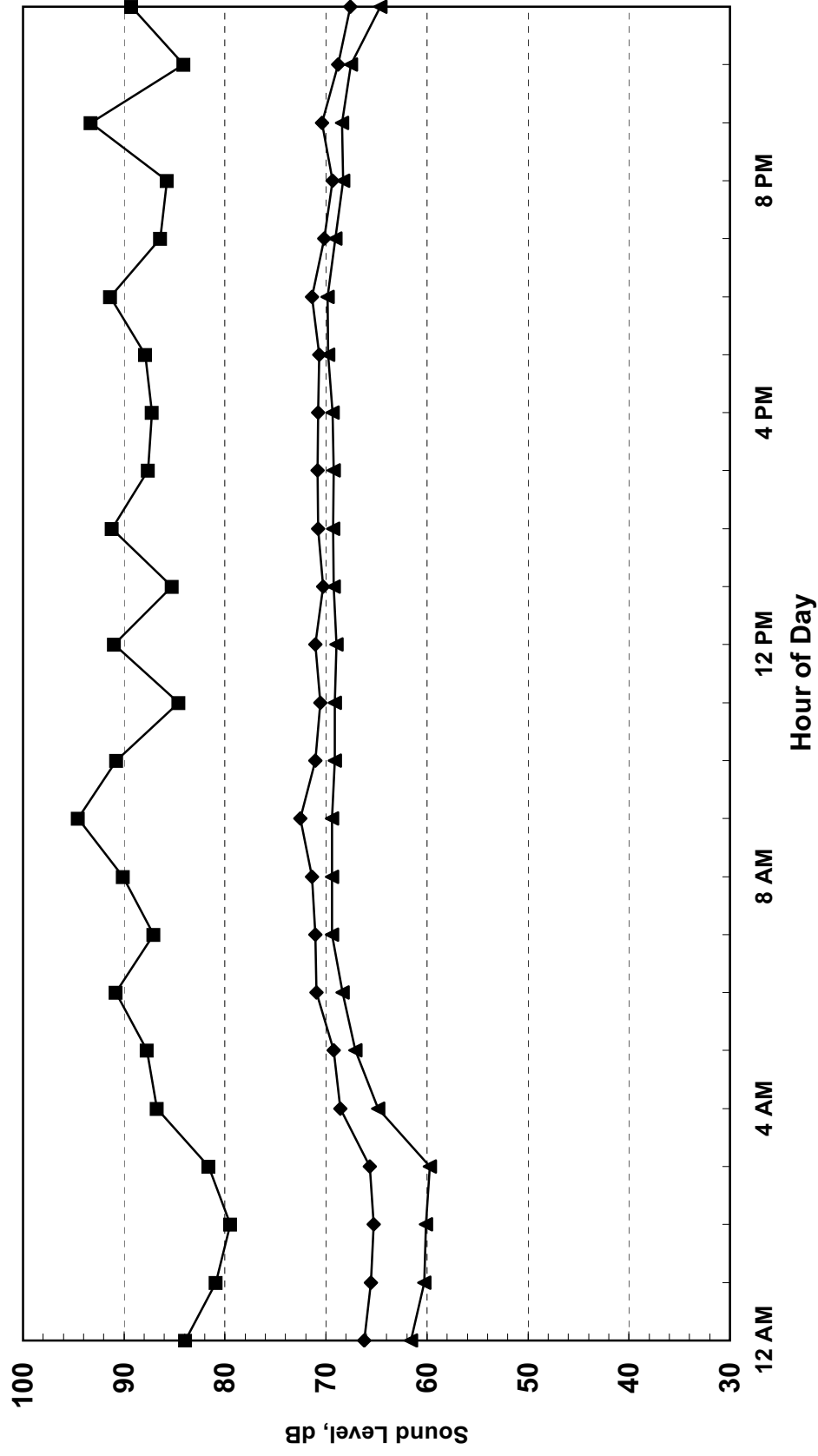
Hour	Leq	Lmax	L50	L90
0:00	66	84	62	54
1:00	66	81	60	53
2:00	65	79	60	53
3:00	66	82	60	51
4:00	69	87	65	56
5:00	69	88	67	59
6:00	71	91	68	62
7:00	71	87	69	63
8:00	71	90	69	64
9:00	73	95	69	64
10:00	71	91	69	64
11:00	71	85	69	64
12:00	71	91	69	64
13:00	70	85	69	64
14:00	71	91	69	64
15:00	71	88	69	64
16:00	71	87	69	65
17:00	71	88	70	65
18:00	71	91	70	65
19:00	70	86	69	64
20:00	69	86	68	62
21:00	70	93	68	62
22:00	69	84	68	61
23:00	68	89	65	57

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	73	69	71	71	65	68
Lmax (Maximum)	95	85	89	91	79	85
L50 (Median)	70	68	69	68	60	64
L90 (Background)	65	62	64	62	51	56

Computed Ldn, dB	75
% Daytime Energy	77%
% Nighttime Energy	23%

Appendix B

2014-115 Manteca FEZ EIR
24hr Continuous Noise Monitoring - Site LT-1
Saturday, February 22, 2014



Appendix B

2014-115 Manteca FEZ EIR

24hr Continuous Noise Monitoring - Site LT-2

Friday, February 21, 2014

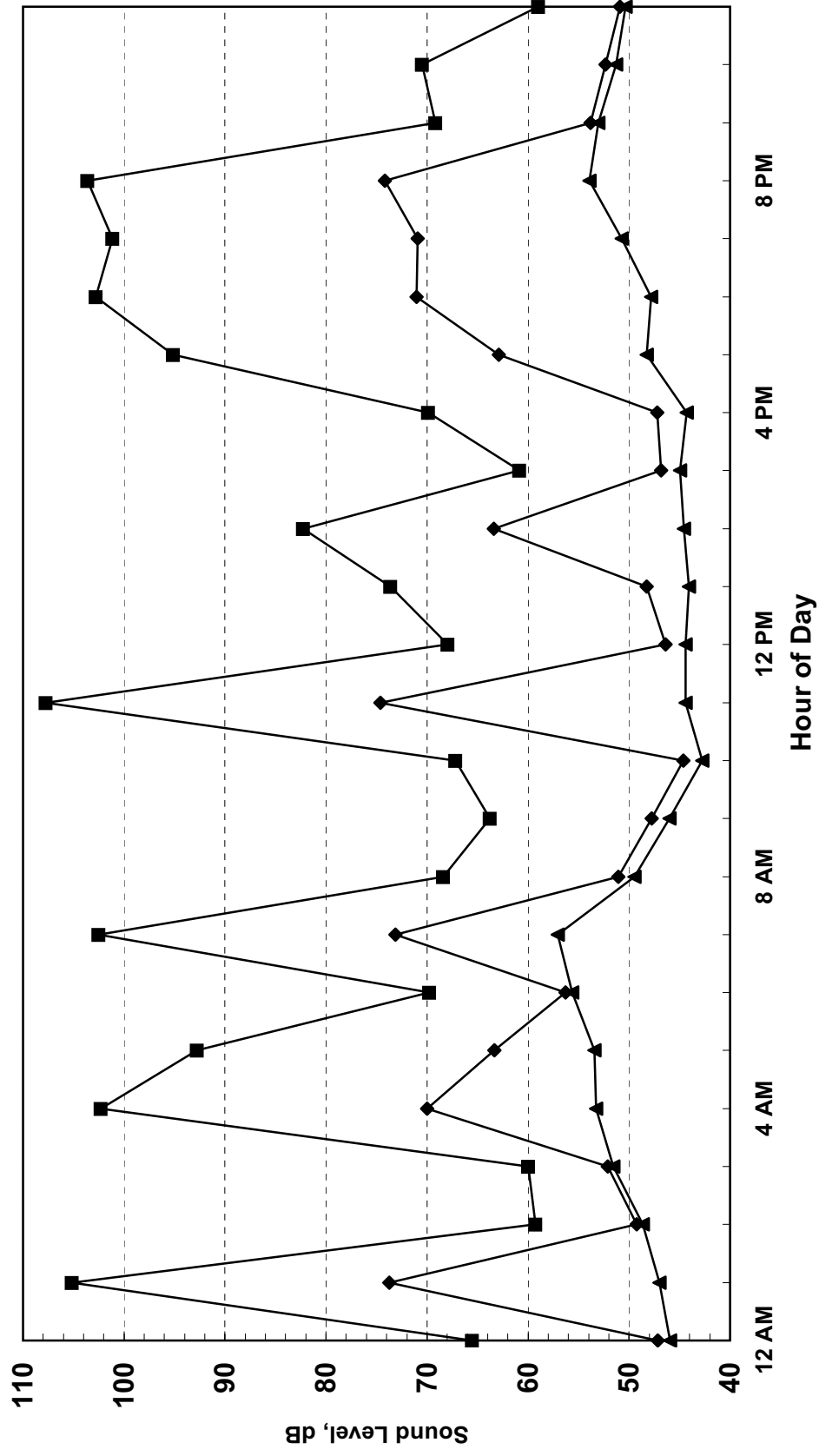
Hour	Leq	Lmax	L50	L90
0:00	47	66	46	44
1:00	74	105	47	44
2:00	49	59	49	46
3:00	52	60	52	49
4:00	70	102	53	51
5:00	63	93	53	51
6:00	56	70	56	54
7:00	73	103	57	55
8:00	51	68	49	47
9:00	48	64	46	44
10:00	45	67	43	41
11:00	75	108	44	42
12:00	46	68	44	42
13:00	48	74	44	42
14:00	63	82	45	42
15:00	47	61	45	42
16:00	47	70	44	42
17:00	63	95	48	44
18:00	71	103	48	46
19:00	71	101	51	48
20:00	74	104	54	52
21:00	54	69	53	51
22:00	52	70	51	48
23:00	51	59	50	48

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
Leq (Average)	High	Low	Average	High	Low	Average
Lmax (Maximum)	75	45	68	74	47	66
L50 (Median)	108	61	82	105	59	76
L90 (Background)	57	43	48	56	46	51
	55	41	45	54	44	48

Computed Ldn, dB	73
% Daytime Energy	74%
% Nighttime Energy	26%

Appendix B

2014-115 Manteca FEZ EIR
24hr Continuous Noise Monitoring - Site LT-2
Friday, February 21, 2014



Appendix B

2014-115 Manteca FEZ EIR

24hr Continuous Noise Monitoring - Site LT-2

Saturday, February 22, 2014

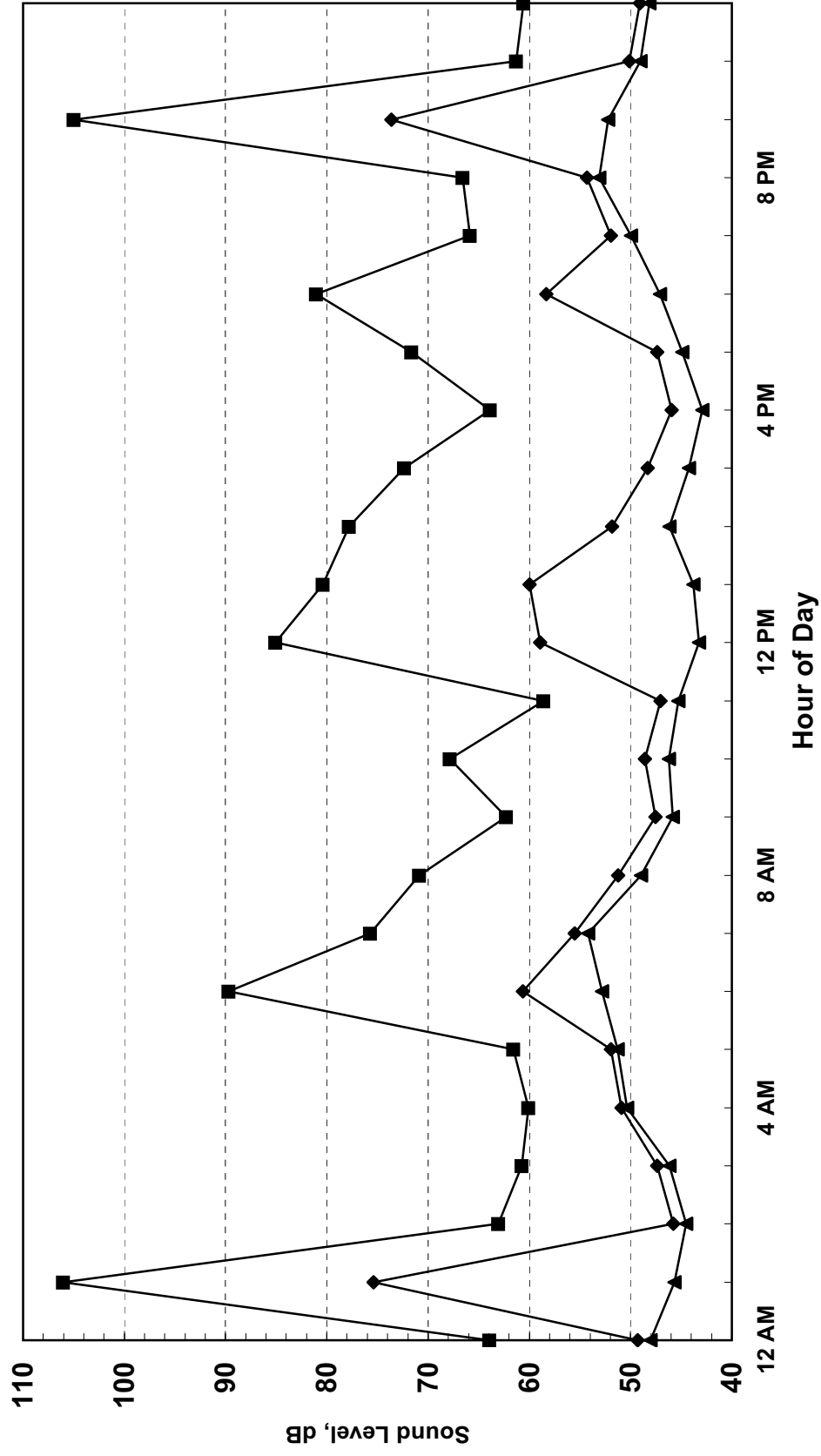
Hour	Leq	Lmax	L50	L90
0:00	49	64	48	45
1:00	75	106	46	43
2:00	46	63	45	42
3:00	47	61	46	43
4:00	51	60	50	48
5:00	52	62	51	49
6:00	61	90	53	51
7:00	56	76	54	52
8:00	51	71	49	45
9:00	48	62	46	44
10:00	49	68	46	43
11:00	47	59	45	42
12:00	59	85	43	40
13:00	60	80	44	41
14:00	52	78	46	43
15:00	48	72	44	41
16:00	46	64	43	40
17:00	47	72	45	42
18:00	58	81	47	45
19:00	52	66	50	47
20:00	54	67	53	50
21:00	74	105	52	50
22:00	50	61	49	47
23:00	49	61	48	46

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
Leq (Average)	High	Low	Average	High	Low	Average
Lmax (Maximum)	74	46	63	75	46	66
L50 (Median)	105	59	74	106	60	70
L90 (Background)	54	43	47	53	45	48
	52	40	44	51	42	46

Computed Ldn, dB	72
% Daytime Energy	42%
% Nighttime Energy	58%

Appendix B

2014-115 Manteca FEZ EIR
24hr Continuous Noise Monitoring - Site LT-2
Saturday, February 22, 2014



Appendix B

2014-115 Manteca FEZ EIR

24hr Continuous Noise Monitoring - Site LT-3

Friday, February 21, 2014

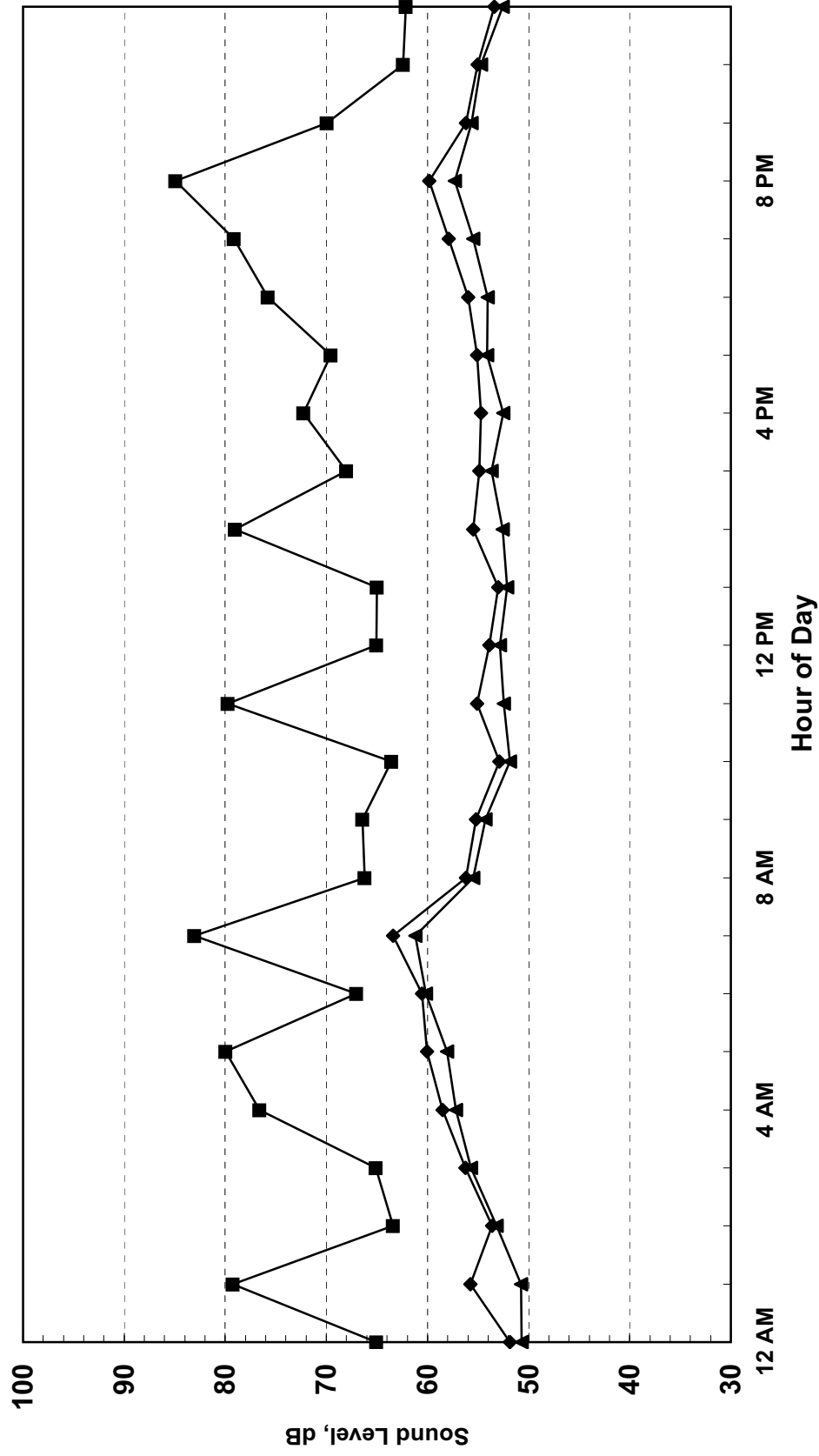
Hour	Leq	Lmax	L50	L90
0:00	52	65	51	48
1:00	56	79	51	48
2:00	54	63	53	50
3:00	56	65	56	53
4:00	59	77	57	55
5:00	60	80	58	56
6:00	61	67	60	58
7:00	63	83	61	59
8:00	56	66	55	53
9:00	55	66	54	52
10:00	53	64	52	49
11:00	55	80	52	50
12:00	54	65	53	51
13:00	53	65	52	50
14:00	55	79	53	50
15:00	55	68	54	51
16:00	55	72	53	50
17:00	55	70	54	52
18:00	56	76	54	52
19:00	58	79	55	53
20:00	60	85	57	55
21:00	56	70	56	53
22:00	55	62	55	51
23:00	53	62	53	50

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
Leq (Average)	High	Low	Average	High	Low	Average
Lmax (Maximum)	63	53	57	61	52	57
L50 (Median)	85	64	73	80	62	69
L90 (Background)	61	52	54	60	51	55
	59	49	52	58	48	52

Computed Ldn, dB	63
% Daytime Energy	62%
% Nighttime Energy	38%

Appendix B

2014-115 Manteca FEZ EIR
24hr Continuous Noise Monitoring - Site LT-3
Friday, February 21, 2014



Appendix B

2014-115 Manteca FEZ EIR

24hr Continuous Noise Monitoring - Site LT-3

Saturday, February 22, 2014

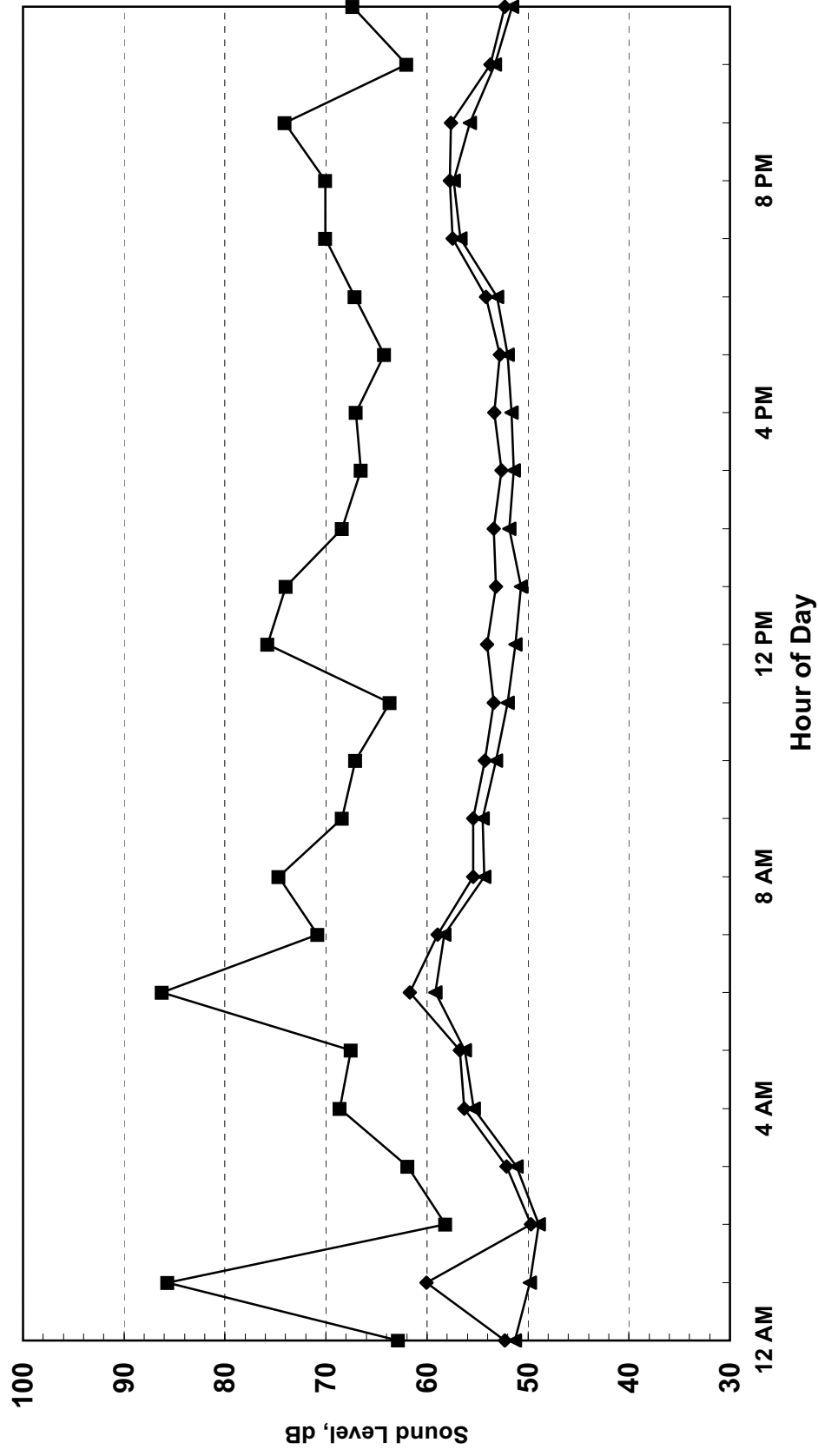
Hour	Leq	Lmax	L50	L90
0:00	52	63	51	48
1:00	60	86	50	46
2:00	50	58	49	46
3:00	52	62	51	47
4:00	56	69	55	52
5:00	57	68	56	54
6:00	62	86	59	57
7:00	59	71	58	56
8:00	55	75	54	52
9:00	55	68	55	52
10:00	54	67	53	51
11:00	53	64	52	49
12:00	54	76	51	49
13:00	53	74	51	48
14:00	53	68	52	49
15:00	53	67	51	49
16:00	53	67	52	49
17:00	53	64	52	50
18:00	54	67	53	51
19:00	57	70	57	55
20:00	58	70	57	55
21:00	58	74	56	54
22:00	54	62	53	51
23:00	52	67	52	49

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
Leq (Average)	High	Low	Average	High	Low	Average
Lmax (Maximum)	59	53	55	62	50	57
L50 (Median)	76	64	69	86	58	69
L90 (Background)	58	51	54	59	49	53
	56	48	51	57	46	50

Computed Ldn, dB	63
% Daytime Energy	55%
% Nighttime Energy	45%

Appendix B

2014-115 Manteca FEZ EIR
24hr Continuous Noise Monitoring - Site LT-3
Saturday, February 22, 2014



Appendix B

2014-115 Manteca FEZ EIR

24hr Continuous Noise Monitoring - Site LT-4

Friday, February 21, 2014

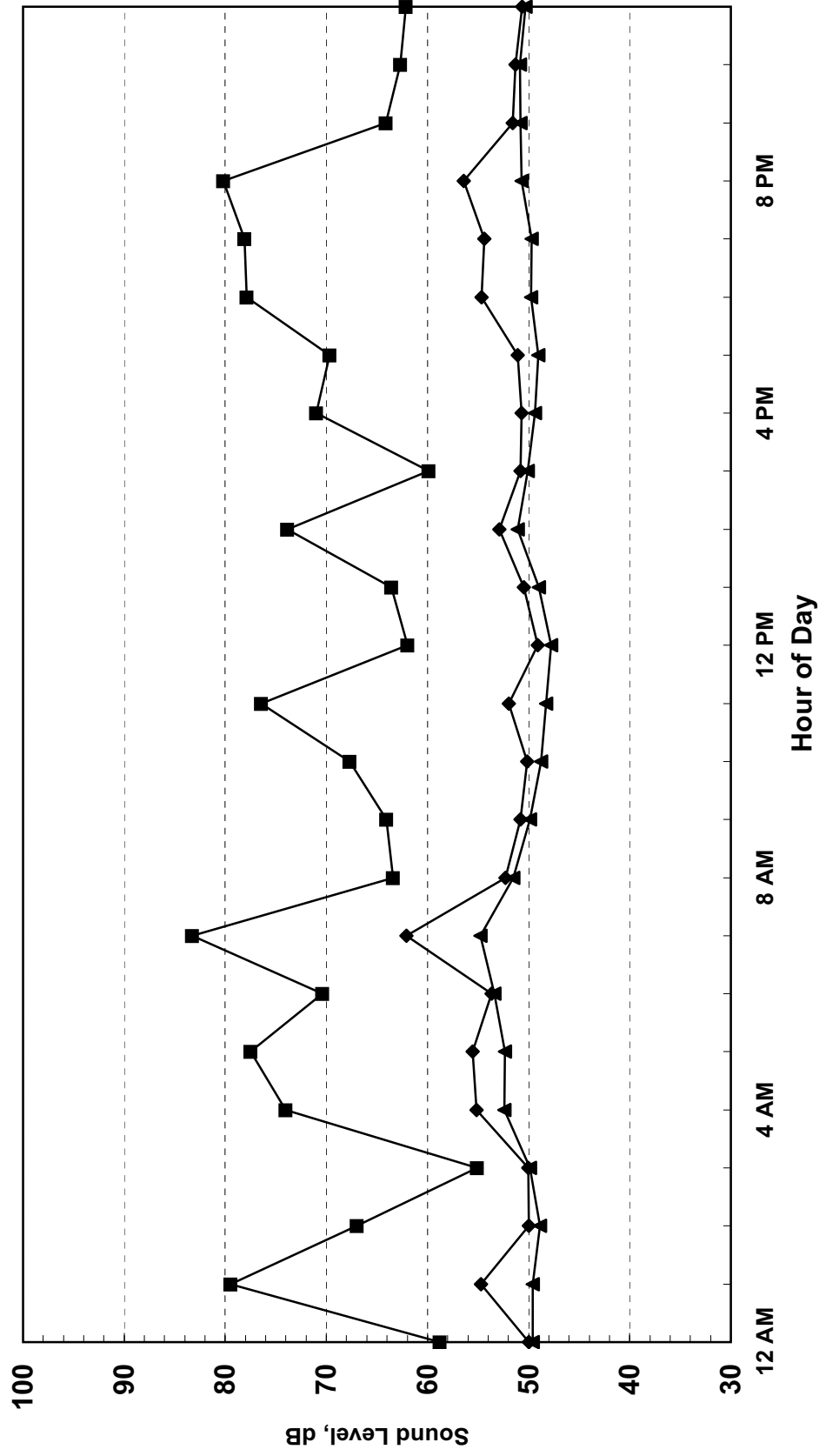
Hour	Leq	Lmax	L50	L90
0:00	50	59	50	48
1:00	55	79	50	48
2:00	50	67	49	47
3:00	50	55	50	48
4:00	55	74	52	51
5:00	56	78	52	51
6:00	54	70	53	52
7:00	62	83	55	53
8:00	52	63	52	49
9:00	51	64	50	48
10:00	50	68	49	47
11:00	52	76	48	46
12:00	49	62	48	46
13:00	50	64	49	47
14:00	53	74	51	48
15:00	51	60	50	48
16:00	51	71	49	47
17:00	51	70	49	48
18:00	55	78	50	48
19:00	54	78	50	48
20:00	56	80	51	49
21:00	52	64	51	49
22:00	51	63	51	49
23:00	51	62	50	49

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
Leq (Average)	High	Low	Average	High	Low	Average
Lmax (Maximum)	62	49	54	56	50	53
L50 (Median)	83	60	70	79	55	67
L90 (Background)	55	48	50	53	49	51
	53	46	48	52	47	49

Computed Ldn, dB	60
% Daytime Energy	70%
% Nighttime Energy	30%

Appendix B

2014-115 Manteca FEZ EIR
24hr Continuous Noise Monitoring - Site LT-4
Friday, February 21, 2014



Appendix B

2014-115 Manteca FEZ EIR

24hr Continuous Noise Monitoring - Site LT-4

Saturday, February 22, 2014

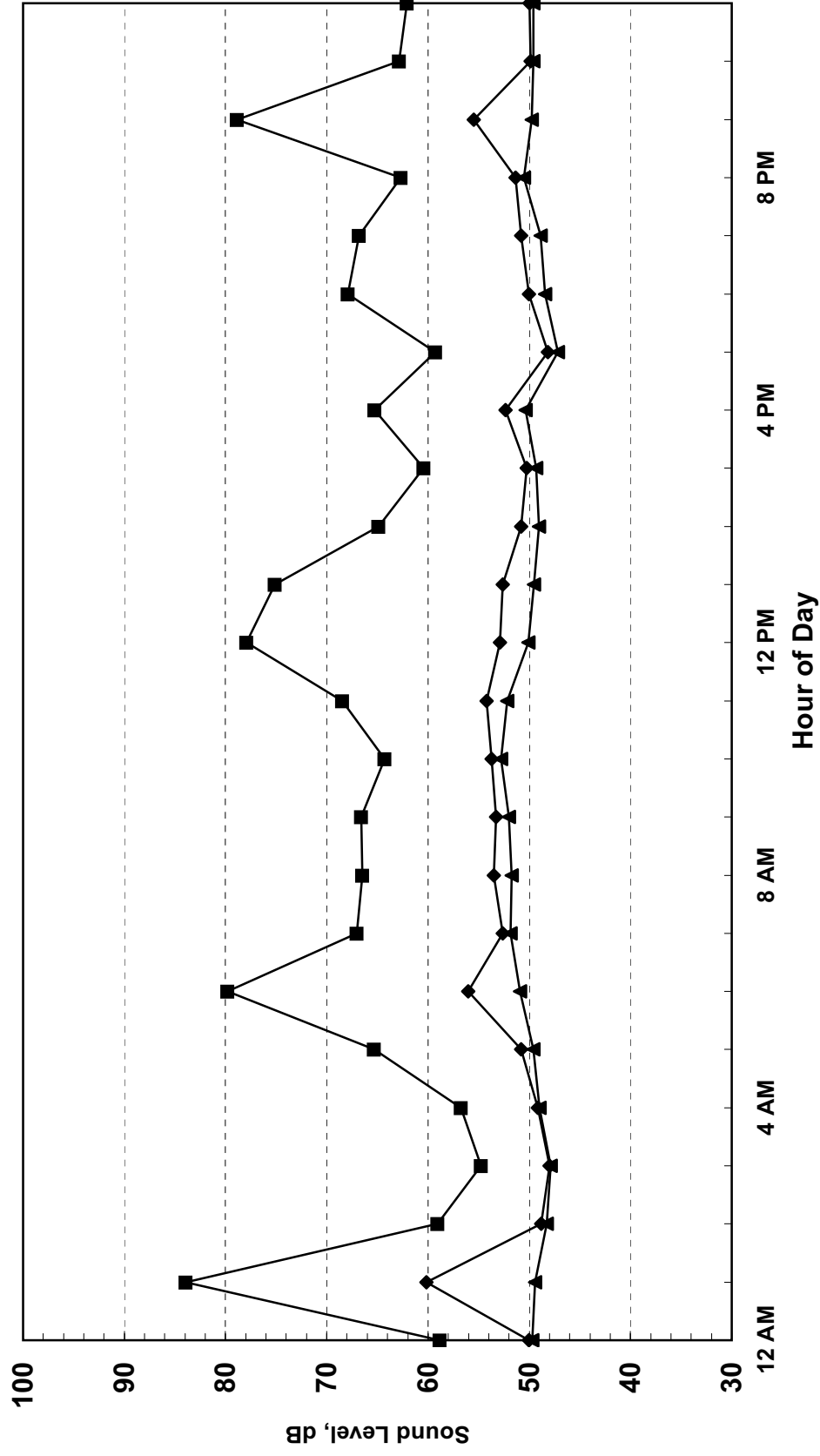
Hour	Leq	Lmax	L50	L90
0:00	50	59	50	48
1:00	60	84	49	48
2:00	49	59	48	47
3:00	48	55	48	47
4:00	49	57	49	48
5:00	51	65	50	48
6:00	56	80	51	49
7:00	53	67	52	50
8:00	54	66	52	49
9:00	53	67	52	49
10:00	54	64	53	49
11:00	54	68	52	49
12:00	53	78	50	47
13:00	53	75	50	47
14:00	51	65	49	46
15:00	50	60	49	47
16:00	52	65	50	48
17:00	48	59	47	46
18:00	50	68	48	47
19:00	51	67	49	47
20:00	51	63	51	49
21:00	56	79	50	48
22:00	50	63	50	48
23:00	50	62	50	48

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
Leq (Average)	High	Low	Average	High	Low	Average
Lmax (Maximum)	56	48	53	60	48	54
L50 (Median)	79	59	67	84	55	65
L90 (Background)	53	47	50	51	48	49
	50	46	48	49	47	48

Computed Ldn, dB	60
% Daytime Energy	56%
% Nighttime Energy	44%

Appendix B

2014-115 Manteca FEZ EIR
24hr Continuous Noise Monitoring - Site LT-4
Saturday, February 22, 2014



Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2014-115 FEZ Master Plan EIR

Description: Cumulative + Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name - Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hwy. Trucks	Speed	Distance	Offset (dB)
1	Hotel Façade - 1st Floor	130,200	70		30	1	5	65	210	
2	Hotel Façade - Upper Floors	130,200	70		30	1	5	65	210	3
3	Hotel Pool Area	130,200	70		30	1	5	65	500	-10
4	PA-6 Recreation Area	130,200	70		30	1	5	65	750	

Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2014-115 FEZ Master Plan EIR

Description: Cumulative + Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name - Segment	Autos	Medium Trucks	Heavy Trucks	Total
1	Hotel Façade - 1st Floor	74	61	71	76
2	Hotel Façade - Upper Floors	77	64	74	79
3	Hotel Pool Area	59	45	55	60
4	PA-6 Recreation Area	66	52	63	68

Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2014-115 FEZ Master Plan EIR
Description: Cumulative + Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name - Segment	----- Distances to Traffic Noise Contours -----				
		75	70	65	60	55
1	Hotel Façade - 1st Floor	248	534	1150	2477	5337
2	Hotel Façade - Upper Floors	393	846	1822	3926	8459
3	Hotel Pool Area	53	115	248	534	1150
4	PA-6 Recreation Area	248	534	1150	2477	5337