

## 4.0 HAZARDS, SAFETY, AND NOISE

Issues and topics related to health, safety, and noise within the Planning Area are addressed in this chapter. Some of these hazards may be naturally induced, such as wildfire hazards. Other health and safety hazards may be the result of natural hazards, which are exacerbated by human activity, such as development in areas prone to flooding. Additional hazards are entirely human-made, including airport crash hazards and exposure to hazardous materials.

This chapter is divided into the following sections:

- 4.1 Hazards and Hazardous Materials
- 4.2 Air Traffic
- 4.3 Fire Hazards
- 4.4 Flooding
- 4.5 Noise

### 4.1 HAZARDS AND HAZARDOUS MATERIALS

A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety or the environment when improperly treated, stored, transported, or disposed of. Hazardous materials are mainly present because of industries involving chemical byproducts from manufacturing, petrochemicals, and hazardous building materials.

Hazardous waste is the subset of hazardous materials that has been abandoned, discarded, or recycled and is not properly contained, including contaminated soil or groundwater with concentrations of chemicals, infectious agents, or toxic elements sufficiently high to increase human mortality or to destroy the ecological environment. If a hazardous material is spilled and cannot be effectively picked up and used as a product, it is considered to be hazardous waste. If a hazardous material site is unused, and it is obvious there is no realistic intent to use the material, it is also considered to be a hazardous waste. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals.

## REGULATORY FRAMEWORK

### *FEDERAL*

#### **Comprehensive Environmental Response, Compensation & Liability Act (CERCLA)**

This act, commonly associated with the term “Superfund,” established:

- Regulations concerning closed and abandoned hazardous waste sites
- Liability of parties responsible for any releases of hazardous waste at these sites
- Funding for cleanup when responsible parties cannot be identified

### **Resource Conservation and Recovery Act (RCRA)**

This act established EPA's "cradle to grave" control (generation, transportation, treatment, storage, and disposal) over hazardous materials and wastes. In California, the Department of Toxic Substances Control (DTSC) has RCRA authorization.

### **Clean Air Act**

In according with the Clean Air Act, the EPA has established National Emissions Standards for Hazardous Air Pollutants. Exceeding the emissions standard for a given air pollutant may cause an increase in illnesses and/or fatalities.

### **Clean Water Act (CWA)**

The CWA, which amended the WPCA of 1972, sets forth the Section 404 program to regulate the discharge of dredged and fill material into Waters of the U.S. and the Section 402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the U.S. The Section 401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of Federal permits and approvals (including CWA Section 404, CWA Section 402, FERC Hydropower and Section 10 Rivers and Harbors).

### *STATE*

### **California Health & Safety Code**

Division 20 of the Health and Safety Code establishes Department of Toxic Substances Control (DTSC) authority and sets forth hazardous waste and underground storage tank regulations. In addition, the division creates a State superfund framework that mirrors the Federal program.

Division 26 of the Health and Safety Code establishes California Air Resources Board (CARB) authority. The division designates CARB as the air pollution control agency per Federal regulations and charges the Board with meeting Clean Air Act requirements.

### **Food and Agriculture Code**

Division 6 of the California Food and Agricultural Code (FAC) establishes pesticide application regulations. The division establishes training standards for pilots conducting aerial applications as well as permitting and certification requirements.

### **Water Code**

Division 7 of the California Water Code, commonly referred to as the Porter-Cologne Water Quality Control Act, created the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB). In addition, water quality responsibilities are established for the SWRCB and RWQCBs.

### **California Code of Regulations**

Title 3 of the CCR pertains to the application of pesticides and related chemicals. Parties applying regulated substances must continuously evaluate application equipment, the weather, the treated lands and all surrounding properties. Title 3 prohibits any application that would:

- Contaminate persons not involved in the application
- Damage non-target crops or animals or any other public or private property
- Contaminate public or private property or create health hazards on said property

Title 8 of the CCR establishes California Occupational Safety and Health Administration (Cal OSHA) requirements related to public and worker protection. Topics addressed in Title 8 include materials exposure limits, equipment requirements, protective clothing, hazardous materials, and accident prevention. Construction safety and exposure standards for lead and asbestos are set forth in Title 8.

Title 14 of the CCR establishes minimum standards for solid waste handling and disposal.

Title 17 of the CCR establishes regulations relating to the use and disturbance of materials containing naturally occurring asbestos.

Title 22 of the CCR sets forth definitions of hazardous waste and special waste. The section also identifies hazardous waste criteria and establishes regulations pertaining to the storage, transport, and disposal of hazardous waste.

Title 26 of the CCR is a medley of State regulations pertaining to hazardous materials and waste that are presented in other regulatory sections. Title 26 mandates specific management criteria related to hazardous materials identification, packaging, and disposal. In addition, Title 26 establishes requirements for hazardous materials transport, containment, treatment, and disposal. Finally, staff training standards are set forth in Title 26.

Title 27 of the CCR sets forth a variety of regulations relating to the construction, operation and maintenance of the State's landfills. The title establishes a landfill classification system and categories of waste. Each class of landfill is constructed to contain specific types of waste (household, inert, special, and hazardous).

### *LOCAL*

#### **City of Manteca General Plan**

The current City of Manteca General Plan identifies the following policy framework related to hazardous materials and waste:

##### **Safety Element**

**GOAL S-1: Prevent loss of lives, injury, and property damage due to geological hazards and seismic activity.**

**GOAL S-2: Prevent loss of lives, injury, and property damage due to the collapse of buildings and critical facilities, and to prevent disruption of essential services in the event of an earthquake.**

**POLICY S-P-1:** The City shall require preparation of geological reports and/or geological engineering reports for proposed new development located in areas of potentially significant geological hazards, including potential subsidence (collapsible surface soils) due to groundwater extraction.

**POLICY S-P-2:** The City shall require new development to mitigate the potential impacts of geologic hazards through Building Plan review.

**POLICY S-P-3:** The City shall require new development to mitigate the potential impacts of seismic induced settlement of uncompacted fill and liquefaction (water-saturated soil) due to the presence of a high water table.

**POLICY S-P-4:** The City shall maintain an inventory of pre-1940 unreinforced masonry buildings within the city. No change in use to a higher occupancy or more intensive use shall be approved in such

structures until an engineering evaluation of the structure has been conducted and any structural deficiencies corrected. The Redevelopment Agency shall be encouraged to assist property owners in reinforcing buildings.

**POLICY S-P-5:** The City shall ensure that all public facilities, such as buildings, water tanks, and reservoirs, are structurally sound and able to withstand seismic shaking and the effects of seismically induced ground failure.

**POLICY S-P-6:** The City shall comply with the California State seismic and building standards in the design and siting of critical facilities, including police and fire stations, school facilities, hospitals, hazardous materials manufacturing and storage facilities, and large public assembly halls.

IMPLEMENTATION S-I-1: All new development shall comply with the current Uniform Building Code (UBC) requirements that stipulate building structural material and reinforcement.

IMPLEMENTATION S-I-2: All new development shall comply with California Health and Safety Code Section 19100 et seq. (Earthquake Protection Law), which requires that buildings be designed to resist stresses produced by natural forces such as earthquakes and wind.

IMPLEMENTATION S-I-3: The City shall inventory potentially hazardous buildings within the city and adopt a mitigation program, including requirements for strengthening buildings, changing the use of the buildings to an acceptable occupancy level, or demolishing the buildings.

**GOAL S-3: Prevent loss of lives, injury, and property damage due to flooding.**

**GOAL S-4: Pursue flood control solutions that minimize environmental impacts.**

**POLICY S-P-7:** Regulate all uses and development in areas subject to potential flooding through zoning and other land use regulations.

**POLICY S-P-8:** Cooperate with other agencies in the pursuit of a regional approach to flood issues.

**POLICY S-P-9:** Combine flood control, recreation, water quality, and open space functions where feasible.

**POLICY S-P-10:** Ensure that any existing structures subject to the 100-year flood provide adequate protection from flood hazards.

**POLICY S-P-11:** Ensure that the impacts of potential flooding are adequately analyzed when considering areas for future urban expansion.

**POLICY S-P-12:** New residential development, including mobilehomes, shall be constructed so that the lowest floor is at least one foot above the 100-year flood level.

**POLICY S-P-13:** Non-residential development shall be anchored and flood-proofed in accord with Federal Emergency Management Agency (FEMA) standards to prevent damage or causing damage due to a 100-year flood or, alternatively, elevated to at least one foot above the 100-year flood level.

**POLICY S-P-14:** When improvements to existing developments are made costing at least 50 percent of the current market value of the structure before improvements, the structure shall be brought into compliance with FEMA standards.

IMPLEMENTATION S-I-4: The City shall continue to participate in the National Flood Insurance Program. To this end, the City shall ensure that local regulations are in full compliance with standards adopted by the Federal Emergency Management Agency (FEMA). The City shall adopt and implement local flood management development standards.

IMPLEMENTATION S-I-5: Provide flood warning and forecasting information to City residents.

IMPLEMENTATION S-I-6: Discourage large continuous paved areas unless provided with engineered drainage facilities.

IMPLEMENTATION S-I-7: Where feasible, require the use of pervious paving materials, such as brick or stepping stones with sand joints.

IMPLEMENTATION S-I-8: New development shall be required to maintain natural stream courses and adjacent habitat and combine flood control, recreation, water quality, and open space functions.

**GOAL S-5: The City shall protect the health, safety, natural resources, and property through regulation of use, storage, transport, and disposal of hazardous materials.**

**POLICY S-P-15:** The City shall maintain an awareness of hazardous materials throughout the Manteca region.

**POLICY S-P-16:** City approvals of all new development shall consider the potential for the production, use, storage, and transport of hazardous materials and provide for reasonable controls on such hazardous materials.

**POLICY S-P-17:** Within its authority, the City shall regulate the production, use, storage, and transport of hazardous materials to protect the health of Manteca residents.

IMPLEMENTATION S-I-9: The City shall require businesses that manufacture, store, use, or transport significant quantities of hazardous materials to identify annually such materials and their quantities.

IMPLEMENTATION S-I-10: The City shall require the submittal of lists of hazardous materials used in existing and proposed industrial and commercial businesses within the City of Manteca. The list shall be maintained through the Manteca Fire Department and updated through periodic review.

IMPLEMENTATION S-I-11: The City shall work with San Joaquin County and other public agencies to inform consumers about household use and disposal of hazardous materials.

IMPLEMENTATION S-I-12: Cooperate fully with Union Pacific Railroad and other agencies, such as the CHP, in the event of a hazardous material emergency.

IMPLEMENTATION S-I-13: Continue the City hazardous waste pick-up program for household hazardous materials.

**GOAL S-6: Ensure that City emergency procedures are adequate in the event of potential natural or man-made disasters.**

**POLICY S-P-18:** The City shall maintain and periodically update the City's Emergency Plan.

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IMPLEMENTATION S-I-14: The City shall conduct periodic emergency response exercises to test the effectiveness of City emergency response procedures.

IMPLEMENTATION S-I-15: The City shall review County and State emergency response procedures that must be coordinated with City procedures.

### ENVIRONMENTAL SETTING

#### Envirostor Data Management System

The DTSC maintains the *Envirostor Data Management System*, which provides information on hazardous waste facilities (both permitted and corrective action) as well as any available site cleanup information. This site cleanup information includes: Federal Superfund Sites (NPL), State Response Sites, Voluntary Cleanup Sites, School Cleanup Sites, Corrective Action Sites, Tiered Permit Sites, and Evaluation / Investigation Sites. The hazardous waste facilities include: Permitted–Operating, Post-Closure Permitted, and Historical Non-Operating.

There are 19 locations with a Manteca address that are listed in the Envirostor database. Ten sites are listed as school investigation sites with no action required, one site is listed as a school investigation site which requires further evaluation, two sites were listed as active and are under state cleanup programs, two sites were listed as no further action, two sites were listed as inactive and need further evaluation, one site was referred to the RWQCB, and one site is a voluntary cleanup site that has land use restrictions. Table 4.1-1 lists the active sites and the inactive (needs evaluation or action required) sites within Manteca. Following the table is a background discussion of these sites.

**TABLE 4.1-1: MANTECA SITE CLEANUP AND HAZARDOUS FACILITIES LIST (ENVIROSTOR)**

NAME	STATUS DATE	LOCATION
<i>ACTIVE – STATE RESPONSE</i>		
Gordon Research Company	10/15/2007	1085 South Union Road
Nur-Al-Huda Academy	10/3/2014	1085 South Union Road
<i>INACTIVE – NEEDS EVALUATION (TIERED PERMIT)</i>		
ISE Labs, Inc., Assembly Operations	N/A	400 Industrial Park Drive
Qualex, Inc. - Manteca	N/A	555 Industrial Park Drive
<i>INACTIVE – NEEDS EVALUATION (SCHOOL INVESTIGATION)</i>		
Proposed Manteca High School Addition	10/17/2007	206, 216 & 220 South Garfield Avenue
<i>INACTIVE – ACTION REQUIRED (VOLUNTARY CLEANUP)</i>		
Satellite Housing	3/16/2009	280 and 282 North Airport
<i>REFER – OTHER AGENCY (EVALUATION)</i>		
Schmiedt Soil Service, Inc.	3/7/1996	20696 South Manteca Road

SOURCE: CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, ENVIROSTOR DATABASE, 2016.

#### ACTIVE SITES

The Gordon Research Company site is located within a residential district of Manteca. The southwestern corner of the property abuts the northwestern corner of the Brock Elliot Elementary School.

According to information provided by the DTSC, state and local agencies involvement in the site began in 1984 in response to a complaint. An inspection by agency representatives revealed that Mr. Larry Gordon was engaged in chemical reformulation and repackaging of chemicals for resale without the

required permits. A review of the available DTSC file revealed that prior to 1988, a chemical formulation, repackaging and resale businesses operated at the Site. The businesses were known as Gordon Research Company and U.S. Gordon Subproperty. These businesses purchased bulk chemicals and stored them at the site. In 1984, in response to a complaint received by the State of California DHS, a predecessor to DTSC, conducted an inspection at the site. The inspection revealed activities for which the operator did not hold the required permits. By December 1985, DHS inspections found that most of the chemicals were removed from the site.

From 1984 through 1986, the San Joaquin County District Attorney's Office along with the California Department of Health Services (DHS) conducted enforcement actions. In 1986, a permanent injunction was obtained prohibiting Mr. Gordon from handling, treating, storing, or disposing of hazardous substances or wastes.

In 1988, the site was inspected by DHS staff, the Manteca Fire Department, and the county District Attorney's office. At the time of the inspection, a portion of the property was surrounded by a fence. Within the fenced area, approximately 10 to 20 drums with markings similar to military specifications were noted. These drums contained products used by the property owner in maintaining equipment used in the commercial/agricultural operations. A 2007 inspection noted unlabeled containers, high pressure cylinders, and open containers with handwritten notations; some of these containers were deteriorated and leaking.

In October of 2007, San Joaquin County Environmental Health Department conducted an inspection which revealed wastes accumulated and potentially being deposited into the soil at the site. Reportedly, trespassers are scavenging for recyclable or salable materials, or squatting on the site. A deceased owner of the property operated numerous commercial ventures at the site and maintained a residence at the property. The county requested DTSC oversight of the removal and disposal of the improperly stored chemicals at the site.

On November 28, 2007, the DTSC issued an Imminent and Substantial Determination and Order that specified the assessment and remedies necessary to address existing conditions at the site. In response, the property owner representatives (the Gordon Family Trust) began removing unlabeled containers, high-pressure cylinders, and debris; however, the Gordon Family Trust was unable to finish the required activities in 2009. The DTSC obtained the necessary funds to complete the removal action. Between 2010 and 2011, DTSC conducted a Preliminary Endangerment Assessment where soil and groundwater samples were taken from the property in order to determine extent of contamination.

The Nur-Al-Huda Academy site is located within a residential district of Manteca. The southwestern corner of the property abuts the northwestern corner of the Brock Elliot Elementary School. As shown in Table 4.1-1, this site is located on the same site as the Gordon Research Company site. The Nur-Al-Huda Academy site property owner is working with DTSC to remediate the site in order to establish a school, Nur-Al-Huda Academy, on the site.

In response to the Imminent & Substantial Determination and Order issued by the DTSC in 2007, representatives of the property owner have constructed and maintained site fencing, submitted a draft public participation plan, and a draft chemical identification and disposal plan. Once the plan is approved, all of the containers and vessels will be located, assessed, and if necessary packaged for off-site disposal. Following this removal, soil sampling will occur to determine if there has been an impact to the soil.

**Cortese List**

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California Environmental Protection Agency to develop at least annually an updated Cortese List. California Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List. There are no hazardous materials release sites located in the Planning Area.

**GeoTracker**

GeoTracker is the California Water Resource Control Board’s data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Underground Storage Tanks, Department of Defense, Site Cleanup Program) as well as permitted facilities such as operating USTs and land disposal sites.

*LEAKING UNDERGROUND STORAGE TANKS (LUST)*

There are 60 locations with a Manteca address that are listed in the GeoTracker database for Leaking Underground Storage Tanks (LUST). Fifty-eight of the locations have undergone LUST cleanup and the State has closed the case. There two six locations in Manteca with an open case. Table 4.1-2 lists the location of open and closed cases for LUSTs in Manteca.

**TABLE 4.1-2: MANTECA LUST CLEANUP SITES**

NAME	ACTIVITY	LOCATION
<i>OPEN CASES</i>		
Frank's One Stop	Open - Verification Monitoring	2072 Yosemite Ave W
Rainwater Car Wash	Open - Verification Monitoring	420 Yosemite Ave W
<i>CLOSED CASES (CLEANUP COMPLETED)</i>		
7-11 Store #2243-17647	Completed - Case Closed	1048 Yosemite Ave W
7-Eleven Store #21756	Completed - Case Closed	853 Yosemite Ave E
ABF Freight	Completed - Case Closed	2427 Yosemite Ave W
Ace Tomato Co Inc	Completed - Case Closed	2771 E. French Camp Rd
Arco #6020 Case #2	Completed - Case Closed	1711 Yosemite Ave E
Arco #6020 Case #1	Completed - Case Closed	1711 Yosemite Ave E
Beacon #3-492	Completed - Case Closed	470 Main St N
Bob's Muffler	Completed - Case Closed	466 Moffat Blvd
Boyett Petroleum	Completed - Case Closed	419 Main St S
Brophy Texaco (Former)	Completed - Case Closed	941 Yosemite Ave E
Cal-West Concrete Cutting Inc	Completed - Case Closed	1153 Vanderbilt Cir
Cardoza Enterprises	Completed - Case Closed	1151 Louise
Carl Karcher Enterprises	Completed - Case Closed	800 Mellon St
Carrol/Richie Property	Completed - Case Closed	443 Sycamore Ave
Center Plumbing	Completed - Case Closed	2001 Main St N
Chevron #9-1848	Completed - Case Closed	1257 Yosemite Ave W
City Of Manteca	Completed - Case Closed	210 Wetmore St E
City Of Manteca Public Works	Completed - Case Closed	220 Oak St



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<i>NAME</i>	<i>ACTIVITY</i>	<i>LOCATION</i>
Claudio Dell'eva	Completed - Case Closed	260 Main St S
Delicato Vineyards	Completed - Case Closed	12001 Hwy 99 S
Diamond Lumber	Completed - Case Closed	151 Main St S
E-Z Serve #100878	Completed - Case Closed	1012 Yosemite Ave W
Eckert Cold Storage	Completed - Case Closed	757 Moffat Blvd
Food & Liquor #76	Completed - Case Closed	890 Main St N
Frank's Exxon #2	Completed - Case Closed	1399 Yosemite Ave E
Frank's Exxon #4	Completed - Case Closed	14800 Frontage Rd W & Hwy 99 S
House Of Redwood	Completed - Case Closed	1199 Vanderbilt Cir
Jackpot Food Mart	Completed - Case Closed	1434 Yosemite Ave W
Jiffy Lube	Completed - Case Closed	1130 Main St N
Karlson Bros Trucking	Completed - Case Closed	23675 Airport Way S
Lathrop Gas And Food Mart	Completed - Case Closed	14800 West Frontage Road, Hwy 99
Lee Jennings Enterprises	Completed - Case Closed	815 Moffat Blvd
Manteca Bean	Completed - Case Closed	229 Moffat Blvd
Manteca Equipment Rental	Completed - Case Closed	616 Main St S
Manteca School Dist (Case #1)	Completed - Case Closed	2901 Louise Ave E
Manteca Unified School Dist	Completed - Case Closed	2901 Louise Ave (Case #2)
Manteca Unified School Dist	Completed - Case Closed	660 Mikesell Rd
Manteca-Lathrop Fire Protect.	Completed - Case Closed	9121 Lathrop Rd E
MBP-Manteca	Completed - Case Closed	983 Moffat Blvd
Mountain Valley Express	Completed - Case Closed	1299 Vanderbilt Cir
Payless Shoe Store	Completed - Case Closed	1160 Yosemite Ave W
Pitts Property	Completed - Case Closed	203 Lincoln Ave S
Ponte's Car Wash Case #2	Completed - Case Closed	707 Yosemite Ave E
Ponte's Car Wash Case #1	Completed - Case Closed	707 Yosemite Ave E
Pony Express Courier	Completed - Case Closed	959 Moffat Blvd
Private Residence	Completed - Case Closed	Private Residence
Quick Stop #121	Completed - Case Closed	1196 Louise Ave W
Rino Gas (Diablo Gasoline)	Completed - Case Closed	1001 Yosemite Ave E
Royal Oaks S&L	Completed - Case Closed	510 Main St N
Samuel Farrow	Completed - Case Closed	440 Main St N
San Joaquin Delta College Farm	Completed - Case Closed	5298 Brunswick Rd
Shell SS	Completed - Case Closed	1071 Main St N
Southland 7-11 #19976	Completed - Case Closed	1399 Main St N
Super Stop Market	Completed - Case Closed	290 Main St N
Ted Peters Trucking	Completed - Case Closed	1985 Yosemite Ave W
Tuff Boy Trailers	Completed - Case Closed	5151 Almondwood Dr
Union #5417	Completed - Case Closed	1700 Yosemite Ave E
Western Stone Products	Completed - Case Closed	1945 Lathrop Rd E

*SOURCE: CALIFORNIA WATER RESOURCES CONTROL BOARD GEOTRACKER DATABASE, 2016.*

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### *PERMITTED UNDERGROUND STORAGE TANK (UST)*

There are 14 locations with a Manteca address that have Underground Storage Tanks (UST) that are permitted through the California Water Resources Control Board. Table 4.1-3 lists the location of the 14 permitted underground storage tanks in Manteca.

**TABLE 4.1-3: MANTECA PERMITTED UST SITES**

<i>NAME</i>	<i>LOCATION</i>
Arco Product Co #6313	1100 Main St
Boyett Petroleum	419 Main St
Cal Central Farm Service	12776 French Camp Rd
Chevron USA #201761	1103 Main St
Doctors Hospital Of Manteca	1205 North St
Jackpot Food Mart	1434 Yosemite Ave
Machado & Machado Dairy	26234 Union Rd
Machado Bros Dairy 39-338	12700 Louise Ave
Manteca Liquor & Food	890 Main St
One Stop Market	1151 Louise Ave
Quik Stop #124	505 Main St
Raymond Dowell	8330 Southland Rd
Shinko Electric America Inc	551 Carnegie St
St Dominic's Hospital/Manteca	1777 Yosemite Ave

SOURCE: CALIFORNIA WATER RESOURCES CONTROL BOARD GEOTRACKER DATABASE, 2016.

### *WATER BOARD PROGRAM CLEANUP SITES*

There are 12 locations with a Manteca address that are listed in the GeoTracker database for Water Board Cleanup Sites. Three of the locations have undergone cleanup and the State has closed the case. There are nine locations in Manteca with an open case. Table 4.1-4 lists the location of open and closed cases for Water Board Program Cleanup Sites in Manteca.

**TABLE 4.1-4: MANTECA WATER BOARD CLEANUP SITES**

<i>NAME</i>	<i>LOCATION</i>
<i>OPEN - REMEDIATION</i>	
Former Suprema Cheese Wastewater Pond	N. Of Lathrop Rd. And E. Of Airport Rd.
Ted Peters Trucking Mantic Facility	1985 W Yosemite Ave
<i>OPEN - INACTIVE CASE</i>	
99 Auto Recycling (De Rose Property)	430 Moffat Blvd.
Balmat & Co	Sedan Avenue
Ditz Brothers Incorporated	575 Industrial Park Drive
Former French Cleaners	416 West Yosemite Avenue
ISF Labs Incorporated	400-560 Industrial Park Drive
Tri-Ag Service	20696 S. Manteca Road
United Agri Products	301 Wetmore St
<i>CLOSED CASES (CLEANUP COMPLETED)</i>	
Karlson Trucking	9909 East Woodward Ave
PG&E Transformer Release	2978 W. Yosemite Ave.
Sterling Transit	410 S. Main Street

SOURCE: CALIFORNIA WATER RESOURCES CONTROL BOARD GEOTRACKER DATABASE, 2016.

*WATER BOARD CEASE AND DESIST ORDERS*

On March 19, 2004, the Regional Water Quality Control Board, Central Valley Region, adopted Waste Discharge Requirements Order No. R5-2004-0028, (Order) NPDES No. CA0081558, prescribing waste discharge requirements for the City of Manteca Wastewater Quality Control Facility. Cease and Desist Order No. R5-2004-0029 (CDO) was also issued, which includes requirements and time schedules to bring the discharge into full compliance with the final effluent and receiving water limitations contained in the Order.

On March 29, 2005, the Executive Officer issued Administrative Civil Liability (ACL) Complaint No. R5-2005-0509 (Complaint) to the City of Manteca to assess mandatory penalties for effluent limitation violations, pursuant to California Water Code Section 13385(h) and (i), and for noncompliance with several time schedules required in the Order and CDO. Following settlement negotiations, on 16 September 2005, the Regional Water Board issued ACL Order No. R5-2005-0128 for \$463,000, including a supplemental environmental project. In accordance with the settlement discussions, the Discharger provided an updated schedule for meeting the compliance time schedule for thermal limitations, and requested an extension of an interim compliance date to submit a Thermal Plan Exception Report.

**Solid Waste Information System (SWIS)***FACILITY/SITE LISTING*

The Solid Waste Information System (SWIS) is a database of solid waste facilities that is maintained by the California Integrated Waste Management Board (CIWMB). The SWIS data identifies active, planned and closed sites. The City of Manteca has seven solid waste facilities listed in the database, four of which are active. The site details are listed in Table 4.1-5 below.

**TABLE 4.1-5: CIWMB FACILITIES/SITES**

<i>NUMBER</i>	<i>NAME</i>	<i>ACTIVITY</i>	<i>REGULATORY</i>	<i>STATUS</i>
39-AA-0008	Lovelace Transfer Station	Large Volume Transfer/Proc Facility	Permitted	Active
39-AA-0015	Forward Landfill, Inc.	Solid Waste Landfill	Permitted	Active
39-AA-0020	Forward Resource Recovery Facility	Large Volume Transfer/Proc Facility	Permitted	Active
39-AA-0037	Delicato Vineyards	Composting Operation (Ag)	Permitted	Active
39-CR-0024	Manteca City Dump	Solid Waste Disposal Site	Pre-regulations	Closed
39-CR-0025	Manteca County Dump	Solid Waste Disposal Site	Pre-regulations	Closed
39-CR-0032	Spic And Span Private Garbage Dump	Solid Waste Disposal Site	Pre-regulations	Closed

*SOURCE: CALIFORNIA DEPARTMENT OF RESOURCES RECYCLING AND RECOVERY, 2016.*

The Lovelace Transfer Station is located at 2323 Lovelace Road. The facility is owned by the County of San Joaquin, is administered by the Public Works Department, and is inspected numerous times each year. The most recent inspection of this facility (as of 7/2016) by the Local Enforcement Agency (San Joaquin County Health Services Department Environmental Health Division) shows one area of concern and no violations. The area of concern pertained to truck drivers failing to wearing safety equipment. No other areas of concern or violations have been noted at this facility.

The Forward Landfill is located at 9999 S. Austin Road. The facility is owned by Forward Inc./Allied Waste North America and is inspected numerous times each year. The most recent inspections of this facility (as of 7/2016) by the Local Enforcement Agency (San Joaquin County Health Services Department Environmental Health Division) shows eleven areas of concern and one violation. The violation pertained

to exposed waste from the previous day. The areas of concern pertained to litter accumulation, daily cover, drainage and erosion control, lighting, and grading of fill surfaces.

The Forward Resources Recovery Facility is located at 9999 N. Austin Road. The facility is owned by Forward Inc./Allied Waste North America and is inspected numerous times each year. The most recent inspections of this facility (as of 7/2016) by the Local Enforcement Agency (San Joaquin County Health Services Department Environmental Health Division) show no violations or areas of concern.

The Delicato Vineyards composting operation is located at 12001 S. Highway 99. The facility is owned by Delicato Vineyards, and is inspected numerous times each year. The most recent inspections of this facility (as of 7/2016) by the Local Enforcement Agency (San Joaquin County Health Services Department Environmental Health Division) show no violations or areas of concern.

### REFERENCES

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<http://www.calrecycle.ca.gov/SWFacilities/Directory/Search.aspx>.

California Department of Toxic Substances Control. 2016. Envirostor Database.

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City of Manteca. Adopted October 6, 2003. City of Manteca General Plan 2023.

## 4.2 AIR TRAFFIC

The State Division of Aeronautics has compiled extensive data regarding aircraft accidents around airports in California. This data is much more detailed and specific than data currently available from the FAA and the National Transportation Safety Board (NTSB). According to the California Airport Land Use Planning Handbook (2002), prepared by the State Division of Aeronautics, 18.2% of general aviation accidents occur during takeoff and initial climb and 44.2% of general aviation accidents occur during approach and landing. The State Division of Aeronautics has plotted accidents during these phases at airports across the country and has determined certain theoretical areas of high accident probability.

### Approach and Landing Accidents

As nearly half of all general aviation accidents occur in the approach and landing phases of flight, considerable work has been done to determine the approximate probability of such accidents. Nearly 77% of accidents during this phase of flight occur during touchdown onto the runway or during the roll-out. These accidents typically consist of hard or long landings, ground loops (where the aircraft spins out on the ground), departures from the runway surface, etc. These types of accidents are rarely fatal and often do not involve other aircraft or structures. Commonly these accidents occur due to loss of control on the part of the pilot and, to some extent, weather conditions. (California Division of Aeronautics, 2002).

The remaining 23% of accidents during the approach and landing phase of flight occur as the aircraft is maneuvered towards the runway for landing, in a portion of the airspace around the airport commonly called the traffic pattern. Common causes of approach accidents include the pilot's misjudging of the rate of descent, poor visibility, unexpected downdrafts, or tall objects beneath the final approach course. Improper use of rudder on an aircraft during the last turn toward the runway can sometimes result in a stall (a cross-control stall) and resultant spin, causing the aircraft to strike the ground directly below the aircraft. The types of events that lead to approach accidents tend to place the accident site fairly close to the extended runway centerline. The probability of accidents increases as the flight path nears the approach end of the runway. (California Division of Aeronautics, 2002).

According to aircraft accident plotting provided by the State Division of Aeronautics, most accidents that occur during the approach and landing phase of flight occur on the airport surface itself. The remainder of accidents that occur during this phase of flight are generally clustered along the extended centerline of the runway, where the aircraft is flying closest to the ground and with the lowest airspeed. (California Division of Aeronautics, 2002).

### Takeoff and Departure Accidents

According to data collected by the State Division of Aeronautics, nearly 65% of all accidents during the takeoff and departure phase of flight occur during the initial climb phase, immediately after takeoff. This data is correlated by two physical constraints of general aviation aircraft:

- The takeoff and initial climb phase are times when the aircraft engine(s) is under maximum stress and is thus more susceptible to mechanical problems than at other phases of flight; and
- Average general aviation runways are not typically long enough to allow an aircraft that experiences a loss of power shortly after takeoff to land again and stop before the end of the runway.

While the majority of approach and landing accidents occur on or near to the centerline of the runway, accidents that occur during initial climb are more dispersed in their location as pilots are not attempting

to get to any one specific point (such as a runway). Additionally, aircraft vary widely in payload, engine power, glide ratio, and several other factors that affect glide distance, handling characteristics after engine loss, and general response to engine failure. This further disperses the accident pattern. However, while the pattern is more dispersed than that seen for approach and landing accidents, the departure pattern is still generally localized in the direction of departure and within proximity of the centerline. This is partially due to the fact that pilots are trained to fly straight ahead and avoid turns when experiencing a loss of power or engine failure. Turning flight causes the aircraft to sink faster and flying straight allows for more time to attempt to fix the problem. (California Division of Aeronautics, 2002).

### REGULATORY FRAMEWORK

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#### *FEDERAL*

##### **Aviation Act of 1958**

The Federal Aviation Act resulted in the creation of the Federal Aviation Administration (FAA). The FAA was charged with the creation and maintenance of a National Airspace System.

##### **Federal Aviation Regulations (CFR, Title 14)**

The Federal Aviation Regulations (FAR) establish regulations related to aircraft, aeronautics, and inspections and permitting.

#### *STATE*

##### **Aeronautics Act (Public Utilities Code §21001)**

The Caltrans Division of Aeronautics bases the majority of its aviation policies on the Aeronautics Act. Policies include permits and annual inspections for public airports and hospital heliports and recommendations for schools proposed within two miles of airport runways.

##### **Airport Land Use Commission Law (Public Utilities Code §21670 et seq.)**

The law, passed in 1967, authorized the creation of Airport Land Use Commissions (ALUC) in California. Per the Public Utilities Code, the purpose of an ALUC is to protect *public health, safety, and welfare by encouraging orderly expansion of airports and the adoption of land use measures that minimizes exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses* (§21670). Furthermore, each ALUC must prepare an Airport Land Use Compatibility Plan (ALUCP). Each ALUCP, which must be based on a twenty-year planning horizon, should focus on broadly defined noise and safety impacts.

### ENVIRONMENTAL SETTING

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#### **Local Airport Facilities**

There are no private or public airport facilities in the Planning Area.

**Stockton Metropolitan Airport:** The Stockton Metropolitan Airport is located approximately 3.5 miles north of the Manteca City limits. This airport is a County-owned facility that occupies approximately 1,609 acres at an elevation of 23 feet above Mean Sea Level (MSL). The acreage within Airport Influence Area is 56,184 acres.

The Stockton Metropolitan Airport is designated as a Non-hub Commercial Service Airport within the Federal Aviation Administration's (FAA) National Plan of Integrated Airport Systems (NPIAS). The airport

is served by Allegiant Air, which provides service to Phoenix/Mesa, Arizona and Las Vegas, Nevada. In addition to commercial service, Stockton Metropolitan Airport offers a wide range of fixed base operators (FBOs) providing fuel, aircraft maintenance, aircraft hangar and tie-down rental, aircraft rental, flight training, aircraft management services, and pilot lounges for corporate and general aviation pilots. The airport also houses FBOs that support air cargo operations.

Stockton Metropolitan Airport is served by a parallel runway system in a northwest-southeast orientation. Runway 11L-29R is 10,650 feet long and 150 feet wide and is constructed of asphalt. Runway 11R-29L is 4,448 feet long and 75 feet wide and also constructed of asphalt. Runway 11L-29R is accommodated by several instrument approach procedures aiding pilots in navigation to the runway. Runway 29R contains a medium intensity approach lighting system with runway alignment lights (MALSR) to provide runway alignment guidance for pilots in reduced visibility conditions. Runway 11L-29R is served by a four-light Precision Approach Path Indicator (PAPI- 4) at both ends and contains high intensity runway lighting (HIRL) to indicate the location of the runway edge. Runway 11R-29L does not contain approach or runway edge lighting.

The northernmost portion of the Planning Area is located within the airport influence area for the Stockton Metropolitan Airport identified in the ALUCP. The majority of this land within the airport influence area is zoned for agricultural uses by the City's General Plan 2023. Other land uses within the airport influence area include park, industrial, commercial, public, low density residential, and medium density residential.

The lands within the City limits that are located in the airport influence area for the Stockton Metropolitan Airport are not within the Airport's noise exposure contours. However, the lands within the City that are located in the airport influence area are within two of the Airport's Safety Zones: Traffic Pattern Zone 7b and Zone 8. Lands within Traffic Pattern Zone 7b cannot be developed with non-residential intensities greater than 450 persons per acre and must have open land over 10% of the site. Additionally, uses within Traffic Pattern Zone 7b cannot be hazardous to flight, and outdoor stadiums are prohibited. Non-residential development on land within Traffic Pattern Zone 8 is not subject to a maximum intensity or open space requirement. Airspace review is required for development greater than 100 feet tall on lands within Zone 7b or Zone 8. Similarly, new dumps or landfills within Zone 7b or Zone 8 are subject to the FAA notification and review and are further subject to restrictions and conditions outlined by the FAA.

### Major Regional Airport Facilities

**San Francisco International Airport (SFO):** SFO is the largest airport in the region, and a hub for United Airlines. It provides a wide range of domestic airline service and all of the region's long-haul international flights. San Francisco serves 68% of regional Bay Area air passengers and 43% of regional air cargo shipments.

**Metropolitan Oakland International Airport (OAK):** Oakland Airport has traditionally been the hub for low cost carriers and a major air cargo center due to operations by FedEx and UPS. Oakland serves 17% of Bay Area regional air passengers and 52% of air cargo.

**Norman Y. Mineta San Jose International Airport (SJC):** Traffic at San Jose Airport has been affected by the recent realignment of airline services in the Bay Area. The airport does not currently offer any long-haul international flights, and air cargo facilities are limited due to space constraints. San Jose serves 15% of the Bay Area regional air passengers and 6% of air cargo.

**Sacramento International Airport (SMF):** The Sacramento Airport served nearly 9 million passengers in 2012 with 150 daily departures to 36 destinations. Southwest provides the majority of flights. Many Sacramento area air passengers use Oakland and San Francisco for their air service needs. Conversely, some Bay Area passengers choose Sacramento Airport.

### **National Transportation Safety Board Aviation Accident Database**

The National Transportation Safety Board Aviation Accident Database does not identify any aircraft accidents with Manteca identified as the nearest location between January of 1983 to 2017. (National Transportation Safety Board, 2017).

### **REFERENCES**

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### 4.3 FIRE HAZARDS

This section addresses the hazards associated with wildfires in the Planning Area. The discussion of fire suppression resources is located in the Community Services and Facilities section of this report.

#### REGULATORY SETTING

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##### *FEDERAL*

##### **FY 2001 Appropriations Act**

Title IV of the Appropriations Act required the identification of “Urban Wildland Interface Communities in the Vicinity of Federal Lands that are at High Risk from Wildfire” by the U.S. Departments of the Interior and Agriculture.

##### *STATE*

##### **California Government Code Section 65302**

This section, which establishes standards for developing and updating General Plans, includes fire hazard assessment and Safety Element content requirements.

##### **Assembly Bill 337**

Per AB 337, local fire prevention authorities and the California Department of Forestry and Fire Protection (CalFire) are required to identify “Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Areas (LRA). Standards related to brush clearance and the use of fire resistant materials in fire hazard severity zones are also established.

##### **California Public Resources Code**

The State’s Fire Safe Regulations are set forth in Public Resources Code §4290, which include the establishment of State Responsibility Areas (SRA).

Public Resources Code §4291 sets forth defensible space requirements, which are applicable to anyone that *...owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material (§4291(a)).*

##### **Uniform Fire Code**

The Uniform Fire Code (UFC) establishes standards related to the design, construction, and maintenance of buildings. The standards set forth in the UFC range from designing for access by firefighters and equipment and minimum requirements for automatic sprinklers and fire hydrants to the appropriate storage and use of combustible materials.

##### **CA Code of Regulations Title 8**

In accordance with CCR, Title 8, §1270 and §6773 (*Fire Prevention and Fire Protection and Fire Equipment*), the Occupational Safety and Health Administration (Cal OSHA) establishes fire suppression service standards. The standards range from fire hose size requirements to the design of emergency access roads.

##### **CA Code of Regulations Title 14 (Natural Resources)**

Division 1.5 (Department of Forestry and Fire Protection), Title 14 of the CCR establishes a variety of wildfire preparedness, prevention, and response regulations.

### **CA Code of Regulations Title 19 (Public Safety)**

Title 19 of the CCR establishes a variety of emergency fire response, fire prevention, and construction and construction materials standards.

### **CA Code of Regulations Title 24 (CA Building Standards Code)**

The California Fire Code is set forth in Part 9 of the Building Standards Code. The CA Fire Code, which is pre-assembled with the International Fire Code by the ICC, contains fire-safety building standards referenced in other parts of Title 24.

### **CA Health and Safety Code and UBC Section 13000 et seq.**

State fire regulations are set forth in §13000 *et seq.* of the California Health and Safety Code, which is divided into “Fires and Fire Protection” and “Buildings Used by the Public.” The regulations provide for the enforcement of the UBC and mandate the abatement of fire hazards.

The code establishes broadly applicable regulations, such as standards for buildings and fire protection devices, in addition to regulations for specific land uses, such as childcare facilities and high-rise structures.

### **CA Health and Safety Code Division 11 (Explosives)**

Division 11 of the Health and Safety Code establishes regulations related to a variety of explosive substances and devices, including high explosives and fireworks. Section 12000 *et seq.* establishes regulations related to explosives and explosive devices, including permitting, handling, storage, and transport (in quantities greater than 1,000 pounds).

### **CA Health and Safety Code Division 12.5 (Buildings Used by the Public)**

This Division establishes requirements for buildings used by the public, including essential services buildings, earthquake hazard mitigation technologies, school buildings, and postsecondary buildings.

### **CA Vehicle Code §31600 (Transportation of Explosives)**

Establishes requirements related to the transportation of explosives in quantities greater than 1,000 pounds, including licensing and route identification.

#### *LOCAL*

### **City of Manteca General Plan**

The existing City of Manteca General Plan identifies the following goals, policies, and implementation measures related to fire:

#### **Safety Element**

**GOAL S-1: Prevent loss of lives, injury, and property damage due to geological hazards and seismic activity.**

**GOAL S-5: The City shall protect the health, safety, natural resources, and property through regulation of use, storage, transport, and disposal of hazardous materials.**

**GOAL S-6: Ensure that City emergency procedures are adequate in the event of potential natural or man-made disasters.**

**POLICY S-P-6:** The City shall comply with the California State seismic and building standards in the design and siting of critical facilities, including police and fire stations, school facilities, hospitals, hazardous materials manufacturing and storage facilities, and large public assembly halls.

IMPLEMENTATION S-I-10: The City shall require the submittal of lists of hazardous materials used in existing and proposed industrial and commercial businesses within the City of Manteca. The list shall be maintained through the Manteca Fire Department and updated through periodic review.

### ***Public Facilities and Services Element***

**POLICY PF-P-42:** The City shall endeavor to maintain an overall fire insurance (ISO) rating of 4 or better.

**POLICY PF-P-43:** The City shall endeavor through adequate staffing and station locations to maintain the minimum feasible response time for fire and emergency calls.

**POLICY PF-P-44:** The City shall provide fire services to serve the existing and projected population.

**POLICY PF-P-45:** The City will establish the criteria for determining the circumstances under which fire service will be enhanced.

IMPLEMENTATION PF-I-24: The Fire Department shall continuously monitor response times and report annually on the results of the monitoring.

IMPLEMENTATION PF-I-25: The Planning Commission and City Engineer will review proposed residential street patterns to evaluate the accessibility for fire engines and emergency response.

## IDENTIFYING FIRE HAZARDS

### **Fuel Rank**

Fuel rank is a ranking system developed by CalFire that incorporates four wildfire factors: fuel model, slope, ladder index, and crown index.

The U.S. Forest Service has developed a series of fuel models, which categorize fuels based on burn characteristics. These fuel models help predict fire behavior. In addition to fuel characteristics, slope is an important contributor to fire hazard levels. A surface ranking system has been developed by CalFire, which incorporates the applicable fuel models and slope data. The model categorizes slope into six ranges: 0-10%, 11-25%, 26-40%, 41-55%, 56-75% and >75%. The combined fuel model and slope data are organized into three categories, referred to as surface rank. Thus, surface rank is a reflection of the quantity and burn characteristics of the fuels and the topography in a given area.

The ladder index is a reflection of the distance from the ground to the lowest leafy vegetation for tree and plant species. The crown index is a reflection of the quantity of leafy vegetation present within individual specimens of a given species.

The surface rank, ladder index, and crown index for a given area are combined in order to establish a fuel rank of medium, high, or very high. Fuel rank is used by CalFire to identify areas in the California Fire Plan where large, catastrophic fires are most likely.

The City of Manteca contains areas with “moderate” and “non-wildland fuel” ranks. The areas warranting “moderate” fuel ranks possess combustible material in sufficient quantities combined with

topographic characteristics that pose a wildfire risk. CalFire data for the areas immediately surrounding the Planning Area also include “moderate” and “non-wildland fuel” ranks. Areas west of Interstate 5, approximately 15 miles or further southwest of the Planning Area, are designated as “moderate” and “high” fuel ranks.

### **Fire Threat**

The fuel rank data are used by CalFire to delineate fire threat based on a system of ordinal ranking. Thus, the Fire Threat model creates discrete regions, which reflect fire probability and predicted fire behavior. The four classes of fire threat range from moderate to extreme.

### **FIRE HAZARD SEVERITY ZONES**

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The state has charged CalFire with the identification of Fire Hazard Severity Zones (FHSZ) within State Responsibility Areas. In addition, CalFire must recommend Very High Fire Hazard Severity Zones (VHFHSZ) identified within any Local Responsibility Areas. The FHSZ maps are used by the State Fire Marshall as a basis for the adoption of applicable building code standards.

### **Local Responsibility Areas**

The majority of the Planning Area is not located within a Local Responsibility Area (LRA). Three portions of the Planning Area are located in an LRA: a developed area near Airport Way and W. Yosemite Avenue, a developed area near E. Yosemite Avenue and Austin Road, and a developed area near W. Louise Avenue and S. Airport Way. Manteca is an LRA that is served by the Manteca Fire Department. The Manteca Fire Department serves approximately 71,164 residents throughout approximately 17.2 square miles within the City limits. The City of Manteca is not categorized as a "Very High" FHSZ by CalFire. No cities or communities within San Joaquin County are categorized as a "Very High" FHSZ by CalFire.

### **State Responsibility Areas**

There are no State Responsibility Areas (SRAs) within the vicinity of the Planning Area.

### **Federal Responsibility Areas**

There are no Federal Responsibility Areas (FRAs) within the vicinity of the Planning Area.

### **REFERENCES**

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## 4.4 FLOODING

This section addresses the hazards associated with flooding in the Planning Area. The discussion of storm drainage infrastructure is located in the Community Services and Facilities section of this report.

### REGULATORY FRAMEWORK

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#### FEDERAL

#### **Federal Emergency Management Agency (FEMA)**

FEMA operates the National Flood Insurance Program (NFIP). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. Communities are occasionally audited by the California Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

#### **Rivers and Harbors Appropriation Act of 1899**

One of the country's first environmental laws, this Act established a regulatory program to address activities that could affect navigation in Waters of the United States.

#### **Water Pollution Control Act of 1972**

The Water Pollution Control Act (WPCA) established a program to regulate activities that result in the discharge of pollutants to waters of the United States

#### **Clean Water Act of 1977**

The CWA, which amended the WPCA of 1972, sets forth the §404 program to regulate the discharge of dredged and fill material into Waters of the U.S. and the §402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the U.S. The §401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of Federal permits and approvals (including CWA §404, CWA §402, FERC Hydropower and §10 Rivers and Harbors).

#### **Flood Control Act**

The Flood Control Act (1917) established survey and cost estimate requirements for flood hazards in the Sacramento Valley. All levees and structures constructed per the Act were to be maintained locally but controlled federally. All rights of way necessary for the construction of flood control infrastructure were to be provided to the Federal government at no cost.

Federal involvement in the construction of flood control infrastructure, primarily dams and levees, became more pronounced upon passage of the Flood Control Act of 1936.

#### **National Flood Insurance Program (NFIP)**

Per the National Flood Insurance Act of 1968, the NFIP has three fundamental purposes: *Better indemnify individuals for flood losses through insurance; Reduce future flood damages through State and community floodplain management regulations; and Reduce Federal expenditures for disaster assistance and flood control.*

While the Act provided for subsidized flood insurance for existing structures, the provision of flood insurance by FEMA became contingent on the adoption of floodplain regulations at the local level.

### **Flood Disaster Protection Act (FDPA)**

The FDPA of 1973 was a response to the shortcomings of the NFIP, which were experienced during the flood season of 1972. The FDPA prohibited Federal assistance, including acquisition, construction, and financial assistance, within delineated floodplains in non-participating NFIP communities. Furthermore, all Federal agencies and/or federally insured and federally regulated lenders must require flood insurance for all acquisitions or developments in designated Special Flood Hazard Areas (SFHAs) in communities that participate in the NFIP.

Improvements, construction, and developments within SFHAs are generally subject to the following standards:

- All new construction and substantial improvements of residential buildings must have the lowest floor (including basement) elevated to or above the base flood elevation (BFE).
- All new construction and substantial improvements of non-residential buildings must either have the lowest floor (including basement) elevated to or above the BFE or dry-floodproofed to the BFE.
- Buildings can be elevated to or above the BFE using fill, or they can be elevated on extended foundation walls or other enclosure walls, on piles, or on columns.
- Extended foundation or other enclosure walls must be designed and constructed to withstand hydrostatic pressure and be constructed with flood-resistant materials and contain openings that will permit the automatic entry and exit of floodwaters. Any enclosed area below the BFE can only be used for the parking of vehicles, building access, or storage.

### *STATE*

#### **Assembly Bill 162**

This bill requires a general plan's land use element to identify and annually review those areas covered by the general plan that are subject to flooding as identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources (DWR). The bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the conservation element of the general plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management. By imposing new duties on local public officials, the bill creates a State-mandated local program.

This bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the safety element to identify, among other things, information regarding flood hazards and to establish a set of comprehensive goals, policies, and objectives, based on specified information for the protection of the community from, among other things, the unreasonable risks of flooding.

#### **Assembly Bill 70**

This bill provides that a city or county may be required to contribute its fair and reasonable share of the property damage caused by a flood to the extent that it has increased the State's exposure to liability for property damage by unreasonably approving, as defined, new development in a previously undeveloped

area, as defined, that is protected by a State flood control project, unless the city or county meets specified requirements.

### **CA Government Code**

The Senate and Assembly bills identified above have resulted in various changes and additions to the California Government Code. Key sections related to the above referenced bills are identified below.

#### Section 65302

Revised safety elements must include maps of any 200-year flood plains and levee protection zones within the Planning Area.

#### Section 65584.04

Any land having inadequate flood protection, as determined by FEMA or DWR, must be excluded from land identified as suitable for urban development within the planning area.

#### Section 8589.4

California Government Code §8589.4, commonly referred to as the Potential Flooding-Dam Inundation Act, requires owners of dams to prepare maps showing potential inundation areas in the event of dam failure. A dam failure inundation zone is different from a flood hazard zone under the National Flood Insurance Program (NFIP). NFIP flood zones are areas along streams or coasts where storm flooding is possible from a “100-year flood.” In contrast, a dam failure inundation zone is the area downstream from a dam that could be flooded in the event of dam failure due to an earthquake or other catastrophe. Dam failure inundation maps are reviewed and approved by the California Office of Emergency Services (OES). Sellers of real estate within inundation zones are required to disclose this information to prospective buyers.

### *LOCAL*

### **City of Manteca General Plan**

The existing City of Manteca General Plan identifies the following goals, policies, and implementation measures related to flooding:

#### **Safety Element**

**GOAL S-3: Protect life and property from flood events.**

**GOAL S-4: Provide a planning framework suitable for flood protection and risk management consistent with Federal and State law.**

**GOAL S-5: Pursue flood control solutions that minimize environmental impacts.**

**POLICY S-P-7:** Periodically review and update when necessary, the General Plan Safety Element goals, policies, and implementation measures in order to maintain compliance with applicable Federal and State requirements.

**POLICY S-P-8:** Maintain and periodically update, City flood safety plans, floodplain management ordinances, zoning ordinance, building codes and other related sections of the Manteca Municipal Code to reflect Safety Element goals, policies and standards, applicable Federal and State law, and National Flood Insurance Program requirement.

**POLICY S-P-9:** The City shall require evaluation of potential flood hazards prior to approval of development projects to determine whether the proposed development is reasonably safe from flooding and consistent with California Department of Water Resources (DWR) Urban Level of Flood Protection Criteria. The City shall not approve the execution of a development agreement, a tentative map, or a parcel map for which a tentative map is not required, or a discretionary permit or other discretionary entitlement that would result in the construction of a new building, or construction that would result in an increase in allowed occupancy for an existing building, or issuance of a ministerial permit that would result in the construction of a new residence for property that is located within a 200-year flood hazard zone, unless the adequacy of flood protection as described in Government Code §65865.5(a), 65962(a), or 66474.5(a), has been demonstrated.

**POLICY S-P-10:** The City may permit new development in areas not identified as “urban” or “urbanizing” provided that they are protected from 100-year flooding by FEMA-accredited levees or equivalent flood protection as shown on an adopted FEMA FIRM, a FEMA-approved Letter of Map Revision (LOMR) or a Conditional Letter of Map Revision (CLOMR), subject to conditions specified in the CLOMR.

**POLICY S-P-11:** The City may permit new development in areas not protected by FEMA-accredited 100-year levees subject to all applicable requirements of Manteca Municipal Code Chapter 8.30 (Floodplain Management), the California Building Standards Code as adopted by the City, and the latest promulgated FEMA standards for development in the 100-year floodplain, provided that new development approval will not cause the project site or area to be defined as “urban” or “urbanizing.”

**POLICY S-P-12:** Work closely with the City of Lathrop, and the local reclamation districts to improve levee systems as required to provide ULOP for urban and urbanizing areas in Manteca by 2025, and to provide the basis for findings of “adequate progress” toward that objective based on substantial evidence as soon as possible.

**POLICY S-P-13:** The City shall continue to cooperate with local, regional, State, and Federal agencies in securing funding to obtain the maximum level of flood protection that is practical, with a goal of achieving 200-year flood protection for all areas of the City.

**POLICY S-P-14:** Maintain active participation in the National Flood Insurance Program (NFIP).

**POLICY S-P-15:** The City shall maintain eligibility in the Federal Emergency Management Agency’s (FEMA’s) Community Rating System (CRS) program, which gives property owners discounts on flood insurance.

**POLICY S-P-16:** Provide technical assistance and encourage landowners within the FEMA Special Flood Hazard Area (100-year floodplain) to purchase and maintain flood insurance.

**POLICY S-P-17:** Ensure that the impacts of potential flooding are adequately analyzed when considering areas for future urban expansion.

**POLICY S-P-18:** Provide opportunities for review of and comment by the reclamation districts, Manteca Police Services, Manteca Fire Department, the Lathrop Manteca Fire District for comment during new development project review.



**POLICY S-P-19:** Consider the risks of catastrophic dam failure in the planning and environmental review of new development projects.

**POLICY S-P-20:** Incorporate riparian habitat protection, mitigation or enhancement into flood protection improvements to maintain existing floodwater capacity where feasible.

**POLICY S-P-21:** Combine flood control, recreation, water quality, and open space functions where feasible.

**POLICY S-P-22:** Discourage large continuous paved areas unless provided with engineered drainage facilities, and where feasible, require the use of pervious paving materials.

**POLICY S-P-23:** When improvements to existing developments are made costing at least 50 percent of the current market value of the structure before improvements, structures shall be brought into compliance with relevant FEMA standards.

**POLICY S-P-24:** The City shall require, for areas protected by levees, all new developments to include a notice within the deed that the property is protected from flooding by a levee and that the property can be subject to flooding if the levee fails or is overwhelmed by floodwater flow.

**POLICY S-P-25:** The City shall update flood hazard maps as necessary to reflect impacts from climate change in terms of long-term flood safety and long-term flood event probabilities.

**IMPLEMENTATION S-I-4:** The City will amend Title 17 (Zoning) of the Manteca Municipal Code so as to require that ULOP or “adequate progress” findings specified in the Safety Element, and in Government Code Sections 65007, 65865.5, 65962 and 66474.5, be made prior to approving a development project located within RD 17 with predicted 200-year flood depths of more than three feet according to the official map approved by the City of Manteca or Floodplain Administrator. Title 17 amendments shall also implement all Safety Element policies related to development permitting in potentially flooded areas.

**IMPLEMENTATION S-I-5:** The City will evaluate the consistency of the Safety Element with applicable laws, regulations and plans in conjunction with its annual review of the General Plan. The City shall determine whether and when an amendment of the Safety Element is required.

**IMPLEMENTATION S-I-6:** The City will continue to participate in the FEMA CRS program, including dissemination of information to the public and annual reviews of its participation in the FEMA CRS program and improve the program as feasible to maintain or improve effects on flood insurance costs.

**IMPLEMENTATION S-I-7:** The City will consider, in the review of plans for new development, the need for levee setbacks, dam failure risks and the views of the local flood protection and emergency response agencies.

**IMPLEMENTATION S-I-8:** Applications for development in areas subject to 200-year flooding shall indicate the depth of predicted 200-year flooding on the basis of official maps approved by the City of Manteca or Floodplain Administrator.

**IMPLEMENTATION S-I-9:** The City will monitor changes in Federal and State laws and regulations related to local flood protection, including the National Flood Insurance Program (NFIP) and

incorporate necessary changes into Section 15.56, Title 17 of the Manteca Municipal Code, the City's Emergency Operations Plan and building codes as required.

IMPLEMENTATION S-I-10: The City will prepare an official 200-year Floodplain Map for the City of Manteca identifying predicted flood depths for reference when making land use determinations.

IMPLEMENTATION S-I-11: The City will amend Chapter 8.30 (Floodplain Management) of the Manteca Municipal Code to reflect flood protection requirements specified in the Safety Element as well as any relevant updates to Federal or State requirements.

IMPLEMENTATION S-I-12: The City will consider potential effects of climate change in planning, design and maintenance of levee improvements and other flood control facilities.

IMPLEMENTATION S-I-13: City will coordinate with RD 17 and RD 2094 as required for the purpose of ensuring that ULOP is available as soon as possible and that "adequate progress" findings can be made.

IMPLEMENTATION S-I-14: The City will encourage the reclamation districts to incorporate riparian habitat protection and/or enhancement in levee improvement plans where feasible.

### ENVIRONMENTAL SETTING

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The City of Manteca is located 12 miles south of downtown Stockton, 14 miles northwest of Modesto, and 75 miles southeast of San Francisco. The Manteca Planning Area is situated in the south central portion of San Joaquin County. Although Manteca is one of the smaller planning areas within the County geographically, Manteca is the third most populated planning area in the County. The San Joaquin River and the Stanislaus River border the southwest and southern edge of the Planning Area, respectively.

Manteca is located in northern San Joaquin Valley. The San Joaquin Valley is the southern section of the Great Central Valley of California; the Sacramento Valley is the northern section. The Great Central Valley is a sedimentary basin, with the Coast Range to the west and the Sierra Nevada to the east. Almost all of the sediments that fill the Great Central Valley eroded from the Sierra Nevada. The oldest of these sediments are full of fragments of volcanic rocks eroded from its early volcanoes. As erosion stripped the cover of volcanic rocks from the granites of the Sierra Nevada, their detritus of pale quartz and feldspar sand began to wash into the Great Central Valley. Drainage into the San Joaquin Valley is mainly from the Sierra Nevada. The sediments on the valley floor were deposited within the past one-two million years, some within the past few thousand years.

Generally, slopes are nearly level across the Planning Area. The elevation ranges from approximately 10 to 50 feet above sea level, gently rising from the San Joaquin River on the west toward the east and the Sierra Nevada.

#### **Climate**

Summers in the Planning Area are warm and dry ranging from an average high in July of 93°F to an average low of approximately 59°F. Winters are cool and mild, with an average high of 53°F and a low of 37°F in January. 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.

### FEMA Flood Zones

FEMA mapping provides important guidance for the City in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). The FEMA FIRM for the Planning Area is shown on Figure 4.4-1.

Areas that are subject to flooding are indicated by a series of alphabetical symbols, indicating anticipated exposure to flood events:

- **Zone A:** Subject to 100-year flooding with no base flood elevation determined. Identified as an area that has a one percent chance of being flooded in any given year.
- **Zone AE:** Subject to 100-year flooding with base flood elevations determined.
- **Zone AH:** Subject to 100-year flooding with flood depths between one and three feet being areas of ponding with base flood elevations determined.
- **500-year Flood Zone:** Subject to 500-year flooding. Identified as an area that has a 0.2 percent chance of being flooded in a given year.

The Planning Area is subject to flooding problems along the natural creeks and drainages that traverse the area. The primary flood hazard is the San Joaquin River (four miles outside the Study Area) and its tributaries, notably Walthall Slough (contiguous with the southwestern Study Area boundary). A levee running from Williamson Road east to Airport Way provides flood protection for the land north and east of Walthall Slough. This levee is under the jurisdiction of Reclamation District No. 17.

The 100-year flood plain is largely confined to the southwestern portion of the City limits and SOI. Similarly, the 500-year flood plain is located in the southwestern and western portions of the City limits and SOI.

### SB 5 Flood Zones

Both State policy and recently enacted State legislation (Senate Bill 5) call for 200-year (0.5% annual chance) flood protection to be the minimum level of protection for urban and urbanizing areas in the Central Valley. Senate Bill 5 (SB5) requires that the 200-year protection be consistent with criteria used or developed by the Department of Water Resources. SB 5 requires all urban and urbanizing areas in the Sacramento and San Joaquin Valleys to achieve 200-year flood protection in order to approve development. The 200-year floodplain for the Planning Area, as mapped by the City of Manteca and San Joaquin County, is shown on Figure 4.4-2. As shown in the figure, the 200-year floodplain is located in the western portion of the City's SOI and City limits. Existing uses within the 200-year floodplain include mainly agricultural and rural-residential uses. Some more recently developed homes located south of SR 120 are also located within the 200-year floodplain.

The City's 2013 Public Facilities Implementation Plan (PFIP) Update notes several stormwater control improvements aimed to protect the City from flooding during storm events. The 2013 Storm Drain Master Plan evaluates drainage from the General Plan lands within the City's Primary Urban Service Area through build out. Five planning zones have been identified to define the capital improvements needed to serve future growth: Zones 30, 32, 34, 36 and 39. With the exception of drainage Zone 39, all drainage zones are located in the SSJID service area. For development within Zone 39, separate facilities

will be constructed to convey runoff to one regional pump station that will discharge to Walthall Slough. These facilities would be required as new development within Zone 39 occurs.

Additionally, as funds are available, the City will construct water level monitoring facilities in the various PFIP zones and in the French Camp Outlet Canal to monitor water elevations in real-time to prevent flooding caused by additional drainage flows. Each zone's proportionate share of the water level monitoring stations is included the various PFIP zone fees.

### **Dam Inundation**

Earthquakes centered close to a dam are typically the most likely cause of dam failure. Dam Inundation maps have been required in California since 1972, following the 1971 San Fernando Earthquake and near failure of the Lower Van Norman Dam. The Planning Area has the potential to be inundated by four dams: Tulloch Dam, San Luis Dam, New Exchequer Dam (Lake McClure), and New Melones Dam. The dam inundation area for each dam is shown in Figure 4.4-3. Each dam is briefly described below:

- The Tulloch Dam, owned and operated by the Oakdale and South San Joaquin Irrigation Districts (collectively known as the Tri-Dam Project), is a gravity dam located on the Stanislaus River in both Calaveras and Tuolumne Counties. This dam was built in 1958 at a height of 205 feet with a reservoir capacity of 68,400 acre-feet. The Tulloch Dam is a jurisdictional dam.
- The San Luis Dam (or B.F. Sisk Dam), jointly owned and operated by the Bureau of Reclamation and the State of California, is a zoned earthfill dam that provides supplemental irrigation water to land in western Merced, Fresno and Kings Counties, as well as generates power. This dam, located on San Luis Creek near Los Banos, was completed in 1967 at a height of 382 feet with a reservoir capacity of 2,041,000 acre-feet. The San Luis Dam is a non-jurisdictional dam.
- The New Exchequer Dam, owned and operated by the Merced Irrigation District, is utilized for irrigation, power production, and downstream flood control. This concrete gravity-arch dam is located on the Merced River in Mariposa County. New Melones Dam was completed in 1967 at a height of 490 feet and a storage capacity of 1,024,600 acre-feet. The New Exchequer Dam is a jurisdictional dam.
- The New Melones Dam, owned and operated by Bureau of Reclamation's Central Valley Project, is utilized for irrigation, power production, and downstream flood control. This earth and rockfill dam is located on the Stanislaus River in southern Mother Lode, off of Highway 49. New Melones Dam was completed in 1979 at a height of 625 feet and a storage capacity of 2,400,000 acre-feet. The New Melones Dam is a non-jurisdictional dam.

These dams do not have a history of failure; however, they are identified as having the potential to inundate habitable portions of the Planning Area in the unlikely event of dam failure. The dam owners/operators, Oakdale and South San Joaquin Irrigation Districts, the Bureau of Reclamation, and the State of California, are responsible for the management, monitoring, and improvements to these dams to reduce the risk of dam failure and inundation.

Portions of the 100-year floodplain would be subject to inundation in the event of dam failure. Although the likelihood is remote, the area subject to inundation within the Study Area is not specifically defined, but would generally coincide with the area delineated as the 100-year floodplain.

Despite the number of dams near San Joaquin County, the risk of dam failure inundating portions of the County is considered low, and the degree and nature of risk for each dam is unknown. Dam failure can occur under three general conditions: as a result of an earthquake, an isolated incident due to structural instability, or because of intense rain in excess of design capacity.

Section 8589.5 of the California Government Code requires local jurisdictions to adopt emergency procedures for the evacuation of populated inundation areas identified by dam owners. The local Office of Emergency Services has prepared a Dam Failure Plan. This plan includes a description of dams, direction of floodwaters, responsibilities of local jurisdictions, and evacuation plans.

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## 4.5 NOISE

This section provides a discussion of the regulatory setting and a general description of existing noise sources in the City of Manteca. The analysis in this section was prepared with assistance from j.c. brennan & associates, Inc.

### KEY TERMS

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<b>Acoustics</b>	The science of sound.
<b>Ambient Noise</b>	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
<b>Attenuation</b>	The reduction of noise.
<b>A-Weighting</b>	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
<b>CNEL</b>	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 p.m. - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
<b>Decibel or dB</b>	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.
<b>Frequency</b>	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
<b>Impulsive</b>	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
<b>L<sub>dn</sub></b>	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
<b>L<sub>eq</sub></b>	Equivalent or energy-averaged sound level.
<b>L<sub>max</sub></b>	The highest root-mean-square (RMS) sound level measured over a given period of time.
<b>L<sub>(n)</sub></b>	The sound level exceeded as a described percentile over a measurement period. For instance, an hourly L <sub>50</sub> is the sound level exceeded 50 percent of the time during the one-hour period.
<b>Loudness</b>	A subjective term for the sensation of the magnitude of sound.
<b>Noise</b>	Unwanted sound.
<b>SEL</b>	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event

### FUNDAMENTALS OF ACOUSTICS

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Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected, or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level ( $L_{eq}$ ), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The  $L_{eq}$  is the foundation of the composite noise descriptor,  $L_{dn}$ , and shows very good correlation with community response to noise.

The day/night average level ( $L_{dn}$ ) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because  $L_{dn}$  represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to  $L_{dn}$ , but includes a +3 dB penalty for evening noise. Table 4.5-1 lists several examples of the noise levels associated with common situations.

## 4.0 HAZARDS, SAFETY, AND NOISE

**TABLE 4.5-1: TYPICAL NOISE LEVELS**

<i>COMMON OUTDOOR ACTIVITIES</i>	<i>NOISE LEVEL (DBA)</i>	<i>COMMON INDOOR ACTIVITIES</i>
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL, NOVEMBER 2009.

### EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and



- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

## REGULATORY FRAMEWORK

### *FEDERAL*

#### **Federal Highway Administration (FHWA)**

The FHWA has developed noise abatement criteria that are used for Federally funded roadway projects or projects that require Federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772).

#### **Environmental Protection Agency (EPA)**

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an  $L_{eq}$  of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an  $L_{eq}$  of 55 dBA and interior levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA  $L_{dn}$  as the basic goal for residential environments. However, other Federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA  $L_{dn}$ , have generally agreed on the 65 dBA  $L_{dn}$  level as being appropriate for residential uses. At 65 dBA  $L_{dn}$  activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

The U.S. Department of Housing and Urban Development (HUD) was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Act (Public Law 89-117) “to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes.”

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA  $L_{dn}$  or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA  $L_{dn}$  but not exceeding 75 dBA  $L_{dn}$  - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA  $L_{dn}$  area and 10 dBA of attenuation in a 70 to 75 dBA  $L_{dn}$  area.

- Exceeding 75 dBA  $L_{dn}$  - an unacceptable zone in which projects would not, as a rule, be approved.

HUD's regulations do not include interior noise standards. Rather a goal of 45 dBA  $L_{dn}$  is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction techniques, any building will provide sufficient attenuation so that if the exterior level is 65 dBA  $L_{dn}$  or less, the interior level will be 45 dBA  $L_{dn}$  or less. Thus, structural attenuation is assumed at 20 dBA. However, HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

The Federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependent on work conditions and is addressed through a facility's or construction contractor's health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

### *STATE*

#### **California Department of Transportation (Caltrans)**

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 1998b). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

#### **Governor's Office of Planning and Research (OPR)**

OPR has developed guidelines for the preparation of general plans (Office of Planning and Research, 1998). The guidelines include land use compatibility guidelines for noise exposure.

### *LOCAL*

#### **Existing City Noise Thresholds**

The City of Manteca General Plan Noise Element establishes goals and policies, as well as criteria for evaluating the compatibility of individual land uses with respect to noise exposure.

#### **Noise Element:**

**GOAL N-1: Protect the residents of Manteca from the harmful and annoying effects of exposure to excessive noise.**

**GOAL N-2: Protect the quality of life in the community and the tourism economy from noise generated by incompatible land uses.**

**GOAL N-3: Ensure that the downtown core noise levels remain acceptable and compatible with commercial and higher density residential land uses.**

**GOAL N-4: Protect public health and welfare by eliminating existing noise problems where feasible, by establishing standards for acceptable indoor and outdoor noise, and by preventing significant increases in noise levels.**

**GOAL N-5: Incorporate noise considerations into land use planning decisions, and guide the location and design of transportation facilities to minimize the effects of noise on adjacent land uses.**

**Policy N-P-1:** Areas within Manteca exposed to existing or projected exterior noise levels from mobile noise sources exceeding the performance standards in Table 9-1 [Table 4.5-2] shall be designated as noise-impacted areas.

**TABLE 4.5-2: CITY OF MANTECA MAXIMUM ALLOWABLE NOISE EXPOSURE - MOBILE NOISE SOURCES**

LAND USE <sup>4</sup>	OUTDOOR ACTIVITY AREAS <sup>1</sup>	INTERIOR SPACES	
		L <sub>DN</sub> /CNEL, dB	L <sub>EQ</sub> , dB <sup>3</sup>
Residential	60 <sup>2</sup>	45	
Transient Lodging	60 <sup>2</sup>	45	
Hospitals, Nursing Homes	60 <sup>2</sup>	45	
Theatres, Auditoriums, Music Halls			35
Churches, Music Halls	60 <sup>2</sup>		40
Office Buildings	65		45
Schools, Libraries, Museums			45
Playgrounds, Neighborhood Parks	70		

<sup>1</sup> Outdoor activity areas for residential development are considered to be backyard patios or decks of single family dwellings, and the common areas where people generally congregate for multi-family developments. Outdoor activity areas for non-residential developments are considered to be those common areas where people generally congregate, including pedestrian plazas, seating areas, and outside lunch facilities. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.

<sup>2</sup> In areas where it is not possible to reduce exterior noise levels to 60 dB L<sub>dn</sub> or below using a practical application of the best noise-reduction technology, an exterior noise level of up to 65 L<sub>dn</sub> will be allowed.

<sup>3</sup> Determined for a typical worst-case hour during periods of use.

<sup>4</sup> Where a proposed use is not specifically listed on the table, the use shall comply with the noise exposure standards for the nearest similar use as determined by the City.

SOURCE: CITY OF MANTECA GENERAL PLAN NOISE ELEMENT 2023, TABLE 9-1.

**Policy N-P-2:** New development of residential or other noise-sensitive land uses will not be permitted in noise-impacted areas unless effective mitigation measures are incorporated into the project design to satisfy the performance standards in Table 9-1 [Table 4.5-1].

**Policy N-P-3:** The City may permit the development of new noise-sensitive uses only where the noise level due to fixed (non-transportation) noise sources satisfies the noise level standards of Table 9-2 [Table 4.5-3]. Noise mitigation may be required to meet Table 9-2 [Table 4.5-3] performance standards.

**TABLE 4.5-3: CITY OF MANTECA PERFORMANCE STANDARDS FOR STATIONARY NOISE SOURCES OR PROJECTS AFFECTED BY STATIONARY NOISE SOURCES<sup>1</sup>**

NOISE LEVEL DESCRIPTOR	DAYTIME (7 A.M. TO 10 P.M.)	NIGHTTIME (10 P.M. TO 7 A.M.)
Hourly L <sub>eq</sub> , dB	50	45
Maximum Level, dB	70	65

<sup>1</sup> Each of the noise levels specified above should be lowered by five (5) dB for simple noise tones, noises consisting primarily of speech or music, or recurring impulsive noises. Such noises are generally considered by residents to be particularly annoying and are a primary source of noise complaints.

<sup>2</sup> No standards have been included for interior noise levels. Standard construction practices should, with the exterior noise levels identified, result in acceptable interior noise levels.

SOURCE: CITY OF MANTECA GENERAL PLAN NOISE ELEMENT 2023, TABLE 9-2.

**Policy N-P-4:** The City shall require stationary noise sources proposed adjacent to noise sensitive uses to be mitigated so as to not exceed the noise level performance standards in Table 9-2 [Table 4.5-3].

**Policy N-P-5:** In accord with the Table 9-2 [Table 4.5-3] standards, the City shall regulate construction-related noise impacts on adjacent uses.

**Policy N-P-6:** Where the development of residential or other noise-sensitive land use is proposed for a noise-impacted area, an acoustical analysis is required as part of the environmental review process so that noise mitigation may be considered in the project design. The acoustical analysis shall:

- Be the responsibility of the applicant.
- Be prepared by a qualified acoustical consultant experienced in the fields of environmental noise assessment and architectural acoustics.
- Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources.
- Estimate existing and projected (20 years) noise levels in terms of the standards of Table 9-1 [Table 4.5-2] or Table 9-2 [Table 4.5-3], and compare those levels to the adopted policies of the Noise Element.
- Recommend appropriate mitigation measures to achieve compliance with the adopted policies and standards of the Noise Element.
- Estimate noise exposure after the prescribed mitigation measures have been implemented.
- Describe a post-project assessment program that could be used to monitor the effectiveness of the proposed mitigation measures.

**Policy N-P-7:** Noise level criteria applied to land uses other than residential or other noise-sensitive uses shall be consistent with noise performance levels of Table 9-1 [Table 4.5-2] and Table 9-2 [Table 4.5-3].

**Policy N-P-8:** The City shall enforce the Sound Transmission Control Standards of the California Building Code concerning the construction of new multiple occupancy dwellings such as hotels, apartments, and condominiums.

**Policy N-P-9:** New equipment and vehicles purchased by the City shall comply with noise level performance standards consistent with the best available noise reduction technology.

**Policy N-P-10:** The Manteca Police Department shall actively enforce requirements of the California Vehicle Code relating to vehicle mufflers and modified exhaust systems.

**Policy N-P-11:** For residential development backing on to a freeway or railroad right-of-way, the developer shall be required to build a sound barrier wall, and provide for other appropriate mitigation measures, to satisfy the performance standards in Table 9-1 [Table 4.5-2].

**Policy N-P-12:** The City shall require new roadways to be mitigated so as to not exceed the noise levels specified in Table 9-1 [Table 4.5-2]. Widening or other improvement projects of existing roadways shall be mitigated to the most practical extent.

**Policy N-P-13:** The City shall carefully review and shall give potentially affected residents an opportunity to fully review any proposals for the establishment of helipads or heliports.

IMPLEMENTATION N-I-1: New development in residential areas with an actual or projected exterior noise level of greater than 60 dB  $L_{dn}$  will be conditioned to use mitigation measures to reduce exterior noise levels to less than or equal to 60 dB  $L_{dn}$ .

IMPLEMENTATION N-I-2: Assist in enforcing compliance with noise emissions standards for all types of vehicles, established by the California Vehicle Code and by federal regulations, through coordination with the Manteca Police Department and the California Highway Patrol.

IMPLEMENTATION N-I-3: In making a determination of impact under the California Environmental Quality Act (CEQA), a substantial increase will occur if ambient noise levels are increased by 10 dB or more. An increase from 5-10 dB may be substantial. Factors to be considered in determining the significance of increases from 5-10 dB include:

- the resulting noise levels
- the duration and frequency of the noise
- the number of people affected
- the land use designation of the affected receptor sites
- public reactions or controversy as demonstrated at workshops or hearings, or by correspondence
- prior CEQA determinations by other agencies specific to the project

IMPLEMENTATION N-I-4: Control noise at the source through use of insulation, berms, building design and orientation, buffer space, staggered operating hours and other techniques. Use noise barriers to attenuate noise to acceptable levels.

IMPLEMENTATION N-I-5: Evaluate new transportation projects, such a rail or public transit routes, using the standards contained in Table 9-1 [Table 4.5-2]. However, noise from these projects may be allowed to exceed the standards contained in Table 9-1 [Table 4.5-2], if the City Council finds that there are special overriding circumstances.

IMPLEMENTATION N-I-6: Require an acoustical analysis where:

- Noise sensitive land uses are proposed in areas exposed to existing or projected noise levels exceeding the levels specified in Table 9.1 [Table 4.5-2] or 9.2 [Table 4.5-3].
- Proposed transportation projects are likely to produce noise levels exceeding the levels specified in Table 9.1 [Table 4.5-2] or 9.2 [Table 4.5-3] at existing or planned noise sensitive uses.

## 4.0 HAZARDS, SAFETY, AND NOISE

IMPLEMENTATION N-I-7: Require that all acoustical analyses utilize a consistent format and be prepared in accordance with Policy N-P-6.

IMPLEMENTATION N-I-8: Work in cooperation with Caltrans and the Union Pacific Railroad to maintain noise level standards for both new and existing projects in compliance with Table 9-1 [Table 4.5-2].

### EXISTING NOISE LEVELS

#### Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop  $L_{dn}$  (24-hour average) noise contours for all highways and major roadways in the Planning Area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model predicts hourly  $L_{eq}$  values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict  $L_{dn}$  values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic modeling performed for the Planning Area. Day/night traffic distributions were based upon continuous hourly noise measurement data and j.c. brennan & associates, Inc. file data for similar roadways. Caltrans vehicle truck counts were obtained for CA-99 and CA-120. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 4.5-4 shows the results of this analysis.

**TABLE 4.5-4: PREDICTED EXISTING TRAFFIC NOISE LEVELS**

ROADWAY	SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (DB, $L_{DN}$ ) <sup>1</sup>	DISTANCES TO TRAFFIC NOISE CONTOURS, $L_{DN}$ (FEET)		
			70 DB	65 DB	60 DB
CA-99	North of 120	75.5	212	456	982
CA-99	South of 120	77.8	482	1039	2239
CA-120	I-5 to Airport Way	75.0	560	1207	2600
CA-120	Airport Way to Manteca Rd/Main St	71.7	182	392	845
CA-120	Manteca Rd/ Main St. to CA-99	71.8	220	475	1023
Lathrop Rd	I-5 to Airport Way	69.3	43	92	199
Lathrop Rd	Airport Way to Main St	70.3	51	111	239
Lathrop Rd	Main St. to Austin Rd	71.1	58	125	270
Louise Ave	I-5 to Airport Way	64.4	24	52	111
Louise Ave	Airport Way to Manteca Rd/Main St	64.8	21	45	98
Louise Ave	Manteca Rd/Main St to Austin Rd	59.1	8	17	37
Yosemite Ave	I-5 to Airport Way	70.4	50	108	232
Yosemite Ave	Airport Way to Union Rd	71.9	72	155	333
Yosemite Ave	Union Rd to Manteca Rd/Main St	68.7	42	91	196
Yosemite Ave	Manteca Rd/Main St to CA-99	70.9	46	99	212
Yosemite Ave	CA-99 to Austin Rd	68.3	55	120	258

## 4.0 HAZARDS, SAFETY, AND NOISE

ROADWAY	SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (DB, L <sub>DN</sub> ) <sup>1</sup>	DISTANCES TO TRAFFIC NOISE CONTOURS, L <sub>DN</sub> (FEET)		
			70 DB	65 DB	60 DB
Woodward Ave	I-5 to Airport Way	58.5	7	15	32
Woodward Ave	Airport Way to Manteca Rd/Main St	59.3	10	22	47
Woodward Ave	Manteca Rd/Main St to Moffat Blvd	66.2	23	50	108
Airport Way	French Camp Rd to Lathrop Road	72.7	41	89	191
Airport Way	Lathrop Rd to Louise Ave	63.4	17	37	81
Airport Way	Louise Ave to Yosemite Ave	65.1	22	48	102
Airport Way	Yosemite Ave to CA-120	70.8	45	98	211
Airport Way	CA-120 to Woodward Ave	66.7	42	91	197
Airport Way	Woodward Ave to Nile Rd	72.1	69	148	320
Union Rd	French Camp Rd to Lathrop Road	61.4	13	29	62
Union Rd	Lathrop Rd to Louise Ave	64.3	19	41	88
Union Rd	Louise Ave to Yosemite Ave	65.9	21	46	99
Union Rd	Yosemite Ave to CA-120	70.5	50	108	232
Union Rd	CA-120 to Woodward Ave	61.3	18	39	85
Union Rd	Woodward Ave to Rippon Rd	68.8	31	68	146
Manteca Rd/Main St	Lathrop Rd to Louise Ave	67.7	34	73	158
Manteca Rd/Main St	Louise Ave to Yosemite Ave	60.1	43	94	202
Manteca Rd/Main St	Yosemite Ave to CA-120	70.2	60	130	281
Manteca Rd/Main St	CA-120 to Woodward Ave	68.0	41	89	192
Manteca Rd/Main St	Woodward Ave to Sedan Ave	67.0	21	45	97
Austin Rd	Lathrop Rd to Yosemite Ave	63.9	17	36	78
Austin Rd	Yosemite Ave to Woodward Ave	63.6	17	36	78
Austin Rd	Woodward Ave to Ripon Rd	65.9	25	54	116

NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.

<sup>1</sup> TRAFFIC NOISE LEVELS ARE PREDICTED AT THE CLOSEST SENSITIVE RECEPTORS OR AT A DISTANCE OF 100 FEET IN COMMERCIAL/RETAIL AREAS.

SOURCE: FEHR & PEERS, CALTRANS, J.C. BRENNAN & ASSOCIATES, INC., 2017.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each Planning Area roadway segment. In some locations, sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the Planning Area roadway segments analyzed in this report.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 4.5-4 are generally considered to be conservative

estimates of noise exposure along roadways in the City of Manteca. Figure 4.5-1 shows existing citywide traffic noise contours.

**Railroad Noise Levels**

In order to quantify noise exposure from existing train operations, two continuous (24-hour) noise level measurement surveys were conducted along the two Union Pacific (UP) railroad lines which run through the City. In addition to freight, the westernmost line also carries commuter trains for the Altamont Corridor Express (ACE) service which provides passenger transportation between Stockton and San Jose.

The purpose of the noise level measurements was to determine typical sound exposure levels (SEL) for railroad line operations, while accounting for the effects of travel speed, warning horns and other factors which may affect noise generation. In addition, the noise measurement equipment was programmed to identify individual train events so that the typical number of train operations could be determined.

Table 4.5-5 shows a summary of the continuous noise measurement results for railroad activity within the City.

**TABLE 4.5-5: RAILROAD NOISE MEASUREMENT RESULTS**

MEASUREMENT LOCATION	RAILROAD TRACK	GRADE CROSSING / WARNING HORN	TRAIN EVENTS PER 24-HOUR PERIOD	AVERAGE SEL AT 50 FEET
Site A	U.P. and A.C.E.	Yes	13	109 dBA
Site B	U.P.	Yes	26	108 dBA

SOURCE: J.C. BRENNAN & ASSOCIATES, INC., 2017.

Noise measurement equipment consisted of Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters equipped with LDL ½" microphones. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

To determine the distances to the day/night average (L<sub>dn</sub>) railroad contours, it is necessary to calculate the L<sub>dn</sub> for typical train operations. This was done using the SEL values and above-described number and distribution of daily train operations. The L<sub>dn</sub> may be calculated as follows:

$$L_{dn} = SEL + 10 \log N_{eq} - 49.4 \text{ dB, where:}$$

SEL is the mean Sound Exposure Level of the event, N<sub>eq</sub> is the sum of the number of daytime events (7 a.m. to 10 p.m.) per day, plus 10 times the number of nighttime events (10 p.m. to 7 a.m.) per day, and 49.4 is ten times the logarithm of the number of seconds per day. Based upon the above-described noise level data, number of operations and methods of calculation, the L<sub>dn</sub> value for railroad line operations have been calculated, and the distances to the L<sub>dn</sub> noise level contours are shown in Table 4.5-6.



**TABLE 4.5-6: APPROXIMATE DISTANCES TO THE RAILROAD NOISE CONTOURS**

EXTERIOR NOISE LEVEL AT 100 FEET, $L_{DN}$	DISTANCE TO EXTERIOR NOISE LEVEL CONTOURS, FEET		
	60 DB $L_{DN}$	65 DB $L_{DN}$	70 DB $L_{DN}$
<i>U.P. AND A.C.E LINE WITH WARNING HORNS</i>			
77 dB	642'	298'	138'
<i>UPRR – WITH WARNING HORNS</i>			
78 dB	833'	387'	179'

SOURCE: J.C. BRENNAN & ASSOCIATES, INC., 2017.

**Fixed Noise Sources**

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational, and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day, and existing ambient noise levels.

In Manteca, fixed noise sources typically include parking lots, loading docks, parks, schools, and other commercial/retail use noise sources (HVAC, exhaust fans, etc.)

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

1. To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2. To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

Fixed noise sources which are typically of concern include but are not limited to the following:

- HVAC Systems
- Pump Stations
- Steam Valves
- Generators
- Air Compressors
- Conveyor Systems
- Pile Drivers
- Drill Rigs
- Welders
- Outdoor Speakers
- Chippers
- Loading Docks
- Cooling Towers/Evaporative Condensers
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Transformers
- Grinders
- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Cutting Equipment
- Amplified Music and Voice

## 4.0 HAZARDS, SAFETY, AND NOISE

The types of uses which may typically produce the noise sources described above include, but are not limited to: wood processing facilities, pump stations, industrial/agricultural facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and special events such as concerts and athletic fields. Typical noise levels associated with various types of stationary noise sources are shown in Table 4.5-7.

**TABLE 4.5-7: TYPICAL STATIONARY SOURCE NOISE LEVELS**

USE	NOISE LEVEL AT 100 FEET, LEQ <sup>1</sup>	DISTANCE TO NOISE CONTOURS, FEET			
		50 dB LEQ (NO SHIELDING)	45 dB LEQ (NO SHIELDING)	50 dB LEQ (WITH 5 DB SHIELDING)	45 dB LEQ (WITH 5 DB SHIELDING)
Auto Body Shop	56 dB	200	355	112	200
Auto Repair (Light)	53 dB	141	251	79	141
Busy Parking Lot	54 dB	158	281	89	158
Cabinet Shop	62 dB	398	708	224	398
Car Wash	63 dB	446	792	251	446
Cooling Tower	69 dB	889	1,581	500	889
Loading Dock	66 dB	596	1,059	335	596
Lumber Yard	68 dB	794	1,413	447	794
Maintenance Yard	68 dB	794	1,413	447	794
Outdoor Music Venue	90 dB	10,000	17,783	5,623	10,000
Paint Booth Exhaust	61 dB	355	631	200	355
School Playground / Neighborhood Park	54 dB	158	281	89	158
Skate Park	60 dB	316	562	178	316
Truck Circulation	48 dB	84	149	47	84
Vendor Deliveries	58 dB	251	446	141	251

<sup>1</sup> ANALYSIS ASSUMES A SOURCE-RECEIVER DISTANCE OF APPROXIMATELY 100 FEET, NO SHIELDING, AND FLAT TOPOGRAPHY. ACTUAL NOISE LEVELS WILL VARY DEPENDING ON SITE CONDITIONS AND INTENSITY OF THE USE. THIS INFORMATION IS INTENDED AS A GENERAL RULE ONLY, AND IS NOT SUITABLE FOR FINAL SITE-SPECIFIC NOISE STUDIES.

SOURCE: J.C. BRENNAN & ASSOCIATES, INC. 2017.

### COMMUNITY NOISE SURVEY

A community noise survey was conducted to document ambient noise levels at various locations throughout the city. Short-term noise measurements were conducted at seven locations throughout the city on January 17<sup>th</sup> and 18<sup>th</sup>, 2017 during daytime and evening periods. In addition, three continuous 24-hour noise monitoring sites were also conducted to record day-night statistical noise level trends. The data collected included the hourly average ( $L_{eq}$ ), median ( $L_{50}$ ), and the maximum level ( $L_{max}$ ) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 4.5-8 and Table 4.5-9. Figure 4.5-2 shows the locations of the noise monitoring sites.

**TABLE 4.5-8: EXISTING CONTINUOUS 24-HOUR AMBIENT NOISE MONITORING RESULTS**

SITE	LOCATION	$L_{DN}$ (DBA)	MEASURED HOURLY NOISE LEVELS, DBA LOW-HIGH (AVERAGE)					
			DAYTIME (7:00 AM - 10:00 PM)			NIGHTTIME (10:00 PM - 7:00 AM)		
			$L_{EQ}$	$L_{50}$	$L_{MAX}$	$L_{EQ}$	$L_{50}$	$L_{MAX}$
A	Lathrop/Manteca Light Rail Station. 51 ft from centerline of railroad.	79	58-76 (70)	55-64 (61)	70-105 (86)	55-79 (73)	53-63 (57)	68-107 (86)
B	Manteca Community Center. 48 ft from centerline of railroad.	78	53-76 (73)	49-61 (55)	66-102 (92)	48-75 (71)	46-57 (49)	62-99 (91)
C	12878 S. Austin Rd., North boundary. 78 ft to centerline of railroad.	63	56-63 (60)	49-59 (56)	70-85 (78)	46-60 (56)	37-58 (46)	66-85 (74)
D	Cottage Ave. at SR-99, 90 feet from median of SR-99 (collected 11/13/2015)	77	70-74 (73)	67-72 (71)	82-96 (86)	67-73 (70)	59-71 (64)	80-90 (84)
E	Atherton Dr., west of Hearthsong Dr. 330-feet from centerline of SR- 120. (collected 5/24/16)	66	60-64 (61)	59-61 (60)	68-86 (73)	56-62 (60)	54-62 (58)	66-76 (71)

SOURCE – J.C. BRENNAN & ASSOCIATES, INC., 2017.

**TABLE 4.5-9: EXISTING SHORT-TERM COMMUNITY NOISE MONITORING RESULTS**

SITE	LOCATION	TIME <sup>1</sup>	MEASURED SOUND LEVEL, DB			NOTES
			$L_{EQ}$	$L_{50}$	$L_{MAX}$	
1	BMX Park on Spreckles Avenue	12:40 p.m.	59	58	68	Spreckles Ave. is the primary noise source. Freight train passed by.
		10:57 a.m.	65	64	78	Spreckles Ave. is the primary noise source.
2	Delicato Family Vineyards	1:59 p.m.	68	66	79	CA-99 is the primary noise source.
		11:28 a.m.	73	72	85	CA-99 is the primary noise source.
3	Raymus Village Park	2:40 p.m.	49	48	61	CA-99 is the primary noise source.
		11:52 a.m.	59	58	65	CA-99 is the primary noise source.
4	Airport Way, adjacent to 13033 Airport Way	3:18 p.m.	70	63	82	Airport Way is the primary noise source. Rumbling from freight trains.
		8:29 a.m.	70	66	79	Airport Way is the primary noise source.
5	Intersection of Airport Way and Fig Ave.	9:15 a.m.	65	54	78	Primary source is Airport Way.
		12:44 a.m.	67	55	82	Primary source is Airport Way.

## 4.0 HAZARDS, SAFETY, AND NOISE

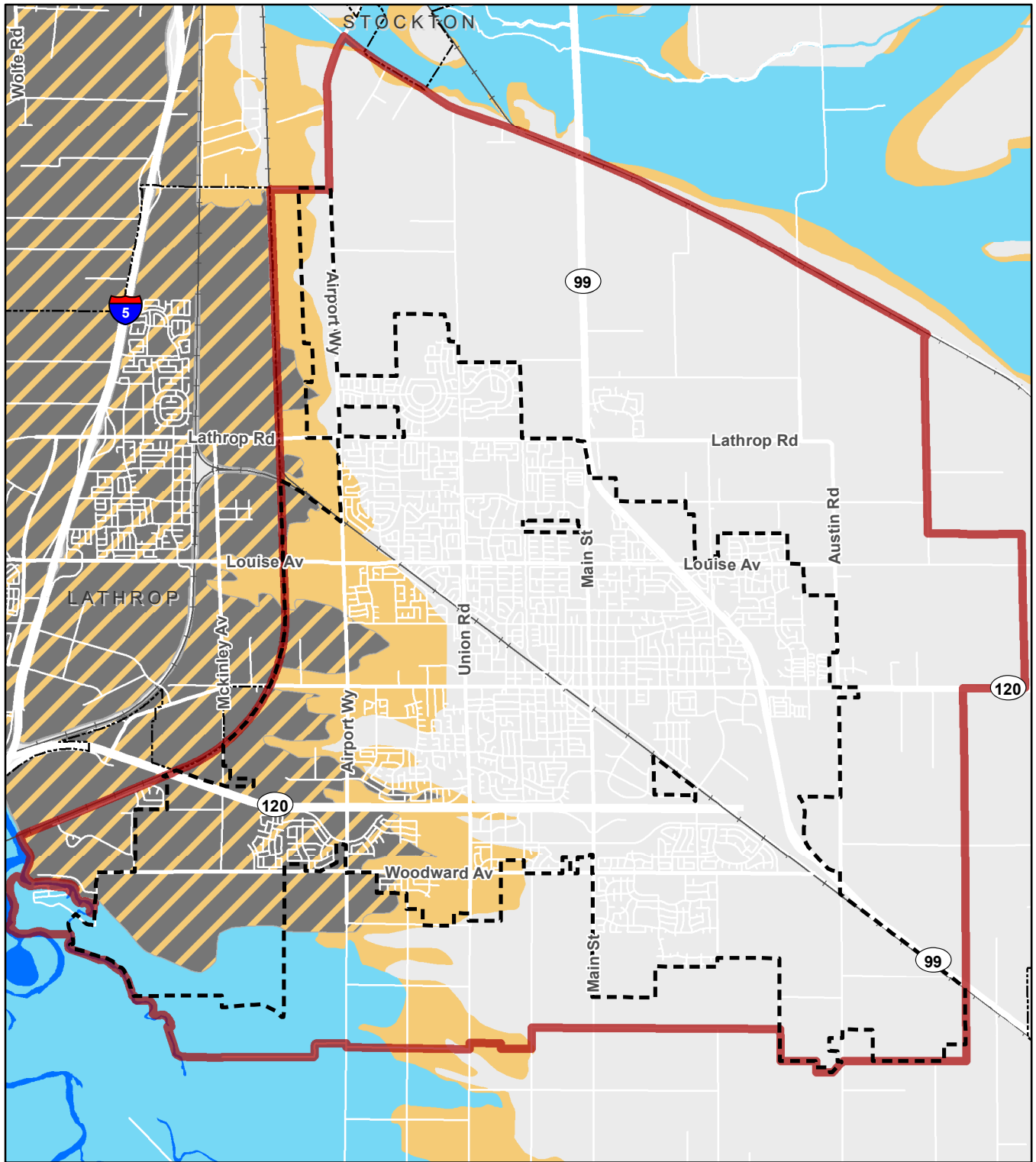
SITE	LOCATION	TIME <sup>1</sup>	MEASURED SOUND LEVEL, DB			NOTES
			L <sub>EQ</sub>	L <sub>50</sub>	L <sub>MAX</sub>	
6	Intersection of Austin Rd. and Palm Ave.	10:02 a.m.	68	58	83	Austin Rd. is primary noise source.
		1:52 p.m.	69	62	84	Austin Rd. is primary noise source.
7	Dead end of Vasconcellos Ave, adjacent to El Rancho Mobile Home Park.	10:30 a.m.	60	59	72	CA-99 is primary noise source.
		2:24 p.m.	63	57	80	CA-99 is primary noise source.

*1 - ALL COMMUNITY NOISE MEASUREMENT SITES HAVE TEST DURATIONS OF 10:00 MINUTES.*

*SOURCE - J.C. BRENNAN & ASSOCIATES, INC., 2017.*

Community noise monitoring equipment included Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters equipped with LDL ½" microphones. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

The results of the community noise survey shown in Tables 4.5-8 and 4.5-9 indicate that existing transportation noise sources were the major contributor of noise observed during daytime hours, especially during vehicle passbys.



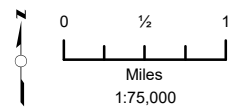
**FEMA Flood Hazards Designations**

- 1% Annual Chance Flood Hazard (100-yr Flood)
- 0.2% Annual Chance Flood Hazard (500-yr Flood)
- Area with Reduced Risk Due to Levee

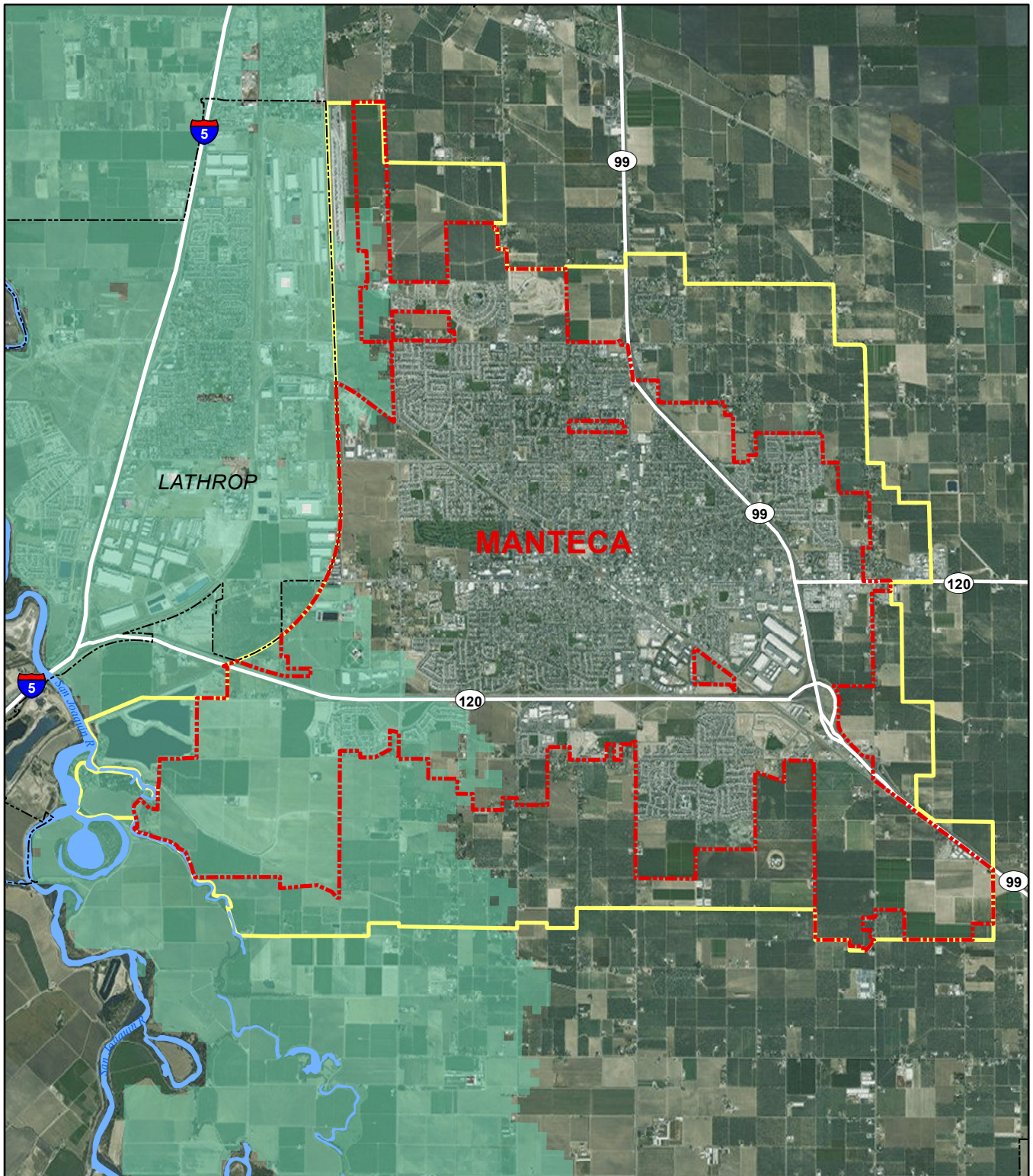
**Planning Area**

- Manteca City Limits
- Manteca Sphere of Influence

**CITY OF MANTECA GENERAL PLAN UPDATE**  
**Figure 4.4-1: FEMA Flood Zone Designations**






Source: FEMA's National Flood Hazard Layer, City of Manteca GIS.  
 Map date: October 7, 2016.

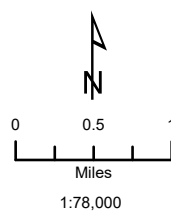


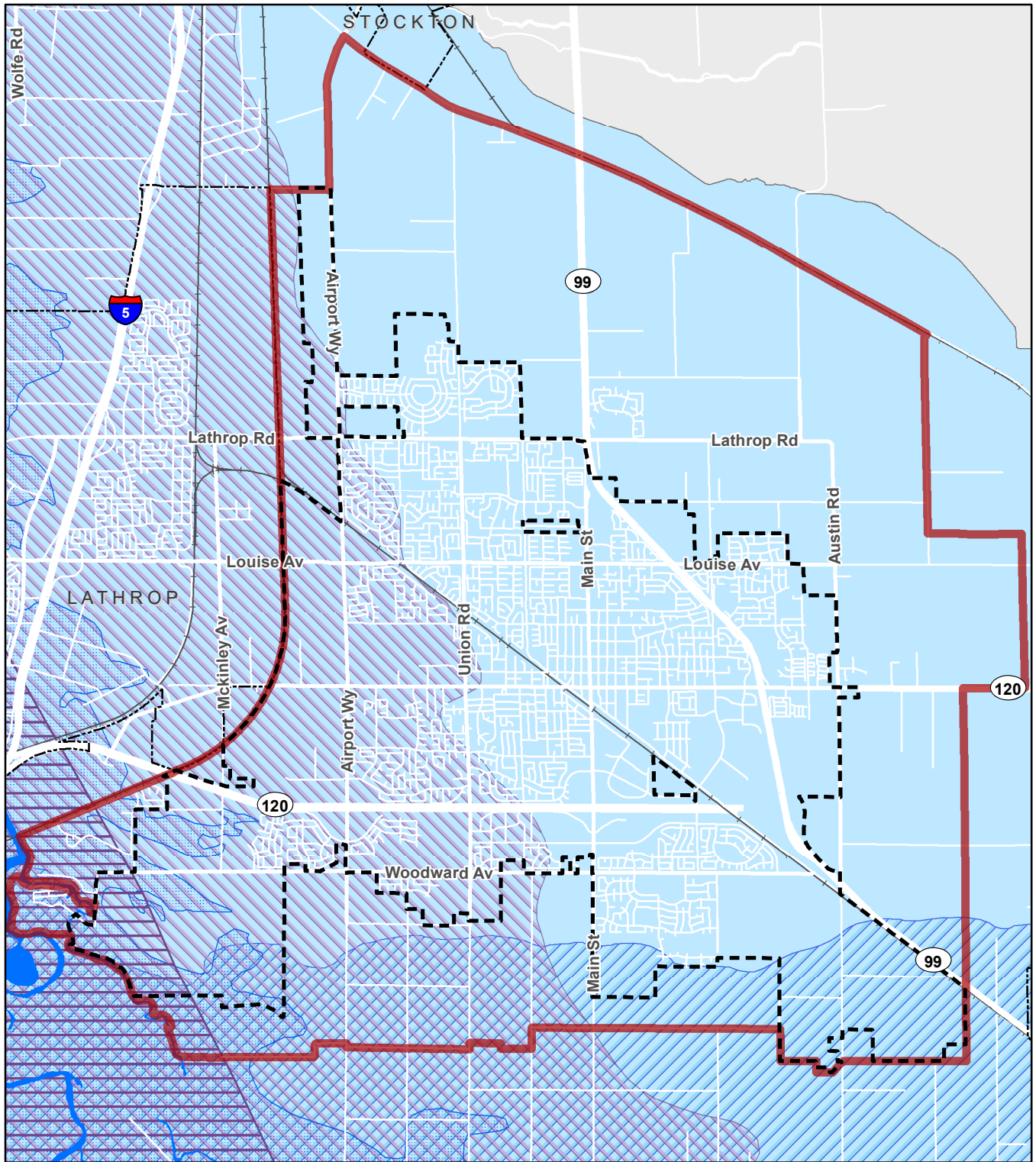
**CITY OF MANTECA GENERAL PLAN UPDATE**

Figure 4.4-2: 200-Year Floodplain

**Legend**

-  City of Manteca
-  City of Lathrop
-  City of Manteca Sphere of Influence
-  200-Year Floodplain





**OES Dam Inundation Areas**

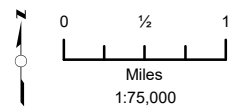
-  Pine Flat Dam
-  Tulloch Reservoir
-  Lake McClure Reservoir
-  New Melones Dam
-  San Luis Reservoir

**Planning Area**

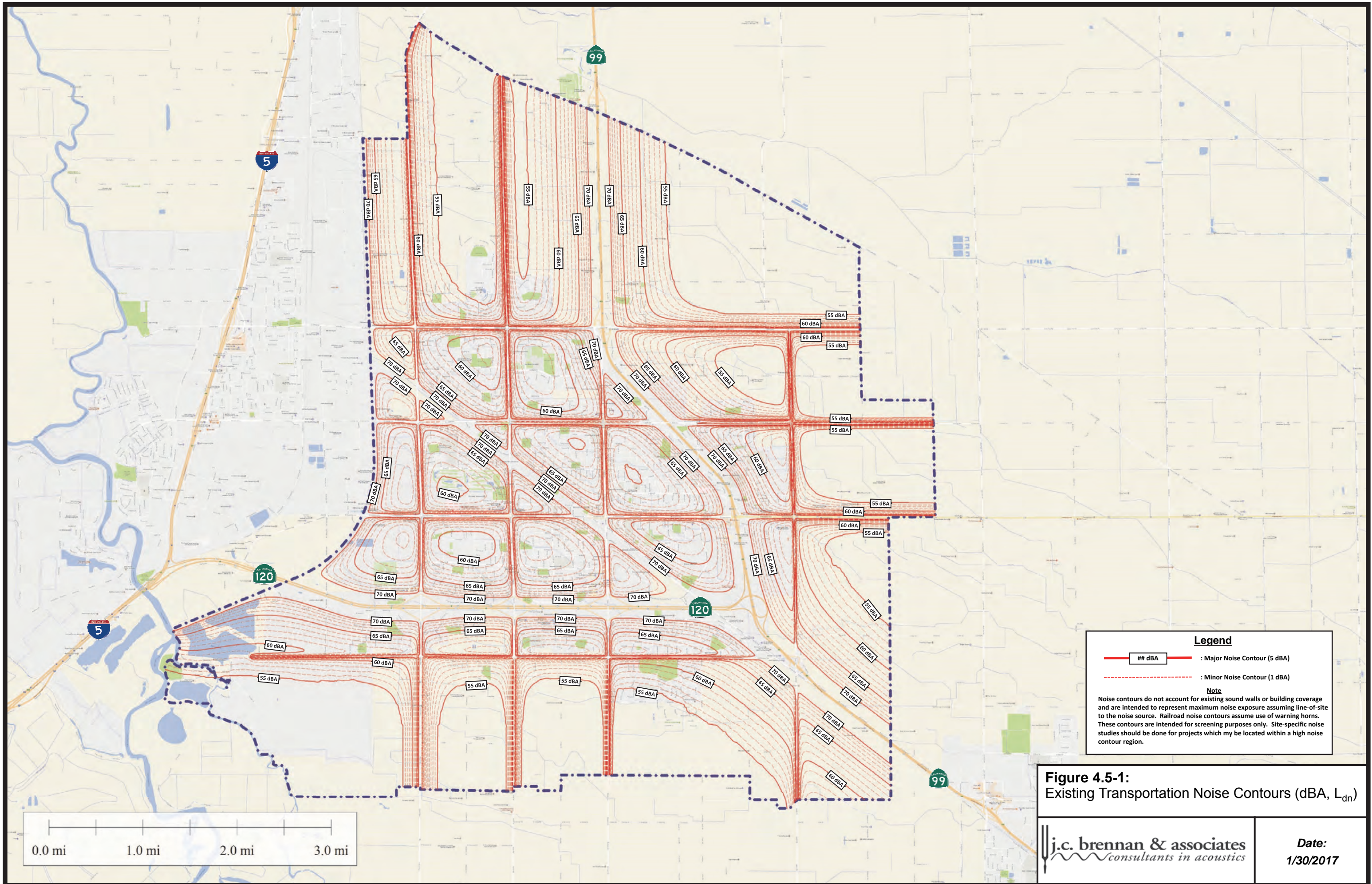
-  Manteca City Limits
-  Manteca Sphere of Influence

**CITY OF MANTECA GENERAL PLAN UPDATE**

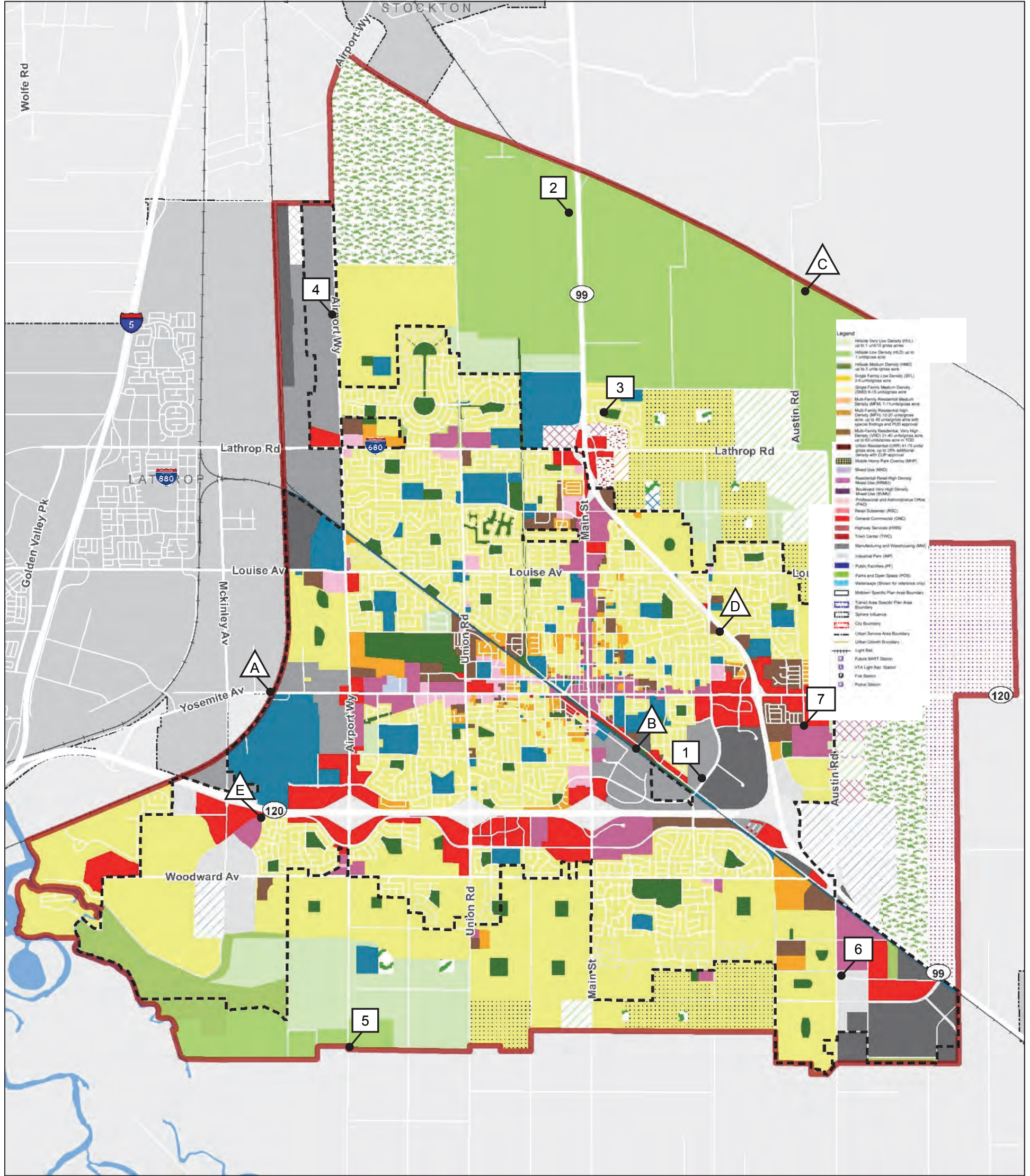
Figure 4.4-3: Dam Inundation Areas





Source: Office of Emergency Services Dam Inundation Areas offered by sjmap.org, San Joaquin County GIS, July 29, 2016; City of Manteca GIS. Map date: October 7, 2016.







- Legend**
-  : Continuous (24-hr) Noise Measurement Site
  -  : Short-Term Noise Measurement Site

**Figure 4.5-2:**  
Noise Measurement Locations

## 5.0 CONSERVATION AND NATURAL RESOURCES

The city’s natural resources form an important part of its unique character and quality of life. In an effort to identify and understand the key natural resources of the city, this chapter is divided into the following sections:

- 5.1 Cultural and Historic Resources
- 5.2 Biological Resources
- 5.3 Air Quality
- 5.4 Greenhouse Gases and Climate Change
- 5.5 Geology, Soils and Seismicity
- 5.6 Mineral and Energy Resources
- 5.7 Hydrology and Water Quality
- 5.8 Scenic Resources
- 5.9 Agricultural Resources

### 5.1 CULTURAL AND HISTORIC RESOURCES

These resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. Preservation of the city’s cultural heritage should be considered when planning for the future.

#### KEY TERMS

**Archaeology.** The study of historic or prehistoric peoples and their cultures by analysis of their artifacts and monuments.

**Complex.** A patterned grouping of similar artifact assemblages from two or more sites, presumed to represent an archaeological culture.

**Ethnography.** The study of contemporary human cultures.

**Midden.** A deposit marking a former habitation site and containing such materials as discarded artifacts, bone and shell fragments, food refuse, charcoal, ash, rock, human remains, structural remnants, and other cultural leavings.

**Paleontology.** The science of the forms of life existing in former geologic periods, as represented by their fossils.

#### REGULATORY FRAMEWORK

##### *FEDERAL*

##### **National Historic Preservation Act**

Most regulations at the Federal level stem from the National Environmental Policy Act (NEPA) and historic preservation legislation such as the National Historic Preservation Act (NHPA) of 1966, as amended. NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a

variety of individual choice." The NHPA includes regulations specifically for Federal land-holding agencies, but also includes regulations (Section 106) which pertain to all projects that are funded, permitted, or approved by any Federal agency and which have the potential to affect cultural resources. All projects that are subject to NEPA are also subject to compliance with Section 106 of the NHPA and NEPA requirements concerning cultural resources. Provisions of NHPA establish a National Register of Historic Places (The National Register) maintained by the National Park Service, the Advisory Councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs.

### **American Indian Religious Freedom Act and Native American Graves and Repatriation Act**

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes as national policy that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved. Additionally, Native American remains are protected by the Native American Graves and Repatriation Act of 1990.

### **Other Federal Legislation**

Historic preservation legislation was initiated by the Antiquities Act of 1966, which aimed to protect important historic and archaeological sites. It established a system of permits for conducting archaeological studies on Federal land, as well as setting penalties for noncompliance. This permit process controls the disturbance of archaeological sites on Federal land. New permits are currently issued under the Archeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archaeological resources on public and Native American lands. The Historic Sites Act of 1935 declared that it is national policy to "Preserve for public use historic sites, buildings, and objects of national significance."

### *STATE*

### **California Register of Historic Resources (CRHR)**

California State law also provides for the protection of cultural resources by requiring evaluations of the significance of prehistoric and historic resources identified in documents prepared pursuant to the California Environmental Quality Act (CEQA). Under CEQA, a cultural resource is considered an important historical resource if it meets any of the criteria found in Section 15064.5(a) of the CEQA Guidelines. Criteria identified in the CEQA Guidelines are similar to those described under the NHPA. The State Historic Preservation Office (SHPO) maintains the CRHR. Historic properties listed, or formally designated for eligibility to be listed, on The National Register are automatically listed on the CRHR. State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historical resource surveys.

### **California Environmental Quality Act (CEQA)**

CEQA requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources which meet significance criteria qualifying them as "unique," "important," listed on the California Register of Historic Resources (CRHR), or eligible for listing on the CRHR. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the

environment, and these effects must be addressed. If a cultural resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process.

CEQA emphasizes avoidance of archaeological and historical resources as the preferred means of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate the impacts. In order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The following are steps typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA:

- identify cultural resources,
- evaluate the significance of the cultural resources found,
- evaluate the effects of the project on cultural resources, and
- develop and implement measures to mitigate the effects of the project on cultural resources that would be significantly affected.

Treatment of paleontological resources under CEQA is generally similar to treatment of cultural resources, requiring evaluation of resources in a project's area of potential affect, assessment of potential impacts on significant or unique resources, and development of mitigation measures for potentially significant impacts, which may include monitoring combined with data recovery and/or avoidance.

### **State Laws Pertaining to Human Remains**

Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission. CEQA Guidelines (Section 15064.5) specify the procedures to be followed in case of the discovery of human remains on non-Federal land. The disposition of Native American burials falls within the jurisdiction of the Native American Heritage Commission.

Several sections of the California Public Resources Code protect paleontological resources.

Section 5097.5 prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any "vertebrate paleontological site, including fossilized footprints," on public lands, except where the agency with jurisdiction has granted express permission. "As used in this section, 'public lands' means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof."

California Public Resources Code, Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

The sections of the California Administrative Code relating to the State Division of Beaches and Parks afford protection to geologic features and "paleontological materials" but grant the director of the State park system authority to issue permits for specific activities that may result in damage to such resources, if the activities are in the interest of the State park system and for State park purposes (California Administrative Code, Title 14, Section 4307 – 4309).

### **Senate Bill 18 (Burton, Chapter 905, Statutes 2004)**

SB 18, authored by Senator John Burton and signed into law by Governor Arnold Schwarzenegger in September 2004, requires local (city and county) governments to consult with California Native American tribes to aid in the protection of traditional tribal cultural places (“cultural places”) through local land use planning. This legislation, which amended §65040.2, §65092, §65351, §65352, and §65560, and added §65352.3, §653524, and §65562.5 to the Government Code; also requires the Governor’s Office of Planning and Research (OPR) to include in the General Plan Guidelines advice to local governments on how to conduct these consultations. The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.).

### **Assembly Bill 52 (Chapter 532, Statutes of 2014)**

Assembly Bill (“AB”) 52 establishes a formal consultation process for California tribes as part of CEQA and equates significant impacts on “tribal cultural resources” with significant environmental impacts (PRC Section 21084.2). AB 52 defines a “California Native American Tribe” as a Native American tribe located in California, and included on the contact list maintained by the Native American Heritage Commission. AB 52 requires formal consultation with California Native American Tribes prior to determining the level of environmental document if a tribe has requested to be informed by the lead agency of proposed projects. AB 52 also requires that the consultation address project alternatives and mitigation measures, for significant effects, if requested by the California Native American Tribe, and that consultation be considered concluded when either the parties agree to measures to mitigate or avoid a significant effect, or the agency concludes that mutual agreement cannot be reached.

#### *LOCAL*

### **City of Manteca General Plan**

The existing City of Manteca General Plan Resource Conservation Element identifies the following goals and policies related to cultural resources:

#### **Resource Conservation Element**

**GOAL RC-11. Preserve and enhance Manteca's archaeological and historic resources for their aesthetic, educational and cultural values.**

**GOAL RC-12. Protect Manteca’s Native American heritage.**

**POLICY RC-P-37:** The City shall not knowingly approve any public or private project that may adversely affect an archaeological site without consulting the California Archaeological Inventory at Stanislaus State University, conducting a site evaluation as may be indicated, and attempting to mitigate any adverse impacts according to the recommendation of a qualified archaeologist. City implementation of this policy shall be guided by the California Environmental Quality Act (CEQA) and the National Historic Preservation Act (NHPA).

**POLICY RC-P-38:** The City shall require that the proponent of any development proposal in an area with potential archaeological resources, and specifically near the San Joaquin River and Walthall Slough, and on the east side of State Highway 99 at the Louise Avenue crossing, shall consult with the

California Archaeological Inventory, Stanislaus State University [now named: Central California Information Center of the California Historical resources Information System] to determine the potential for discovery of cultural resources, conduct a site evaluation as may be indicated, and mitigate any adverse impacts according to the recommendation of a qualified archaeologist. The survey and mitigation shall be developer funded.

**POLICY RC-P-39:** The City shall set as a priority the protection and enhancement of Manteca's historically and architecturally significant buildings.

**POLICY RC-P-40:** The City shall work with property owners seeking registration of historical structures as Historic Landmarks or listing on the Register of Historic Sites.

**POLICY RC-P-41:** The City shall prepare and adopt a Historical Preservation Ordinance.

**POLICY RC-P-42:** The City and Redevelopment Agency shall support the efforts of property owners to preserve and renovate historic and architecturally significant structures. Where such buildings cannot be preserved intact, the City shall seek to preserve the building facades.

## ENVIRONMENTAL SETTING

Cultural resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. Preservation of the city's cultural heritage should be considered when planning for the future.

### Prehistory

The Central Valley region was among the first in the state to attract intensive fieldwork, and research has continued to the present day. This has resulted in a substantial accumulation of data.

In the early decades of the 1900s, E.J. Dawson explored numerous sites near Stockton and Lodi, later collaborating with W.E. Schenck (Schenck and Dawson 1929). By 1933, the focus of work was directed to the Cosumnes locality, where survey and excavation studies were conducted by the Sacramento Junior College (Lillard and Purves 1936). Excavation data, in particular from the stratified Windmill site (CA-Sac-107), suggested two temporally distinct cultural traditions. Later work at other mounds by Sacramento Junior College and the University of California, Berkeley, enabled the investigators to identify a third cultural tradition, intermediate between the previously postulated Early and Late Horizons. The three-horizon sequence, based on discrete changes in ornamental artifacts and mortuary practices, as well as on observed differences in soils within sites (Lillard, Heizer and Fenenga 1939), was later refined by Beardsley (1954). An expanded definition of artifacts diagnostic of each time period was developed, and its application extended to parts of the central California coast. Traits held in common allow the application of this system within certain limits of time and space to other areas of prehistoric central California.

The Windmill Culture (Early Horizon) is characterized by ventrally-extended burials (some dorsal extensions are known), with westerly orientation of heads; a high percentage of burials with grave goods; frequent presence of red ocher in graves; large projectile points, of which 60 percent are of materials other than obsidian; rectangular *Haliotis* beads; *Olivella* shell beads (types A1a and L); rare use of bone; some use of baked clay objects; and well-fashioned charmstones, usually perforated.

The Cosumnes Culture (Middle Horizon) displays considerable changes from the preceding cultural expression. The burial mode is predominately flexed, with variable cardinal orientation and some

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cremations present. There are a lower percentage of burials with grave goods, and ocher staining is common in graves. *Olivella* beads of types C1, F and G predominate, and there is abundant use of green *Haliotis* sp. rather than red *Haliotis* sp. Other characteristic artifacts include perforated and canid teeth; asymmetrical and "fishtail" charmstones, usually unperforated; cobble mortars and evidence of wooden mortars; extensive use of bone for tools and ornaments; large projectile points, with considerable use of rock other than obsidian; and use of baked clay.

Hotchkiss Culture (Late Horizon) -- The burial pattern retains the use of the flexed mode, and there is wide spread evidence of cremation, lesser use of red ocher, heavy use of baked clay, *Olivella* beads of Types E and M, extensive use of *Haliotis* ornaments of many elaborate shapes and forms, shaped mortars and cylindrical pestles, bird-bone tubes with elaborate geometric designs, clam shell disc beads, small projectile points indicative of the introduction of the bow and arrow, flanged tubular pipes of steatite and schist, and use of magnesite (Moratto 1984:181-183). The characteristics noted are not all-inclusive, but cover the more important traits.

Schulz (1981), in an extensive examination of the central California evidence for the use of acorns, used the terms Early, Middle and Late Complexes, but the traits attributed to them remain generally the same. While it is not altogether clear, Schulz seemingly uses the term "Complex" to refer to the particular archeological entities (above called "Horizons") as defined in this region. Ragir's (1972) cultures are the same as Schulz's complexes.

Bennyhoff and Hughes (1984) have presented alternative dating schemes for the Central California Archeological Sequence. The primary emphasis is a more elaborate division of the horizons to reflect what is seen as cultural/temporal changes within the three horizons and a compression of the temporal span.

There have been other chronologies proposed, including Fredrickson (1973), and since it is correlated with Bennyhoff's (1977) work, it does merit discussion. The particular archeological cultural entities Fredrickson has defined, based upon the work of Bennyhoff, are patterns, phases and aspects. Bennyhoff's (1977) work in the Plains Miwok area is the best definition of the Cosumnes District, which likely conforms to Fredrickson's pattern. Fredrickson also proposed periods of time associated heavily with economic modes, which provides a temporal term for comparing contemporary cultural entities. It corresponds with Willey and Phillips' (1958) earlier "tradition", although it is tied more specifically to the archeological record in California.

### **Ethnology**

The Planning Area lies within the northern portion of the ethnographic territory of the Yokuts people. The Yokuts were members of the Penutian language family which held all of the Central Valley, San Francisco Bay Area, and the Pacific Coast from Marin County to near Point Sur. The Yokuts differed from other ethnographic groups in California as they had true tribal divisions with group names (Kroeber 1925; Latta 1949). Each tribe spoke a particular dialect, common to its members, but similar enough to other Yokuts that they were mutually intelligible (Kroeber 1925).

The Yokuts held portions of the San Joaquin Valley from the Tehachapis in the south to Stockton in the north. On the north, they were bordered by the Plains Miwok, and on the west by the Saclan or Bay Miwok and Costanoan peoples. Although neighbors were often from distinct language families, differences between the people appear to have been more influenced by environmental factors as opposed to linguistic affinities. Thus, the Plains Miwok were more similar to the nearby Yokuts than to foothill members of their own language group. Similarities in cultural inventory co-varied with distance

from other groups and proximity to culturally diverse people. The material culture of the southern San Joaquin Yokuts was therefore more closely related to that of their non-Yokuts neighbors than to that of Delta members of their own language group.

Trade was well developed, with mutually beneficial interchange of needed or desired goods. Obsidian, rare in the San Joaquin Valley, was obtained by trade with Paiute and Shoshoni groups on the eastern side of the Sierra Nevada, where numerous sources of this material are located, and to some extent from the Napa Valley to the north. Shell beads, obtained by the Yokuts from coastal people, and acorns, rare in the Great Basin, were among many items exported to the east by Yokuts traders (Davis 1961).

Economic subsistence was based on the acorn, with substantial dependency on gathering and processing of wild seeds and other vegetable foods. The rivers, streams, and sloughs that formed a maze within the valley provided abundant food resources such as fish, shellfish, and turtles. Game, wild fowl, and small mammals were trapped and hunted to provide protein augmentation of the diet. In general, the eastern portion of the San Joaquin Valley provided a lush environment of varied food resources, with the estimated large population centers reflecting this abundance (Cook 1955; Baumhoff 1963).

Settlements were oriented along the water ways, with their village sites normally placed adjacent to these features for their nearby water and food resources. House structures varied in size and shape (Latta 1949; Kroeber 1925), with most constructed from the readily available tules found in the extensive marshes of the low-lying valley areas. The housepit depressions for the structures ranged in diameter from 3 meters to 18 meters (Wallace 1978:470).

### **Historic Period Background**

The northern section of the City of Manteca lies on a portion of the Rancho Campo de los Franceses, the ranch named for the early camp first occupied by French-Canadian trappers employed by the Hudson's Bay Company in 1832. The site of the present-day location of French Camp was the terminus of the Oregon Trail used by the trappers between 1832 and 1845. In 1843, William Gulnac, likely one of the trappers who had become a Mexican citizen, with Charles Weber, later founder of Stockton, organized a company of 12 men for the purpose of forming a colony at French Camp. Gulnac filed for a land grant, and was awarded a large tract of land including French Camp and the later site of Stockton by the Mexican government.

The first extensive wheat-growing in the San Joaquin Valley took place on the sand plains in the region between Stockton and Manteca and on the west side of the valley between Tracy and Newman. The wheat growing was due to an initial experiment of John Wheeler Jones, who planted 160 acres to wheat in 1855 which included the central town site of what is now Manteca. He plowed his fields with a walking plow. The famous Stockton gang-plow was reported to be invented near the present site of Manteca (Smith 1960: 221, 243).

When the Visalia Branch of the Central Pacific Railroad (later the Fresno Branch of the Southern Pacific) was completed through the San Joaquin Valley, a shipping point was set up in the region and named Cowell or Cowell Station for Joshua Cowell, who had donated the right of way for the railroad. Maps of the area printed in the early San Joaquin County history shows scattered ranches in the area on large tracts of land (Thompson and West 1879). The town became a supply center for the region.

The station was re-named Manteca in 1904 or 1905 by the Southern Pacific for a local creamery that had taken its name from the Spanish word for "butter" or "lard" (Gudde 1969: 191). Another version of the



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naming of the town is that the Southern Pacific misprinted the name of the “Monteca” as “Manteca”, and would not change the spelling (Hillman and Covello 1985).

After irrigation systems were developed, the large tracts of land formerly cultivated by dry land crops such as grain could be converted to use for orchards, alfalfa, diversified crops and large-scale dairying. Within a short time after the completion of the first irrigation system in the region by the Stanislaus and San Joaquin Water Company, the population of the town grew from 80 to about 500. Further growth occurred with the creation of the South San Joaquin Irrigation District in 1909 and the completion of Goodwin Dam on the Stanislaus River and associated canals in 1913 (Hillman and Covello 1985).

Industries in the area were agricultural in nature for many years, with stockyards, dairy farms, pumpkins and sugar beets being important economically. The Spreckels Sugar Company opened a mill in 1918 that remained an important industry in the region.

The population of Manteca began to grow at a rapid rate in the early 1950s, with the town serving as a bedroom community for industrial plants in San Joaquin County communities. Beginning in the 1970s, improvements to community infrastructure and the attractive pricing of homes brought even more growth (Hillman and Covello 1985). The pattern of rapid growth continues to this day, with industrial development in the area, as well as many residents commuting daily to the Bay Area.

### Cultural Resources

Ninety-five cultural resources have been identified within the Planning Area, according to files maintained by the Central California Information Center (CCIC) of the California Historical Resources Information System (CHRIS). The ninety-five recorded cultural resources span both the prehistoric and historic periods and range from a Native American village site to historic period railroads, schools, buildings, and single-family homes (see Table 5.1.1)

**TABLE 5.1-1: RESOURCES LISTED WITH THE CENTRAL CALIFORNIA INFORMATION CENTER FILE DIRECTORY**

<i>PROPERTY #</i>	<i>ADDRESS</i>	<i>PERIOD/TYPE</i>	<i>NAME</i>
P-39-000002 (CA-SJO-250H)	Not Listed	Historic	Southern Pacific Railroad in San Joaquin County
P-39-000015 (CA-SJO-256H)	Not Listed	Historic	Tidewater Southern Railway
P-39-000098 (CA-SJO-292H)	Not Listed	Historic	Western Pacific Railroad / Union Pacific Railroad
P-39-000099	Not Listed	Historic	Canal T and Drainage Canal, South San Joaquin Irrigation District
P-39-000102	Not Listed	Historic	Canal R, South San Joaquin Irrigation District
P-39-000103	Not Listed	Historic	Drainage Ditch, South San Joaquin Irrigation District
P-39-000111	Not Listed	Historic	East Union Cemetery
P-39-000133	Not Listed	Historic	Sharpe Facility Railroad System
P-39-000282 (CA-SJO-165/H)	Not Listed	Prehistoric Historic	Brown Site
P-39-000354 (CA-SJO-241H)	Not Listed	Historic	Permanente Metals Corporation Magnesium Plant
P-39-000394	Not Listed	Historic	Old French Camp Road
P-39-004187	2060 East Yosemite Avenue, Manteca	Historic/Single Family Residence	2060 East Yosemite Avenue
P-39-004188	2137 East Yosemite Avenue, Manteca	Historic/Single	2137 East Yosemite Avenue

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<i>PROPERTY #</i>	<i>ADDRESS</i>	<i>PERIOD/TYPE</i>	<i>NAME</i>
		Family Residence	
P-39-004189	2176 East Yosemite Avenue, Manteca	Historic/Single Family Residence	2176 East Yosemite Avenue
P-39-004190	2234 East Yosemite Avenue, Manteca	Historic/Single Family Residence	2234 East Yosemite Avenue
P-39-004191	10853 Austin Road, Manteca	Historic/Single Family Residence	10853 Austin Road
P-39-004192	Not Listed	Historic	Calaveras, Calla, Carnegie, and Castle Schools
P-39-004272	1810 East Yosemite Avenue, Manteca	Historic/Single Family Residence	1810 East Yosemite Avenue
P-39-004273	Not Listed	Historic/Bridge	Bridge 29-0125L and Bridge 29-0125R
P-39-004400	8800 Woodward Avenue, Manteca	Historic/Single Family Residence	8800 Woodward Avenue
P-39-004401	9308 Woodward Avenue, Manteca	Historic/Single Family Residence	9308 Woodward Avenue
P-39-004402	9336 Woodward Avenue, Manteca	Historic/Single Family Residence	9336 Woodward Avenue
P-39-004403	9362 Woodward Avenue, Manteca	Historic/Single Family Residence	9362 Manteca Avenue
P-39-004404	19362 South Austin Road, Manteca	Historic/Single Family Residence	19362 South Austin Road
P-39-004405	19408 South Austin Road, Manteca	Historic/Single Family Residence	19408 South Austin Road
P-39-004406	135 Cottage Avenue, Manteca	Historic/Single Family Residence	135 Cottage Avenue
P-39-004407	2057 East Yosemite Avenue, Manteca	Historic/Single Family Residence	2057 East Yosemite Avenue
P-39-004408	18102 South Austin Road, Manteca	Historic/Single Family Residence	18102 South Austin Road
P-39-004409	18294 South Austin Road, Manteca	Historic/Single Family Residence	18294 South Austin Road
P-39-004410	18352 South Austin Road, Manteca	Historic/Single Family Residence	18352 South Austin Road
P-39-004411	18498 South Austin Road, Manteca	Historic/Single Family Residence	18498 South Austin Road
P-39-004412	18536 South Austin Road, Manteca	Historic/Single Family Residence	18536 South Austin Road
P-39-004413	18566 South Austin Road, Manteca	Historic/Single Family Residence	18566 South Austin Road
P-39-004414	18660 South Austin Road, Manteca	Historic/Single Family Residence	18660 South Austin Road
P-39-004415	18742 South Austin Road, Manteca	Historic/Single Family Residence	18742 South Austin Road
P-39-004416	18816 South Austin Road, Manteca	Historic/Single Family Residence	18816 South Austin Road
P-39-004417	19090 South Austin Road	Historic Ancillary Building	Metal Barn, 19090 South Austin Road
P-39-004494	14580 Airport Way, Manteca	Historic/Single Family Residence	14580 Airport Way
P-39-004495	14745 South Union Road, Manteca	Historic/Farm Ranch	14745 South Union Road
P-39-004496	3833 Lathrop Road, Manteca	Historic/Single Family Residence	3833 Lathrop Road
P-39-004497	3807 Lathrop Road, Manteca	Historic/Single	3807 Lathrop Road, Manteca

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<i>PROPERTY #</i>	<i>ADDRESS</i>	<i>PERIOD/TYPE</i>	<i>NAME</i>
		Family Residence	
P-39-004498	14875 South Union Road, Manteca	Historic/Single Family Residence	16875 South Union Road
P-39-004499	4513 Lathrop Road, Manteca	Historic/Public Utility Building	4513 Lathrop Road
P-39-004500	14842 South Union Road, Manteca	Historic/Single Family Residence	14842 South Union Road
P-39-004501	14808 South Union Road, Manteca	Historic/Single Family Residence	14808 South Union Road
P-39-004502	14596 South Union Road, Manteca	Historic/Single Family Residence	14596 South Union Road
P-39-004503	14444 South Union Road, Manteca	Historic/Single Family Residence	14444 South Union Road
P-39-004646 (CA-SJO-316H)	Not Listed	Historic/Road	Historic French Camp Road
P-39-004864 (CA-SJO-319H)	Not Listed	Historic/Refuse Scatter	AR1H
P-39-004865	Not Listed	Historic/Water Conveyance System	AR2H
P-39-004866	Not Listed	Historic/Water Conveyance System	AR4H
P-39-004913	2064 North Union Road, Manteca	Historic/Single Family Residence	2064 North Union Road
P-39-005000	Not Listed	Historic/School	Lincoln School (Manteca)
P-39-005001	Not Listed	Historic/School	Lindberg, Linden Elementary, Linden High Schools
P-39-005002	Not Listed	Historic/School	Tyler (John), Union/East Unions, Valencia Schools
P-39-005004	Not Listed	Historic/School	Manteca Unified School District/Manteca/Yosemite School
P-39-005005	Not Listed	Historic/School	Mandeville/King Island Schools and Manteca High School
P-39-005046	Not Listed	Historic/School	Rustic School
P-39-005082	Not Listed	Historic/Engineering Structure	City of Manteca Municipal Water Tower and Tank
P-39-005086	Not Listed	Historic/Engineering Structure	RD 17 West Levee/Walthal Slough Dry Land Levee
P-39-005090	1110 Stonum Lane, Manteca	Historic/School	Elliot (Brock) School
P-39-005092	Not Listed	Historic/School	Golden West/Grant (Ulysses S.) Schools
P-39-005097	Not Listed	Historic/School	New Haven School
P-39-005098	710 Martha Street, Manteca	Historic/School	Sequoia Elementary School
P-39-005099	Not Listed	Historic/School	Shasta and Sierra Middle School
P-39-005156 (CA-SJO-341H)	19119 McKinley Avenue, Manteca	Historic/Foundation, Refuse Scatter	19119 McKinley Avenue
P-39-005157	18871 McKinley Avenue, Manteca	Historic/Single Family Residence	18871 McKinley Avenue
P-39-005158	Not Listed	Historic/	Manteca-Vierra, Schulte SW Trans

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<i>PROPERTY #</i>	<i>ADDRESS</i>	<i>PERIOD/TYPE</i>	<i>NAME</i>
		Engineering Structure	Line
P-39-005159	19020 McKinley Avenue, Manteca	Historic/Single Family Residence	19020 McKinley Avenue
P-39-005160	19160 McKinley Avenue, Manteca	Historic/Single Family Residence	19160 McKinley Avenue
P-39-005161	19365 McKinley Avenue, Manteca	Historic/Single Family Residence	19365 McKinley Avenue, Duvan Kennel
P-39-005162	19465 McKinley Avenue, Manteca	Historic/Single Family Residence	19465 McKinley Avenue
P-39-005163	19589 McKinley Avenue, Manteca	Historic/Single Family Residence	19589 McKinley Avenue
P-39-005164	2693 Bronzan Road, Manteca	Historic/Single Family Residence	2693 Bronzan Road
P-39-005165	2785 Bronzan Road, Manteca	Historic/Single Family Residence	2785 Bronzan Road
P-39-005203	11659 South Highway 99, Manteca	Historic/Single Family Residence	11659 South Highway 99
P-39-005204	11845 South Highway 99, Manteca	Historic/Single Family Residence	11845 South Highway 99
P-39-005205	11879 South Highway 99, Manteca	Historic/Single Family Residence	11879 South Highway 99
P-39-005206	11923 South Highway 99, Manteca	Historic/Single Family Residence	11923 South Highway 99
P-39-005207	14900 Frontage Road, Manteca	Historic/Single Family Residence	14900 Frontage Road
P-39-005208	15051-15053 Frontage Road, Manteca	Historic/Single Family Residence	15051-15053 Frontage Road
P-39-005209	15141 Frontage Road, Manteca	Historic/Single Family Residence	15141 Frontage Road
P-39-005210	15100 Frontage Road, Manteca	Historic/Single Family Residence	15100 Frontage Road
P-39-005211	15230 Frontage Road, Manteca	Historic/Single Family Residence/Farm Ranch	15230 Frontage Road
P-39-005212	15255 Frontage Road, Manteca	Historic/Commercial Building	15255 Frontage Road
P-39-005213	Not Listed	Historic/Multiple Family Property	Southland Mobile Home Park
P-39-005214	5936 East Lathrop Road, Manteca	Historic/Single Family Residence	5936 East Lathrop Road
P-39-005215	5958 East Lathrop Road, Manteca	Historic/Single Family Residence	5958 East Lathrop Road
P-39-005216	6000, 6000B, 6000C, 6032 East Lathrop Road, Manteca	Historic/Single Family Residence/Commercial Building	6000, 8000B, 6000C, 6032 East Lathrop Road
P-39-005217	6160 East Lathrop Road, Manteca	Historic/Single Family Residence/Farm Ranch	6160 East Lathrop Road
P-39-005218	6404 East Lathrop Road, Manteca	Historic/Single Family	6404 East Lathrop Road

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PROPERTY #	ADDRESS	PERIOD/TYPE	NAME
		Residence/Farm Ranch	
P-39-005219	6600 East Lathrop Road, Manteca	Historic/Multiple Family Property	6600 East Lathrop Road
P-39-005220	1848 North Main Street, Manteca	Historic/Single Family Residence	1848 North Main Street
P-39-005221	1850 North Main Street, Manteca	Historic/Single Family Residence/Commercial	Casey's Garage
P-39-005222	Not Listed	Historic/Single Family Residence	Magna Terrace Estates, Unit No. 1

SOURCE: CENTRAL CALIFORNIA INFORMATION CENTER (CCIC) OF THE CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM (CHRIS)

Six additional built resources within the Planning Area are identified in the San Joaquin County Historic Property Data File Directory (see Table 5.1-2).

**TABLE 5.1-2: BUILDINGS LISTED ON THE SAN JOAQUIN COUNTY HISTORIC PROPERTY DATA FILE DIRECTORY**

PROPERTY #	ADDRESS	YEAR BUILT	NAME
068123	Maple Street, Manteca	Not Listed	Jesse Building
180296	1155 Virginia Street, Manteca	Not Listed	Not Listed
172503	1053 West Lathrop Road, Manteca	Not Listed	Not Listed
069125	West Yosemite Avenue, Manteca	Not Listed	Home Run Hot Dogs
069126	118 West Yosemite Avenue, Manteca	Not Listed	Warren's Shoes
069124	123 West Yosemite Avenue, Manteca	Not Listed	Manteca Drugs

SOURCE: SAN JOAQUIN COUNTY HISTORIC PROPERTY DATA FILE DIRECTORY

There are no properties or districts currently listed on the National Register of Historic Places or California Register of Historic Places within the Planning Area ([www.nationalregisterofhistoricplaces.com](http://www.nationalregisterofhistoricplaces.com)).

### Consultation

Letters were sent to: The Native American Heritage Commission; Ms. Roselynn Lwenya, Buena Vista Rancheria; Mr. Randy Yonemura, Lone Band of Miwok Indians; Ms. Katherine Erolinda Perez, Northern Valley Yokut Tribe; Mr. Gene Whitehouse, Chairman, United Auburn Indian Community of the Auburn Rancheria; Mr. Michael Mirelez, Torres Martinez Desert Cahuilla Indians; Ms. Rhonda Morningstar Pope, Chairperson, Buena Vista Rancheria of Me-Wuk Indians; Ms. Crystal Martinez, Chairperson, Lone Band of Miwok Indians; Ms. Lois Martinez, Chairperson, Southern Sierra Miwok Nation; Mr. Raymond Hitchcock, Chairperson, Wilton Rancheria; and, California Valley Miwok Tribe. The Native American Heritage Commission responded with a letter dated May 15, 2017. Mr. Robert Columbro, Tribal Historic Preservation Officer, Buena Vista Rancheria of Me-Wuk Indians responded with a letter dated May 22, 2017 stating that the Rancheria respectively declined to become involved in consultation. The Wilton Rancheria responded by letter dated June 16, 2017 requesting formal consultation with the City of Manteca under SB18.

### Paleontological Resources

Among the natural resources deserving conservation and preservation, and existing within the update Study Area, are the often-unseen records of past life buried in the sediments and rocks below the pavement, buildings, soils, and vegetation which now cover most of the area. These records – fossils and

their geologic context – undoubtedly exist in large quantities below the surface in many areas in and near the City of Brentwood, and span millions of years in age of origin. Fossils constitute a non-renewable resource: Once lost or destroyed, the exact information they contained can never be reproduced.

Paleontology is the science that attempts to unravel the meaning of these fossils in terms of the organisms they represent, the ages and geographic distribution of those organisms, how they interacted in ancient ecosystems and responded to past climatic changes, and the changes through time of all of these aspects.

The sensitivity of a given area or body of sediment with respect to paleontological resources is a function of both the potential for the existence of fossils and the predicted significance of any fossils which may be found there. The primary consideration in the determination of paleontological sensitivity of a given area, body of sediment, or rock formation is its potential to include fossils. Information that can contribute to assessment of this potential includes: 1) direct observation of fossils within the project area; 2) the existence of known fossil localities or documented absence of fossils in the same geologic unit (e.g., “Formation” or one of its subunits); 3) descriptive nature of sedimentary deposits (such as size of included particles or clasts, color, and bedding type) in the area of interest compared with those of similar deposits known elsewhere to favor or disfavor inclusion of fossils; and 4) interpretation of sediment details and known geologic history of the sedimentary body of interest in terms of the ancient environments in which they were deposited, followed by assessment of the favorability of those environments for the preservation of fossils.

The most general paleontological information can be obtained from geologic maps, but geologic cross sections (slices of the layer cake to view the third dimension) must be reviewed for each area in question. These usually accompany geologic maps or technical reports. Once it can be determined which formations may be present in the subsurface, the question of paleontological resources must be addressed. Even though a formation is known to contain fossils, they are not usually distributed uniformly throughout the many square miles the formation may cover. If the fossils were part of a bay environment when they died, perhaps a scattered layer of shells will be preserved over large areas. If on the other hand, a whale died in this bay, you might expect to find fossil whalebone only in one small area of less than a few hundred square feet. Other resources to be considered in the determination of paleontological potential are regional geologic reports, site records on file with paleontological repositories and site-specific field surveys.

Paleontologists consider all vertebrate fossils to be of significance. Fossils of other types are considered significant if they represent a new record, new species, an oldest occurring species, the most complete specimen of its kind, a rare species worldwide, or a species helpful in the dating of formations. However, even a previously designated low potential site may yield significant fossils.

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## 5.2 BIOLOGICAL RESOURCES

This section describes biological resources in the Planning Area from both a qualitative and quantitative perspective. The results of this assessment may be used in planning and management decisions that may affect biological resources in the Planning Area.

### KEY TERMS

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The following key terms are used throughout this section to describe biological resources and the framework that regulates them:

**Hydric Soils.** One of the three wetland identification parameters, according to the Federal definition of a wetland, hydric soils have characteristics that indicate they were developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season. There are approximately 2,000 named soils in the United States that may occur in wetlands.

**Hydrophytic Vegetation.** Plant types that typically occur in wetland areas. Nearly 5,000 plant types in the United States may occur in wetlands. Plants are listed in regional publications of the U.S. Fish and Wildlife Service (USFWS) and include such species as cattails, bulrushes, cordgrass, sphagnum moss, bald cypress, willows, mangroves, sedges, rushes, arrowheads, and water plantains.

**Sensitive Natural Community.** A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, State, or Federal agencies. CEQA identifies the elimination or substantial degradation of such communities as a significant impact. The California Department of Fish and Wildlife (CDFW) tracks sensitive natural communities in the California Natural Diversity Database (CNDDB).

**Special-Status Species.** Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by Federal, State, or other agencies. Some of these species receive specific protection that is defined by Federal or State endangered species legislation. Others have been designated as "sensitive" on the basis of adopted policies and expertise of State resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this report, following a convention that has developed in practice but has no official sanction. For the purposes of this assessment, the term "special status" includes those species that are:

- Federally listed or proposed for listing under the Federal Endangered Species Act (50 CFR 17.11-17.12);
- Candidates for listing under the Federal Endangered Species Act (61 FR 7596-7613);
- State listed or proposed for listing under the California Endangered Species Act (14 CCR 670.5);
- Species listed by the U.S. Fish and Wildlife Service (USFWS) or the CDFW as a species of concern (USFWS), rare (CDFW), or of special concern (CDFW);
- Fully protected animals, as defined by the State of California (California Fish and Game Code Section 3511, 4700, and 5050);
- Species that meet the definition of threatened, endangered, or rare under CEQA (CEQA Guidelines Section 15380);



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- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.); and
- Plants listed by the California Native Plant Society (CNPS) as rare, threatened, or endangered (List 1A and List 2 status plants in Skinner and Pavlik 1994).

**Waters of the U.S.** The Federal government defines waters of the U.S. as "lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows" [33 C.F.R. §328.3(a)]. Waters of the U.S. exhibit a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACE as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" [33 C.F.R. §328.3(e)].

**Wetlands.** Wetlands are ecologically complex habitats that support a variety of both plant and animal life. The Federal government defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" [33 C.F.R. §328.3(b)]. Wetlands require wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of wetlands include freshwater marsh, seasonal wetlands, and vernal pool complexes that have a hydrologic link to waters of the U.S.

### REGULATORY FRAMEWORK

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There are a number of regulatory agencies whose responsibility includes the oversight of the natural resources of the State and nation including the California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), the U.S. Army Corps of Engineers (USACE), and the National Marine Fisheries Service (NMFS). These agencies often respond to declines in the quantity of a particular habitat or plant or animal species by developing protective measures for those species or habitat type. The following is an overview of the Federal, State, and local regulations that are applicable to implementing the General Plan.

#### *FEDERAL*

#### **Federal Endangered Species Act**

The Federal Endangered Species Act, passed in 1973, defines an endangered species as any species or subspecies that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Once a species is listed it is fully protected from a "take" unless a take permit is issued by the United States Fish and Wildlife Service. A take is defined as the harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct, including modification of its habitat (16 USC 1532, 50 CFR 17.3). Proposed endangered or threatened species are those species for which a proposed regulation, but not a final rule, has been published in the Federal Register.

**Migratory Bird Treaty Act**

To kill, possess, or trade a migratory bird, bird part, nest, or egg is a violation of the Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., §703, Supp. I, 1989), unless it is in accordance with the regulations that have been set forth by the Secretary of the Interior.

**Bald and Golden Eagle Protection Act**

The Bald and Golden Eagle Protection Act (16 USC Section 668) protects these birds from direct take and prohibits the take or commerce of any part of these species. The USFWS administers the act, and reviews Federal agency actions that may affect these species.

**Clean Water Act – Section 404**

Section 404 of the Clean Water Act (CWA) regulates all discharges of dredged or fill material into waters of the U.S. Discharges of fill material includes the placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §323.2(f)].

Waters of the U.S. include lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows [33 C.F.R. §328.3(a)]. Wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” [33 C.F.R. §328.3(b)]. Waters of the U.S. exhibit a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACE as “that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” [33 C.F.R. §328.3(e)].

The USACE is the agency responsible for administering the permit process for activities that affect waters of the U.S. Executive Order 11990 is a Federal implementation policy, which is intended to result in no net loss of wetlands.

**Clean Water Act – Section 401**

Section 401 of the CWA (33 U.S.C. 1341) requires an applicant who is seeking a 404 permit to first obtain a water quality certification from the Regional Water Quality Control Board. To obtain the water quality certification, the Regional Water Quality Control Board must indicate that the proposed fill would be consistent with the standards set forth by the State.

**Department of Transportation Act - Section 4(f)**

Section 4(f) has been part of Federal law since 1966. It was enacted as Section 4(f) of the Department of Transportation (DOT) Act of 1966 and set forth in Title 49 United States Code (U.S.C.), Section 1653(f). In January 1983, as part of an overall recodification of the DOT Act, Section 4(f) was amended and codified in 49 U.S.C. Section 303. This law established policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites as follows:

*It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture,*

*and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities. The Secretary of Transportation may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of a historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if: a) There is no prudent and feasible alternative to using that land; and b) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.*

### **Rivers and Harbors Act of 1899**

The Rivers and Harbors Act prohibits the obstruction or alteration of any navigable water of the United States. The Act requires authorization from the USACE for any excavation or deposition of materials into these waters or for any work that could affect the course, location, condition, or capacity of rivers or harbors.

*STATE*

### **Fish and Game Code §2050-2097 - California Endangered Species Act**

The California Endangered Species Act (CESA) protects certain plant and animal species when they are of special ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. CESA established that it is State policy to conserve, protect, restore, and enhance endangered species and their habitats.

CESA was expanded upon the original Native Plant Protection Act and enhanced legal protection for plants. To be consistent with Federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Under State law, plant and animal species may be formally designated by official listing by the California Fish and Game Commission.

### **Fish and Game Code §1900-1913 California Native Plant Protection Act**

In 1977, the State Legislature passed the Native Plant Protection Act (NPPA) in recognition of rare and endangered plants of the State. The intent of the law was to preserve, protect, and enhance endangered plants. The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants. The NPPA includes provisions that prohibit the taking of plants designated as "rare" from the wild, and a salvage mandate for landowners, which requires notification of the CDFW 10 days in advance of approving a building site.

### **Fish and Game Code §3503, 3503.5, 3800 - Predatory Birds**

Under the California Fish and Game Code, all predatory birds in the order Falconiformes or Strigiformes in California, generally called "raptors," are protected. The law indicates that it is unlawful to take, possess, or destroy the nest or eggs of any such bird unless it is in accordance with the code. Any activity that would cause a nest to be abandoned or cause a reduction or loss in a reproductive effort is considered a take. This generally includes construction activities.

**Fish and Game Code §1601-1603 – Streambed Alteration**

Under the California Fish and Game Code, CDFW has jurisdiction over any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any lake or stream. Private landowners or project proponents must obtain a “Streambed Alteration Agreement” from CDFW prior to any alteration of a lake bed, stream channel, or their banks. Through this agreement, the CDFW may impose conditions to limit and fully mitigate impacts on fish and wildlife resources. These agreements are usually initiated through the local CDFW warden and will specify timing and construction conditions, including any mitigation necessary to protect fish and wildlife from impacts of the work.

**Public Resources Code § 21000 - California Environmental Quality Act**

The California Environmental Quality Act (CEQA) identifies that a species that is not listed on the Federal or State endangered species list may be considered rare or endangered if the species meets certain criteria. Under CEQA public agencies must determine if a project would adversely affect a species that is not protected by FESA or CESA. Species that are not listed under FESA or CESA, but are otherwise eligible for listing (i.e., candidate or proposed) may be protected by the local government until the opportunity to list the species arises for the responsible agency.

Species that may be considered for review are included on a list of “Species of Special Concern,” developed by the CDFW. Additionally, the California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. List 1A contains plants that are believed to be extinct. List 1B contains plants that are rare, threatened, or endangered in California and elsewhere. List 2 contains plants that are rare, threatened, or endangered in California, but more numerous elsewhere. List 3 contains plants where additional information is needed. List 4 contains plants with a limited distribution.

**Public Resources Code § 21083.4 - Oak woodlands conservation**

In 2004, the California legislature enacted SB 1334, which added oak woodland conservation regulations to the Public Resources Code. This new law requires a county to determine whether a project, within its jurisdiction, may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county must require oak woodland mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands. Such mitigation alternatives include: conservation through the use of conservation easements; planting and maintaining an appropriate number of replacement trees; contribution of funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements; and/or other mitigation measures developed by the county.

**California Oak Woodland Conservation Act**

The California Legislature passed Assembly Bill 242, known as the California Oak Woodland Conservation Act, in 2001 as a result of widespread changes in land use patterns across the landscape that were fragmenting oak woodland character over extensive areas. The Act created the California Oak Woodland Conservation Program within the Wildlife Conservation Board. The legislation provides funding and incentives to ensure the future viability of California’s oak woodland resources by maintaining large scale land holdings or smaller multiple holdings that are not divided into fragmented, nonfunctioning biological units. The Act acknowledged that the conservation of oak woodlands enhances the natural scenic beauty for residents and visitors, increases real property values, promotes ecological balance, provides habitat for over 300 wildlife species, moderates temperature extremes, reduces soil erosion,

sustains water quality, and aids with nutrient cycling, all of which affect and improve the health, safety, and general welfare of the residents of the State.

### **California Wetlands Conservation Policy**

In August 1993, the Governor announced the "California Wetlands Conservation Policy." The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.
- Reduce procedural complexity in the administration of State and Federal wetland conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetland conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

### **Natural Community Conservation Planning Act**

The Natural Community Conservation Planning Act provides long-term protection of species and habitats through regional, multi-species planning before the special measures of the CESA become necessary.

### **Porter-Cologne Water Quality Control Act**

The Porter-Cologne Water Quality Control Act authorizes the SWRCB to regulate state water quality and protect beneficial uses.

### **Water Quality Control Plan for the Sacramento-San Joaquin River Basins**

The Water Quality Control Plan for the Sacramento-San Joaquin River Basins (Basin Plan), adopted by the CVRWQCB in 1998, identifies the beneficial uses of water bodies and provides water quality objectives and standards for waters of the Sacramento River and SJR basins, including the Delta.

State and federal laws mandate the protection of designated "beneficial uses" of water bodies. State law defines beneficial uses as "domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050[f]). Additional protected beneficial uses of the SJR include groundwater recharge and fresh water replenishment.

#### *LOCAL*

### **San Joaquin County Multi-Species Habitat Conservation and Open Space Plan**

A Habitat Conservation Plan (HCP) is a federal planning document that is prepared pursuant to Section 10 of the FESA. An approved HCP within a defined plan area allows for the incidental take of species and habitat that are otherwise protected under FESA during development activities.

A Natural Community Conservation Plan (NCCP) is a state planning document administered by CDFW. An approved NCCP within a defined plan area allows for the incidental take of species and habitat that are otherwise protected under CESA during growth and development activities.

***Background:*** The key purpose of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP), is to provide a strategy for balancing the need to conserve Open Space and the need to Convert Open Space to non-Open Space uses while protecting the region's agricultural economy; preserving landowner property rights; providing for the long-term management of plant, fish and wildlife species, especially those that are currently listed, or may be listed in the future, under the Federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA); providing and maintaining multiple-use Open Spaces which contribute to the quality of life of the residents of San Joaquin County; and accommodating a growing population while minimizing costs to Project Proponents and society at large.

San Joaquin County's past and future (2001-2051) growth has affected and will continue to affect 97 special status plant, fish and wildlife species in 52 vegetative communities scattered throughout San Joaquin County's 1,400+ square miles and 900,000+ acres, which include 43% of the Sacramento-San Joaquin Delta's Primary Zone. The SJMSCP, in accordance with ESA Section 10(a)(1)(B) and CESA Section 2081(b) Incidental Take Permits, provides compensation for the Conversion of Open Space to non-Open Space uses which affect the plant, fish and wildlife species covered by the Plan, hereinafter referred to as "SJMSCP Covered Species". In addition, the SJMSCP provides some compensation to offset the impacts of open space land conversions on non-wildlife related resources such as recreation, agriculture, scenic values and other beneficial Open Space uses.

The SJMSCP compensates for Conversions of Open Space for the following activities: urban development, mining, expansion of existing urban boundaries, non-agricultural activities occurring outside of urban boundaries, levee maintenance undertaken by the San Joaquin Area Flood Control Agency, transportation projects, school expansions, non-federal flood control projects, new parks and trails, maintenance of existing facilities for non-federal irrigation district projects, utility installation, maintenance activities, managing Preserves, and similar public agency projects. These activities will be undertaken by both public and private individuals and agencies throughout San Joaquin County and within the County's incorporated cities of Escalon, Manteca, Lodi, Manteca, Ripon, Stockton and Tracy. Public agencies including Caltrans (for transportation projects), and the San Joaquin Council of Governments (for transportation projects) also will undertake activities which will be covered by the SJMSCP. In addition, 5,340 acres is allocated for anticipated projects (e.g., annexations, general plan amendments)

The 97 SJMSCP Covered Species include 25 state and/or federally listed species. The SJMSCP Covered Species include 27 plants (6 listed), 4 fish (2 listed), 4 amphibians (1 listed), 4 reptiles (1 listed), 33 birds (7 listed), 15 mammals (3 listed) and 10 invertebrates (5 listed).

***Implementation:*** The SJMSCP is administered by a Joint Powers Authority consisting of members of the San Joaquin County Council of Governments (SJCOG), the CDFW, and the USFWS. Development project applicants are given the option of participating in the SJMSCP as a way to streamline compliance with required local, State and federal laws regarding biological resources, and typically avoid having to approach each agency independently. According to the SJMSCP, adoption and implementation by local planning jurisdictions provides full compensation and mitigation for impacts to plants, fish and wildlife. Adoption and implementation of the SJMSCP also secures compliance pursuant to the state and federal laws such as CEQA, the National Environmental Policy Act (NEPA), the Planning and Zoning Law, the

## 5.0 CONSERVATION AND NATURAL RESOURCES

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State Subdivision Map Act, the Porter-Cologne Act and the Cortese-Knox Act in regard to species covered under the SJMSCP.

Applicants pay mitigation fees on a per-acre basis, as established by the Joint Powers Authority according to the measures needed to mitigate impacts to the various habitat and biological resources. Different types of land require different levels of mitigation; i.e., one category requires that one acre of a similar land type be preserved for each acre developed, while another type requires that two acres be preserved for each acre developed. The entire County is mapped according to these categories so that land owners, project proponents and project reviewers are easily aware of the applicable SJMSCP fees for the proposed development.

The appropriate fees are collected by the City and remitted to SJCOG for administration. SJCOG uses the funds to preserve open space land of comparable types throughout the County, often coordinating with other private or public land trusts to purchase conservation easements or buy land outright for preservation. Development occurring on land that has been classified under the SJMSCP as “no-pay” would not be required to pay a fee. This category usually refers to already urbanized land and infill development areas. Although the fees are automatically adjusted on an annual basis, based on the construction cost index, they often cannot keep pace with the rapidly rising land prices in the Central Valley.

### **City of Manteca General Plan**

The City of Manteca General Plan contains the following goals policies and implementation measures related to biological resources.

#### **Resource Conservation Element**

#### **GOAL RC-10. Protect sensitive native vegetation and wildlife communities and habitat in Manteca.**

**POLICY RC-P-31.** Minimize impact of new development on native vegetation and wildlife.

**POLICY RC-P-32.** Condition new development in the vicinity of the San Joaquin River and Walthall Slough to protect riparian habitat, wetlands, and other native vegetation and wildlife communities and habitats.

**POLICY RC-P-33.** Discourage the premature removal of orchard trees in advance of development, and discourage the removal of other existing healthy mature trees, both native and introduced.

**POLICY RC-P-34.** Protect special status species and other species that are sensitive to human activities.

**POLICY RC-P-35.** Allow contiguous habitat areas.

**POLICY RC-P-36.** Consider the development of new drainage channels planted with native vegetation, which would provide habitat as well as drainage.

IMEPLEMENTATION RC-I-32. Continue to support and comply with the requirements of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) when reviewing proposed public and private land use changes.

IMEPLEMENTATION RC-I-33. Project proponents who opt not to participate in the SJMSCP shall:

- Satisfy applicable U.S. Endangered Species Act (ESA), California Endangered Species Act (CESA), National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), and other applicable local, state, and federal laws and regulation provisions through consultations with the Permitting Agencies and local planning agencies.
- Provide site-specific research and ground surveys for proposed development projects. This research must include a detailed inventory of all biological resources onsite, and appropriate mitigation measures for avoiding or reducing impact to these biological resources. This requirement may be waived if determined by the City that the proposed project area is already sufficiently surveyed.

IMPLEMENTATION RC-I-34. Until such time that a Clean Water Act regional general permit or its equivalent is issued for coverage under the SJMSCP, acquisition of a Section 404 permit by project proponents will continue to occur as required by existing regulations. Project proponents shall comply with all requirements for protecting federally protected wetlands.

IMPLEMENTATION RC-I-35. Continue to enforce the City’s heritage tree ordinance which defines and identifies mature trees to be protected, and establishes regulations for their protection and removal.

IMPLEMENTATION RC-I-36. Limit the access of pedestrians and bicyclists to wetland areas so that access is compatible with long-term protection of these natural resources.

IMPLEMENTATION RC-I-37. The City shall implement multiple use of resource areas, where feasible, that includes passive recreational and educational opportunities with the protection of wildlife and vegetation habitat areas.

**City of Manteca Municipal Code**

The Manteca Municipal Code calls for the avoidance of heritage trees. Heritage trees are defined under Section 17.100.060 17.61.030 as any natural woody plant rooted in the ground and having a diameter of 30 inches or more when measured two feet above the ground. Section 17.48.060 calls for the protection of all existing trees having a diameter of six inches or more when measured 4½ feet above the ground. The City Planning Department must be notified of planned construction or grade changes within the proximity of existing mature trees. Existing trees must be protected from construction equipment, machinery, grade changes, and excavation for utilities, paving, and footers. Replacement of existing trees is subject to approval from the planning director and must be consistent with Section 17.48.060.

Section 12.08.070 of the Municipal Code prohibits cutting, pruning, removing, injuring, or interference with any tree, shrub, or plant upon or in any street tree area or other public place in the City without prior approval from the superintendent. The City is authorized to grant such permission at their discretion and where necessary. Except for utility companies, as provided in Section 12.08.080, no such permission shall be valid for a longer period than 30 days after its issuance.

**ENVIRONMENTAL SETTING**

**Geomorphic Provinces/Bioregion**

The Planning Area is located in the western portion of the Great Valley Geomorphic Province of California. The Great Valley Province is a broad structural trough bounded by the tilted block of the



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Sierra Nevada on the east and the complexly folded and faulted Coast Ranges on the west. The San Joaquin River is located just south and west of the City. This major river drains the Great Valley Province into the San Joaquin Delta to the north, ultimately discharging into the San Francisco Bay to the northwest.

The Planning Area is located within the San Joaquin Valley Bioregion, which is comprised of Kings County, most of Fresno, Kern, Merced, and Stanislaus counties, and portions of Madera, San Luis Obispo, and Tulare counties. The San Joaquin Valley Bioregion is the third most populous out of ten bioregions in the state, with an estimated 2 million people. The largest cities are Fresno, Bakersfield, Modesto, and Stockton. Interstate 5 and State Route 99 are the major north-south roads that run the entire length of the bioregion.

The bioregion is bordered on the west by the coastal mountain ranges. Its eastern boundary joins the southern two-thirds of the Sierra bioregion, which features Yosemite, Kings Canyon, and Sequoia National Parks. At its northern end, the San Joaquin Valley bioregion borders the southern end of the Sacramento Valley bioregion. To the west, south, and east, the bioregion extends to the edges of the valley floor.

Habitat in the bioregion includes vernal pools, valley sink scrub and saltbush, freshwater marsh, grasslands, arid plains, orchards, and oak savannah. Historically, millions of acres of wetlands flourished in the bioregion, but stream diversions for irrigation dried all but about five percent. Remnants of the wetland habitats are protected in this bioregion in publicly owned parks, reserves, and wildlife areas. The bioregion is considered the state's top agricultural producing region with the abundance of fertile soil.

### Vegetation

Vegetation occurring within the Planning Area primarily consists of agricultural, ruderal, and landscaping vegetation. Because of urban nature of the developed areas within the city and the active agricultural uses in surrounding lands, there is limited natural vegetation. Common plant species observed in the planning area 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*), prickly lettuce (*Lactuca serriola*), milk thistle (*Silybum marianum*), sow thistle (*Sonchus asper*), telegraph weed (*Heterotheca grandiflora*), barley (*Hordeum* sp.), mustard (*Brassica niger*), and heliotrope (*Heliotropium curassavicum*).

### Wildlife

Agricultural and ruderal vegetation found in the Planning Area provides habitat for both common and special-status wildlife populations. For example, some commonly observed wildlife species in the region include: California ground squirrel (*Spermophilus beecheyi*), California vole (*Microtus californicus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), American killdeer (*Charadrius vociferus*), gopher snake (*Pituophis melanoleucus*), garter snake (*Thamnophis species*), and western fence lizard (*Sceloporus occidentalis*), as well as many native insect species. There are also several bat species in the region. Bats often feed on insects as they fly over agricultural and natural areas.

Locally common and abundant wildlife species are important components of the ecosystem. Due to habitat loss, many of these species must continually adapt to using agricultural, ruderal, and ornamental vegetation for cover, foraging, dispersal, and nesting.

**Plant Communities**

Agricultural and natural plant communities provide habitat for a variety of biological resources in the region. Sensitive habitats include those that are of special concern to resource agencies or those that are protected under a Habitat Conservation Plan, Natural Community Conservation Plan, the California Environmental Quality Act (CEQA), the Fish and Game Code, or the Clean Water Act (CWA). Additionally, sensitive habitats are usually protected under specific policies from local agencies. Figure 5.2-1 illustrates the plant communities (land cover types) in the vicinity of the Planning Area.

**CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM**

The California Wildlife Habitat Relationship (CWHR) habitat classification scheme has been developed to support the CWHR System, a wildlife information system and predictive model for California's regularly-occurring birds, mammals, reptiles and amphibians. When first published in 1988, the classification scheme had 53 habitats. At present, there are 59 wildlife habitats in the CWHR System: 27 tree, 12 shrub, 6 herbaceous, 4 aquatic, 8 agricultural, 1 developed, and 1 non-vegetated.

According to the California Wildlife Habitat Relationship System there are eighteen cover types (wildlife habitat classifications) in the Planning Area out of 59 found in the State. These include: Annual Grassland, Barren, Cropland, Deciduous Orchard, Dryland Grain Crops, Eucalyptus, Evergreen Orchard, Fresh Emergent Wetland, Irrigated Grain Crops, Irrigated Hayfield, Irrigated Row and Field Crops, Lacustrine, Pasture, Rice, Riverine, Urban, Valley Foothill Riparian, and Vineyard.

Table 5.2-1 identifies the total area by acreage for each cover type (classification) found in Manteca. Figure 5.2-1 illustrates the location of each cover type (classification) within Manteca. A brief description of each cover type follows.

**TABLE 5.2-1: COVER TYPES - CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM**

<i>COVER TYPE</i>	<i>CITY (ACRES)</i>	<i>SOI (ACRES)</i>	<i>PLANNING AREA (TOTAL ACRES)</i>
Annual Grassland	118.58	39.34	157.93
Barren	3.05	200.51	203.56
Cropland	365.97	282.95	648.93
Deciduous Orchard	2,370.39	8,594.05	10,964.44
Dryland Grain Crops	987.08	864.38	1,851.46
Eucalyptus	1.74	0.00	1.75
Evergreen Orchard	34.92	19.57	54.49
Fresh Emergent Wetland	14.30	37.67	51.98
Irrigated Grain Crops	179.31	79.80	259.11
Irrigated Hayfield	684.38	1,047.83	1,732.22
Irrigated Row and Field Crops	749.26	283.31	1,032.56
Lacustrine	18.23	0.44	18.68
Pasture	519.95	522.23	1,042.18
Rice	0.32	1.72	2.04
Riverine	0.50	100.99	101.49
Urban	7,266.47	985.32	8,251.80
Valley Foothill Riparian	32.27	79.70	111.96

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<i>COVER TYPE</i>	<i>CITY (ACRES)</i>	<i>SOI (ACRES)</i>	<i>PLANNING AREA (TOTAL ACRES)</i>
Vineyard	38.85	427.28	466.13
<b>Total</b>	<b>13,385.59</b>	<b>13,567.09</b>	<b>26,952.68</b>

*SOURCE: SOURCE: CASIL GIS DATA, 2013, CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM, 2016*

### Developed Cover Types

**Cropland** includes a variety of sizes, shapes, and growing patterns. Field corn can reach ten feet while strawberries are only a few inches high. Although most crops are planted in rows, alfalfa hay and small grains (barley and wheat) form dense stands with up to 100 percent canopy closure. Most croplands support annuals, planted in spring and harvested during summer or fall. In many areas, second crops are commonly planted after harvesting the first. Wheat is planted in fall and harvested in late spring or early summer. Overwintering of sugar beets occurs in the Sacramento Valley, with harvesting in spring after the soil dries. Croplands are located on flat to gently rolling terrain. When flat terrain is put into crop production, it usually is leveled to facilitate irrigation. Rolling terrain is either dry farmed or irrigated by sprinklers. Soils often dictate the crops grown. Climate influences the type of crops grown. Within the Planning Area, there are 648.93 acres of cropland habitat.

**Deciduous orchards** are typically open single species tree dominated habitats. Depending on the tree type and pruning methods they are usually low, bushy trees with an open understory to facilitate harvest. Trees range in height at maturity for many species from 15 to 30 ft, but may be 10 ft or less depending on the species. Crowns usually touch, and are usually in a linear pattern. Spacing between trees is uniform depending on desired spread of mature trees. The understory is usually composed of low-growing grasses, legumes, and other herbaceous plants, but may be managed to prevent understory growth totally or partially, such as along tree rows. Deciduous orchards can be found on flat alluvial soils in the valley floors, in rolling foothill areas, or on relatively steep slopes. Though some deciduous orchards are nonirrigated, most are irrigated. Some flat soils are flood irrigated, but many deciduous orchards are sprinkler irrigated. Large numbers of orchards are irrigated by drip or trickle irrigation systems. Most deciduous orchards are in valley or foothill areas, with a few, such as, apples and pears, up to 3,000 feet elevation. Within the Planning Area, there are 10,964.44 acres of deciduous orchard habitat.

**Evergreen orchards** are typically open single species tree dominated habitats. Depending on the tree type and pruning methods they are usually low, bushy trees with an open understory to facilitate harvest. Trees range in height at maturity for many species from 15 to 30 ft, but may be 10 ft or less depending on the species. Crowns often do not touch, and are usually in a linear pattern. Spacing between trees is uniform depending on desired spread of mature trees. The understory is usually composed of low-growing grasses, legumes, and other herbaceous plants, but may be managed to prevent understory growth totally or partially, such as along tree rows. Evergreen orchards can be found on flat alluvial soils in the valley floors, in rolling foothill areas, or on relatively steep slopes. All are irrigated. Some flat soils are flood irrigated, but most evergreen orchards are sprinkler irrigated. Large numbers of orchards are irrigated by drip or trickle irrigation systems. Most evergreen orchards are in valley or foothill areas. Except for olive, most evergreen orchard trees are not very frost tolerant. Within the Planning Area, there are 54.49 acres of evergreen orchard habitat.

**Vineyards** are composed of single species planted in rows, usually supported on wood and wire trellises. Vines are normally intertwined in the rows but open between rows. Rows under the vines are usually sprayed with herbicides to prevent growth of herbaceous plants. Between rows of vines, grasses and

other herbaceous plants may be planted or allowed to grow as a cover crop to control erosion. Vineyards can be found on flat alluvial soils in the valley floors, in rolling foothill areas, or on relatively steep slopes. All are irrigated. Most vineyards are sprinkler irrigated. Large numbers of vineyards are irrigated by drip or trickle irrigation systems. Most vineyards are in valley or foothill areas. Within the Planning Area, there are 466.13 acres of vineyard habitat.

**Dryland Grain Crops** are composed of vegetation in the dryland (nonirrigated) grain and seed crops habitat includes seed producing grasses, primarily barley, cereal rye, oats, and wheat. These seed and grain crops are annuals. They are usually planted by drilling in rows which produce solid stands, forming 100 percent canopy at maturity in good stands. They are normally planted in fall and harvested in spring. However, they may be planted in rotation with other irrigated crops and winter wheat or barley may be planted after harvest of a previous crop in the fall, dry farmed (during the wet winter and early spring months), and then harvested in late spring. Within the Planning Area, there are 1,851.46 acres of Dryland Grain Crop habitat.

**Irrigated Grain Crops** include a variety of sizes, shapes and growing patterns. Field corn can reach ten feet tall while dry beans are only several inches tall. Most irrigated grain and seed crops are grown in rows. Some may form 100 percent canopy while others may have significant bare areas between rows. All seed and grain crops are annuals. They are usually planted in spring and harvested in summer or fall. However, they may be planted in rotation with other irrigated crops and sometimes winter wheat or barley may be planted after harvest of a previous crop in the fall, dry farmed (during the wet winter and early spring months) or they may be irrigated, and then harvested in the late spring. Within the Planning Area, there are 259.11 acres of Irrigated Grain Crop habitat.

**Irrigated Hayfield** normally has a 2 to 6 months initial growing period, depending on climate, and soil, this habitat is dense, with nearly 100 percent cover. Average height is about 0.46 m. (1.5 feet) tall. Planted fields generally are monocultures (the same species or mixtures or a few species with similar structural properties). Structure changes to a lower stature following each harvest, grows up again and reverts to bare ground following plowing or discing. Plowing may occur annually, but is usually less often. Layering generally does not occur in this habitat. Unplanted "native" hay fields may contain short and tall patches. If not harvested for a year, they may develop a dense thatch of dead leaves between the canopy and the ground. Within the Planning Area, there are 1,732.22 acres of Irrigated Hayfield habitat.

**Irrigated Row and Field Crops** include a variety of sizes, shapes and growing patterns. Cotton and asparagus can be three or four feet tall while others may be a foot or less high. Most irrigated row and field crops are grown in rows. Some may form 100 percent canopy while others may have significant bare areas between rows. Most are annuals, while others, such as asparagus and strawberries are perennial. The annuals are usually planted in spring and harvested in summer or fall. However, they may be planted in rotation with other irrigated crops and sometimes winter wheat or barley may be planted after harvest of a previous crop in the fall, dry farmed (during the wet winter and early spring months), and then harvested in the late spring. In some areas of southern California three crops may be grown in a year. Within the Planning Area, there are 1,032.56 acres of Irrigated Row and Field Crop habitat.

**Rice** and wild rice are flood irrigated crops that are seed producing annual grasses. Commercial rice generally is only a couple of feet tall, whereas, commercially grown wild rice may be six feet tall or taller. They are usually grown in leveed fields that are flooded much of the growing period, and dried out to mature and to facilitate harvesting. They usually produce 100 percent canopy closure as they mature.

They are usually planted in spring and harvested in fall. Within the Planning Area, there are 2.04 acres of Rice habitat.

**Urban** habitats are not limited to any particular physical setting. Three urban categories relevant to wildlife are distinguished: downtown, urban residential, and suburbia. The heavily-developed downtown is usually at the center, followed by concentric zones of urban residential and suburbs. There is a progression outward of decreasing development and increasing vegetative cover. Species richness and diversity is extremely low in the inner cover. The structure of urban vegetation varies, with five types of vegetative structure defined: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. A distinguishing feature of the urban wildlife habitat is the mixture of native and exotic species. Within the Planning Area, there are 8,251.80 acres of urban habitat.

### **Herbaceous Cover Types**

**Annual Grassland** habitat occurs mostly on flat plains to gently rolling foothills. Climatic conditions are typically Mediterranean, with cool, wet winters and dry, hot summers. The length of the frost-free season averages 250 to 300 days. Annual precipitation is highest in northern California. Within the Planning Area, there are 157.93 acres of annual grassland habitat.

**Fresh emergent wetland** habitats occur on virtually all exposures and slopes, provided a basin or depression is saturated or at least periodically flooded. They are most common on level to gently rolling topography. They are found in various depressions or at the edge of rivers or lakes. Soils are predominantly silt and clay, although coarser sediments and organic material may be intermixed. In some areas organic soils (peat) may constitute the primary growth medium. Climatic conditions are highly variable and range from the extreme summer heat to winter temperatures well below freezing. Within the Planning Area, there are 51.98 acres of fresh emergent wetland habitat.

**Pastures** are planted on flat and gently rolling terrain. Flat terrain is irrigated by the border and check method of irrigation, except on sandy soils or where water supplies are limited. Pastures established on sandy soils or hills are sprinklered. Hilly lands also use wild flooding; that is, ditches that follow the grade along ridges and hillsides, where water is released at selected points along the ditch. Climate influences the length of the growing season. For example, pastures at higher elevations or in the north have a shorter growing season. Within the Planning Area, there are 1,042.18 acres of pasture habitat.

### **Tree Dominated Cover Types**

**Valley-foothill riparian** habitats are found in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography. Valleys provide deep alluvial soils and a high water table. The substrate is coarse, gravelly, or rocky soils more or less permanently moist, but probably well aerated. Frost and short periods of freezing occur in winter (200 to 350 frost-free days). This habitat is characterized by hot, dry summers and mild and wet winters. Temperatures range from 75 to 102 F in the summer to 29 to 44 F in the winter. Average precipitation ranges from 6-30 inches, with little or no snow. The growing season is 7 to 11 months. Within the Planning Area, there are 111.96 acres of valley-foothill riparian habitat.

**Eucalyptus** habitats range from single-species thickets with little or no shrubby understory to scattered trees over a well-developed herbaceous and shrubby understory. In most cases, eucalyptus forms a dense stand with a closed canopy. Stand structure for this habitat may vary considerably because most eucalyptus have been planted into either rows for wind protection or dense groves for hardwood

production and harvesting (Cornell 1909, U.S. Forest Service 1933). Eucalyptus is often found in monotypic stands. The genus is composed of over 150 species with high morphological diversity (Cornell 1909). Thus, habitat structure may be affected if more than two or three species coexist. Tree size may vary considerably depending on spacing and species. Typically, trees may range in height from 26 to 40 m (87 to 133 ft) and have diameters (dbh) of 21.8 to 38.4 cm (8.6 to 15.1 in) (Walters 1980), with most growth occurring in the first 15 years. Trees in excess of 46 to 80 m (152 to 264 ft) are not uncommon (Munz 1974, Walters 1980). Within the Planning Area, there are 1.75 acres of Eucalyptus habitat.

### Other Habitats

**Barren** habitat is defined by the absence of vegetation. Any habitat with <2% total vegetation cover by herbaceous, desert, or non-wildland species and <10% cover by tree or shrub species is defined this way. The physical settings for permanently barren habitat represent extreme environments for vegetation. An extremely hot or cold climate, a near-vertical slope, an impermeable substrate, constant disturbance by either human or natural forces, or a soil either lacking in organic matter or excessively saline can each contribute to a habitat being inhospitable to plants. Within the Planning Area, there are 203.56 acres of barren habitat.

### Aquatic Habitats

**Riverine** habitats can occur in association with many terrestrial habitats. Riverine habitats are found adjacent to many rivers and streams. Riverine habitats are also found contiguous to lacustrine and fresh emergent wetland habitats. This habitat requires intermittent or continually running water generally originating at some elevated source, such as a spring or lake, and flows downward at a rate relative to slope or gradient and the volume of surface runoff or discharge. Velocity generally declines at progressively lower altitudes, and the volume of water increases until the enlarged stream finally becomes sluggish. Over this transition from a rapid, surging stream to a slow, sluggish river, water temperature and turbidity will tend to increase, dissolved oxygen will decrease, and the bottom will change from rocky to muddy. Within the Planning Area, there are 101.49 acres of riverine habitat.

**Lacustrine** habitats are inland depressions or dammed riverine channels containing standing water. These habitats may occur in association with any terrestrial habitats, Riverine, or Fresh Emergent Wetlands. They may vary from small ponds less than one acre to large areas covering several square miles. Depth can vary from a few inches to hundreds of feet. Typical lacustrine habitats include permanently flooded lakes and reservoirs, and intermittent lakes and ponds (including vernal pools) so shallow that rooted plants can grow over the bottom. Most permanent lacustrine systems support fish life; intermittent types usually do not. Within the Planning Area, there are 18.68 acres of lacustrine habitat.

## SPECIAL-STATUS SPECIES

The following discussion is based on a background search of special-status species that are documented in the California Natural Diversity Database (CNDDB), the California Native Plant Survey (CNPS) Inventory of Rare and Endangered Plants, and the USFWS endangered and threatened species lists. The background search was regional in scope and focused on the documented occurrences within 1 and 10 miles (9 Quad) of Manteca.

### Special Status Plants

The search revealed documented occurrences of two special status plant species (including three non-vascular plants) within one mile of the Manteca Planning Area. The search revealed documented

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occurrences of 20 special status plant species (including three non-vascular plants) within approximately 10 miles (Nine Quad) of the Manteca Planning Area.

Tables 5.2-2 and 5.2-3 provide a list of special-status plant species that are documented within one and 10 miles of the Planning Area, and their current protective status. Figure 5.2-2 illustrates the special status species located within approximately 10 miles (Nine Quad) of the Planning Area. Figure 5.2-3 illustrates the special status species located within one mile of the Planning Area.

**TABLE 5.2-2: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT (ONE MILE)**

PLANTS SPECIES	COMMON NAME	FEDERAL STATUS	CALIFORNIA STATUS
<i>Eryngium racemosum</i>	Delta button-celery	None	Endangered
<i>Trichocoronis wrightii</i> var. <i>wrightii</i>	Wright's trichocoronis	None	None

SOURCE: CDFW CNDDDB 2017

**TABLE 5.2-3: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT (10 MILE)**

PLANTS SPECIES	COMMON NAME	FEDERAL STATUS	CALIFORNIA STATUS
<i>Astragalus tener</i> var. <i>tener</i>	alkali milk-vetch	None	None
<i>Atriplex cordulata</i> var. <i>cordulata</i>	heartscale	None	None
<i>Atriplex minuscula</i>	lesser saltscale	None	None
<i>Blepharizonia plumosa</i>	big tarplant	None	None
<i>Brasenia schreberi</i>	watershield	None	None
<i>California macrophylla</i>	round-leaved filaree	None	None
<i>Carex comosa</i>	bristly sedge	None	None
<i>Chloropyron palmatum</i>	palmate-bracted salty bird's-beak	Endangered	Endangered
<i>Cirsium crassicaule</i>	slough thistle	None	None
<i>Delphinium recurvatum</i>	recurved larkspur	None	None
<i>Eryngium racemosum</i>	Delta button-celery	None	Endangered
<i>Extriplex joaquinana</i>	San Joaquin spearscale	None	None
<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	woolly rose-mallow	None	None
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	None	None
<i>Puccinellia simplex</i>	California alkali grass	None	None
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	None	None
<i>Symphyotrichum lentum</i>	Suisun Marsh aster	None	None
<i>Trichocoronis wrightii</i> var. <i>wrightii</i>	Wright's trichocoronis	None	None
<i>Trifolium hydrophilum</i>	saline clover	None	None
<i>Tropidocarpum capparideum</i>	caper-fruited tropidocarpum	None	None

SOURCE: CDFW CNDDDB 2017

### Special Status Vertebrate Animals

The search revealed documented occurrences of 23 special status animal species within 10 miles of the Planning Area. Of these species, eight are documented within one mile of the city's SOI. Tables 5.2-4, and 5.2-5 provide a list of the special-status animal species that are documented within one mile and 10 miles of the Planning Area, and current protective status. Figure 5.2-2 illustrates the location of

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documented occurrences within 10 miles, and Figure 5.2-3 shown documented occurrences within one mile of the Planning Area.

**TABLE 5.2-4: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT (ONE MILE)**

ANIMAL SPECIES	COMMON NAME	FEDERAL STATUS	CALIFORNIA STATUS
<i>Agelaius tricolor</i>	tricolored blackbird	None	Candidate Threatened
<i>Ambystoma californiense</i>	California tiger salamander	Threatened	Threatened
<i>Athene cunicularia</i>	burrowing owl	None	None
<i>Buteo swainsoni</i>	Swainson's hawk	None	Threatened
<i>Lanius ludovicianus</i>	loggerhead shrike	None	None
<i>Oncorhynchus mykiss irideus</i>	steelhead - Central Valley DPS	Threatened	None
<i>Sylvilagus bachmani riparius</i>	riparian brush rabbit	Endangered	Endangered
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	None	None

SOURCE: CDFW CNDDDB 2017

**TABLE 5.2-5: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT (10 MILE)**

ANIMAL SPECIES	COMMON NAME	FEDERAL STATUS	CALIFORNIA STATUS
<i>Agelaius tricolor</i>	tricolored blackbird	None	Candidate Threatened
<i>Ambystoma californiense</i>	California tiger salamander	Threatened	Threatened
<i>Athene cunicularia</i>	burrowing owl	None	None
<i>Branta hutchinsii leucopareia</i>	cackling (=Aleutian Canada) goose	Delisted	None
<i>Buteo swainsoni</i>	Swainson's hawk	None	Threatened
<i>Coccyzus americanus occidentalis</i>	western yellow-billed cuckoo	Threatened	Endangered
<i>Elanus leucurus</i>	white-tailed kite	None	None
<i>Eremophila alpestris actia</i>	California horned lark	None	None
<i>Falco columbarius</i>	merlin	None	None
<i>Hypomesus transpacificus</i>	Delta smelt	Threatened	Endangered
<i>Lanius ludovicianus</i>	loggerhead shrike	None	None
<i>Melospiza melodia</i>	song sparrow ("Modesto" population)	None	None
<i>Mylopharodon conocephalus</i>	hardhead	None	None
<i>Neotoma fuscipes riparia</i>	riparian (=San Joaquin Valley) woodrat	Endangered	None
<i>Oncorhynchus mykiss irideus</i>	steelhead - Central Valley DPS	Threatened	None
<i>Perognathus inornatus</i>	San Joaquin Pocket Mouse	None	None
<i>Spirinchus thaleichthys</i>	longfin smelt	Candidate	Threatened
<i>Sylvilagus bachmani riparius</i>	riparian brush rabbit	Endangered	Endangered
<i>Taxidea taxus</i>	American badger	None	None
<i>Thamnophis gigas</i>	giant gartersnake	Threatened	Threatened
<i>Vireo bellii pusillus</i>	least Bell's vireo	Endangered	Endangered
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	Endangered	Threatened
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	None	None

SOURCE: CDFW CNDDDB 2017



**Special Status Invertebrate Animals**

The search revealed documented occurrences of 10 special status invertebrate animals including insect species within 10 miles of the Planning Area. Of these species, two (western bumble bee *Bombus occidentalis*, and moestan blister beetle *Lytta moesta*) are documented within one mile of the Planning Area. Tables 5.2-6, provides a list of the special-status Invertebrate Animal species that are documented within 10 miles of the Planning Area, and their current protective status. Figure 5.2-2 illustrates the location of documented occurrences within 10 miles of Planning Area, and Figure 5.2-3 shown documented occurrences within one mile of the Planning Area.

**TABLE 5.2-6: SPECIAL STATUS INVERTEBRATE ANIMALS PRESENT OR POTENTIALLY PRESENT (10 MILE)**

<i>ANIMAL SPECIES</i>	<i>COMMON NAME</i>	<i>FEDERAL STATUS</i>	<i>CALIFORNIA STATUS</i>
<i>Anthicus sacramento</i>	Sacramento anthicid beetle	None	None
<i>Bombus caliginosus</i>	obscure bumble bee	None	None
<i>Bombus crotchii</i>	Crotch bumble bee	None	None
<i>Bombus occidentalis</i>	western bumble bee	None	None
<i>Branchinecta conservatio</i>	Conservancy fairy shrimp	Endangered	None
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	Threatened	None
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	Threatened	None
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	Endangered	None
<i>Linderiella occidentalis</i>	California linderiella	None	None
<i>Lytta moesta</i>	moestan blister beetle	None	None

SOURCE: CDFW CNDDDB 2017

**Sensitive Natural Communities**

The California Department of Fish and Wildlife (CDFW) considers sensitive natural communities to have significant biotic value, with species of plants and animals unique to each community. The CNDDDB search revealed four sensitive natural communities within 10 miles of Manteca. This includes Elderberry Savanna, Great Valley Cottonwood Riparian Forest, Great Valley Mixed Riparian Forest, and Great Valley Valley Oak Riparian Forest.

All four of these community types were once more widely distributed throughout California, but have been modified or destroyed by grazing, cultivation, and urban development. Since the remaining examples of these sensitive natural communities are under continuing threat from future development, CDFW considers them “highest inventory priorities” for future conservation. Of these sensitive natural communities documented within 10 miles of Manteca, none are located within one mile of the Manteca City limits.

**SALMON AND STEELHEAD TROUT FISHERIES**

Salmon and steelhead trout are anadromous fish species that are present in the Bay Delta and San Joaquin and Sacramento River Basins. Anadromous fish are born in freshwater rivers and streams, and then migrate to the Pacific Ocean to grow and mature before returning to their place of origin to spawn. The San Joaquin and Sacramento River system produces most of the Chinook salmon (*Oncorhynchus tshawytscha*) and a large percentage of the steelhead trout (*Oncorhynchus mykiss*) in California.

Anadromous fish resources once flourished naturally in the San Joaquin and Sacramento River system, but as a result of habitat destruction from water storage/diversion projects, flood control, mining, sedimentation, and bank degradation, they are protected species under the Federal Endangered Species Act. The San Joaquin and Sacramento River system has historically supported steelhead trout and four distinct spawning runs of Chinook salmon: fall, late fall, winter, and spring. The salmon runs have declined since the late 1800s and are now characterized as episodic. The Central Valley steelhead was Federally listed as threatened in 2003. The fall/late fall-run salmon is a Federal and State species of concern, and a candidate species for Federal listing. The spring-run Chinook salmon population is listed as threatened by both Federal and State agencies. Winter-run Chinook salmon population is listed as a Federally and State endangered species. Populations of Central Valley Steelhead and Chinook salmon are supported by natural spawning grounds and hatcheries within the San Joaquin and Sacramento River Basin.

Water remaining behind the dams by the start of the spawning run in October is often warmed by summer heat. Warm water and low water elevation are harmful to most coldwater anadromous fish species. Riparian vegetation is critical for the maintenance of high quality fish habitat. It provides cover, controls temperature, stabilizes stream banks, provides food, and buffers streams from erosion and impacts of adjacent land uses. Riparian vegetation also affects stream depth, current velocity, and substrate composition. The decline of riparian communities in California is a factor contributing to the loss of high quality fish habitat.

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## 5.3 AIR QUALITY

This section discusses the regulatory framework, regional climate, air pollution potential, and existing ambient air quality for criteria air pollutants, toxic air contaminants, odors, and dust. Information presented in this section is based in part on information gathered from the San Joaquin Valley Air Pollution Control District (SJVAPCD) and the California Air Resources Board (CARB).

### REGULATORY FRAMEWORK

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#### *FEDERAL*

#### **Clean Air Act**

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The EPA is responsible for administering the FCAA. The FCAA requires the EPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

The law recognizes the importance for each state to locally carry out the requirements of the FCAA, as special consideration of local industries, geography, housing patterns, etc. are needed to have full comprehension of the local pollution control problems. As a result, the EPA requires each state to develop a State Implementation Plan (SIP) that explains how each state will implement the FCAA within their jurisdiction. A SIP is a collection of rules and regulations that a particular state will implement to control air quality within their jurisdiction. CARB is the state agency that is responsible for preparing the California SIP.

#### **Transportation Control Measures**

One particular aspect of the SIP development process is the consideration of potential control measures as a part of making progress towards clean air goals. While most SIP control measures are aimed at reducing emissions from stationary sources, some are typically also created to address mobile or transportation sources. These are known as transportation control measures (TCMs). TCM strategies are designed to reduce vehicle miles traveled and trips, or vehicle idling and associated air pollution. These goals are achieved by developing attractive and convenient alternatives to single-occupant vehicle use. Examples of TCMs include ridesharing programs, transportation infrastructure improvements such as adding bicycle and carpool lanes, and expansion of public transit.

#### **Federal Hazardous Air Pollutant Program**

Title III of the FCAA requires the EPA to promulgate national emissions standards for hazardous air pollutants (NESHAPs). The NESHAP may differ for major sources than for area sources of HAPs (major sources are defined as stationary sources with potential to emit more than 10 tons per year [TPY] of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources). The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), the EPA

developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum available control technology (MACT). These Federal rules are also commonly referred to as MACT standards, because they reflect the Maximum Achievable Control Technology. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), the EPA is required to promulgate health risk–based emissions standards were deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards. The FCAA required the EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, §219 required the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions.

### *STATE*

#### **CARB Mobile-Source Regulation**

The State of California is responsible for controlling emissions from the operation of motor vehicles in the state. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB’s motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved. Towards this end, the CARB has adopted regulations which required auto manufacturers to phase in less polluting vehicles.

#### **California Clean Air Act**

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state’s air quality goals, planning and regulatory strategies, and performance. CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards. The San Joaquin Valley Air Pollution Control District is one of 35 air quality management districts that have prepared air quality management plans to accomplish a five percent annual reduction in emissions documenting progress toward the state ambient air quality standards.

#### **Air Quality Standards**

NAAQS are determined by the EPA. The standards include both primary and secondary ambient air quality standards. Primary standards are established with a safety margin. Secondary standards are more stringent than primary standards and are intended to protect public health and welfare. States have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards.

Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM<sub>10</sub>, and lead. In addition, California has created standards for pollutants that are not covered by federal standards. The state and federal primary standards for major pollutants are shown in Table 5.3-1.

#### **Tanner Air Toxics Act**

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure

for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs. Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. These rules and standards provide for (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low-sulfur diesel-fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide.

### **Transport of Pollutants**

The California Clean Air Act, Section 39610 (a), directs the CARB to "identify each district in which transported air pollutants from upwind areas outside the district cause or contribute to a violation of the ozone standard and to identify the district of origin of transported pollutants." The information regarding the transport of air pollutants from one basin to another was to be quantified to assist interrelated basins in the preparation of plans for the attainment of State ambient air quality standards. Numerous studies conducted by the CARB have identified air basins that are impacted by pollutants transported from other air basins (as of 1993). Among the air basins affected by air pollution transport from the SFBAAB are the North Central Coast Air Basin, the Mountain Counties Air Basin, the San Joaquin Valley Air Basin, and the Sacramento Valley Air Basin. The SFBAAB was also identified as an area impacted by the transport of air pollutants from the Sacramento region.

#### *LOCAL*

### **San Joaquin Valley Air Pollution Control District**

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is the local agency with primary responsibility for compliance with both the federal and state standards and for ensuring that air quality conditions are maintained. They do this through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The eight counties that comprise the SJVAPCD are divided into three regions. These include:

- Northern Region: Merced, San Joaquin, and Stanislaus Counties
- Central Region: Madera, Fresno, and Kings Counties
- Southern Region: Tulare and Valley portion of Kern Counties

Activities of the SJVAPCD include the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution,

issuance of permits for stationary sources of air pollution, inspection of stationary sources of air pollution and response to citizen complaints, monitoring of ambient air quality and meteorological conditions, and implementation of programs and regulations required by the FCAA and CCAA.

### *SJVAPCD RULES AND REGULATIONS*

The SJVAPCD has adopted numerous rules and regulations to implement its air quality plans. Following, are significant rules that will apply to development under the General Plan.

#### **Regulation VIII – Fugitive PM10 Prohibitions**

Regulation VIII is comprised of District Rules 8011 through 8081 which are designed to reduce PM10 emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track out, landfill operations, etc.

#### **Rule 4002 – National Emission Standards for Hazardous Air Pollutants**

Rule 4002 applies in the event an existing building will be renovated, partially demolished or removed (National Emission Standards for Hazardous Air Pollutants); this rule applies to all sources of Hazardous Air Pollutants.

#### **Rule 4102 – Nuisance**

Rule 4102 dictates that if a source operation emits or may emit air contaminants or other materials such that the emissions create a public nuisance, the owner/operator may be subject to APCD enforcement action.

#### **Rule 4103 – Open Burning**

Rule 4103 prohibits the burning of agricultural material when the land is converting from agriculture to non-agricultural (i.e. urban) purposes.

#### **Rule 4601 – Architectural Coatings**

Rule 4601 limits emissions of volatile organic compounds from architectural coatings by specifying storage, cleanup and labeling requirements.

#### **Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations**

If asphalt paving will be used, then paving operations of the proposed Project will be subject to Rule 4641. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.

#### **Rule 8021 – Construction, Demolition, Excavation, and Other Earthmoving Activities**

District Rule 8021 requires owners or operators of construction projects to submit a Dust Control Plan to the District if at any time the project involves non-residential developments of five or more acres of disturbed surface area or moving, depositing, or relocating of more than 2,500 cubic yards per day of bulk materials on at least three days of the project.

#### **Rule 9510 – Indirect Source Review**

Rule 9510 indirectly limits the vehicular emissions contribution of new development to regional air pollution. Through an application and review process, the developer may incorporate emission-reduction features in the project or may pay the fee prescribed in the rule. Fees collected by the APCD are indexed to the cost of providing offsetting mitigation and are used for that purpose.

### City of Manteca General Plan

The existing Manteca General Plan includes the following goals and policies related to air quality:

#### Air Quality Element

**GOAL AQ-1. Improve air quality by:**

- Achieving and maintaining ambient air quality standards established by the U.S. Environmental Protection Agency, the California Air Resources Board, and the San Joaquin Air Pollution Control District;
- Minimizing public exposure to toxic or hazardous air pollutants; and
- Minimizing public exposure to pollutants that create a public nuisance, such as unpleasant odors.

**GOAL AQ-2. Integrate air quality planning with land use and transportation planning processes in order to reduce vehicle miles traveled in the City and by commuters.**

**GOAL AQ-3. Increase opportunities for alternatives to internal combustion automobiles including, but not limited to, public transportation, bicycles, walking and alternative fuel vehicles including hybrid gas-electric, electric and compressed natural gas.**

**GOAL AQ-4. Reduce air emissions through energy conservation.**

**GOAL AQ-5. Reduce greenhouse gases from activities within the City by amounts needed to demonstrate consistency with State of California greenhouse gas reduction targets.**

**POLICY AQ-P-1.** Cooperate with other agencies to develop a consistent and coordinated approach to reduction of air pollution and management of hazardous air pollutants.

**POLICY AQ-P-2.** Develop a land use plan that will help to reduce the need for trips and will facilitate the common use of public transportation, walking, bicycles, and alternative fuel vehicles.

**POLICY AQ-P-3.** Segregate and provide buffers between land uses that typically generate hazardous or obnoxious fumes and residential or other sensitive land uses.

**POLICY AQ-P-4.** Develop and maintain street systems that provide for efficient traffic flow and thereby minimize air pollution from automobile emissions.

**POLICY AQ-P-5.** Develop and maintain circulation systems that provide alternatives to the automobile for transportation, including bicycles routes, pedestrian paths, bus transit, and carpooling.

**POLICY AQ-P-6.** Coordinate public transportation networks, including trains, local bus service, regional bus service and rideshare facilities to provide efficient public transit service.

**POLICY AQ-P-7.** New construction will be managed to minimize fugitive dust and construction vehicle emissions.

**POLICY AQ-P-8.** Woodburning devices shall meet current standards for controlling particulate air pollution.



## 5.0 CONSERVATION AND NATURAL RESOURCES

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**POLICY AQ-P-9.** Burning of any combustible material within the City will be controlled to minimize particulate air pollution.

**POLICY AQ-P-10.** Encourage energy efficient building designs.

**POLICY AQ-P-11.** Prepare and maintain a Climate Action Plan and community greenhouse gas emission inventory for sectors with the potential for control or influence by the City that demonstrates consistency with State of California targets.

**POLICY AQ-P-12.** Development projects shall incorporate the applicable strategies of the City of Manteca Climate Action Plan as needed to demonstrate consistency with CAP reduction targets and AB 32.

**IMPLEMENTATION AQ-I-1.** Work with the San Joaquin Valley Air Pollution Control District (APCD) to implement the Air Quality Management Plan (AQMP).

- Cooperate with the APCD to develop consistent and accurate procedures for evaluating project-specific and cumulative air quality impacts.
- Cooperate with the APCD and the California Air Resources Board in their efforts to develop a local airshed model.
- Cooperate with the APCD in their efforts to develop a cost/benefit analysis of possible control strategies (mitigation measures to minimize short and long-term stationary and area source emissions as part of the development review process, and monitoring measures to ensure that mitigation measures are implemented).

**IMPLEMENTATION AQ-I-2.** In accordance with CEQA, submit development proposals to the APCD for review and comment prior to decision.

**IMPLEMENTATION AQ-I-3.** Cooperate with the San Joaquin County Environmental Health Department in identifying hazardous material users and in developing a hazardous materials management plan.

**IMPLEMENTATION AQ-I-4.** Encourage mixed-use development that is conveniently accessible by pedestrians and public transit.

**IMPLEMENTATION AQ-I-5.** Locate employment, school, and daily shopping destinations near residential areas.

**IMPLEMENTATION AQ-I-6.** Locate higher intensity development such as multi-family housing, institutional uses, services, employment centers and retail along existing and proposed transit corridors.

**IMPLEMENTATION AQ-I-7.** Locate public facilities in areas easily served by current and planned public transportation.

**IMPLEMENTATION AQ-I-8.** Prior to entitlement of a project that may be an air pollution point source, such as a manufacturing and extracting facility, the developer shall provide documentation that the use is located and appropriately separated from residential areas and sensitive receptors (e.g., homes, schools, and hospitals).

IMPLEMENTATION AQ-I-9. Maintain acceptable traffic levels of service (LOS) as specified in the Circulation Element.

IMPLEMENTATION AQ-I-10. In new subdivisions, require the internal street system to include the installation of dedicated pedestrian/bicycle pathways connecting to adjacent residential and commercial areas as well as schools, parks and recreational areas.

IMPLEMENTATION AQ-I-11. Provide adequate pedestrian and bikeway facilities for present and future transportation needs throughout the City.

IMPLEMENTATION AQ-I-12. Construction activity plans shall include and/or provide for a dust management plan to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard.

- Project development applicants shall be responsible for ensuring that all adequate dust control measures are implemented in a timely manner during all phases of project development and construction.

IMPLEMENTATION AQ-I-13. All residences built in a new subdivision or housing development shall be equipped with conventional heating devices with sufficient capacity to heat all areas of the building without reliance on woodburning heating devices.

IMPLEMENTATION AQ-I-14. All woodburning-heating devices installed shall meet EPA standards applicable at the time of project approval.

IMPLEMENTATION AQ-I-15. Design review criteria shall include the following considerations, at a minimum:

- The developer of a sensitive air pollution receptor shall submit documentation that the project design includes appropriate buffering (e.g., setbacks, landscaping) to separate the use from highways, arterial streets, hazardous material locations and other sources of air pollution or odor.
- Promote the use of new and replacement fuel storage tanks at refueling stations that are clean fuel compatible, if technically and economically feasible.
- The use of energy efficient lighting (including controls) and process systems beyond Title 24 requirements shall be encouraged where practicable (e.g., water heating, furnaces, boiler units, etc.)
- The use of energy efficient automated controls for air conditioning beyond Title 24 requirements shall be encouraged where practicable.
- Promote solar access through building siting to maximize natural heating and cooling, and landscaping to aid passive cooling and to protect from winds.

IMPLEMENTATION AQ-I-16. Track and monitor aspects of development related to CAP strategies on an ongoing basis to measure progress in achieving CAP reduction targets.

IMPLEMENTATION AQ-I-17. Track implementation of municipal and community projects and programs related to energy efficiency, transit service improvements, transportation facilities

such as bicycle paths and lanes, pedestrian infrastructure, and other projects that reduce greenhouse gas emissions throughout the community.

IMPLEMENTATION AQ-I-18. Update CAP emission inventories, targets, and strategies to reflect new State of California greenhouse gas reduction targets when adopted for later years and to reflect the benefits of any new State and federal regulatory actions that reduce greenhouse gas emissions to demonstrate continued consistency with State targets.

### ENVIRONMENTAL SETTING

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#### **San Joaquin Valley Air Basin (SJVAB)**

The San Joaquin Valley Air Basin (SJVAB) consists of eight counties, stretching from Kern County in the south to San Joaquin County in the north. The SJVAB is bounded by the Sierra Nevada in the east, the Coast Ranges in the west, and the Tehachapi mountains in the south.

The surrounding topographic features restrict air movement through and out of the basin and, as a result, impede the dispersion of pollutants from the basin. Inversion layers are formed in the SJVAB throughout the year. (An inversion layer is created when a mass of warm dry air sits over cooler air near the ground, preventing vertical dispersion of pollutants from the air mass below). During the summer, the San Joaquin Valley experiences daytime temperature inversions at elevations from 2,000 to 2,500 feet above the valley floor. During the winter months, inversions occur from 500 to 1,000 feet above the valley floor (SJVAPCD, 2002).

The pollution potential of the San Joaquin Valley is very high. Surrounding elevated terrain in conjunction with temperature inversions frequently restrict lateral and vertical dilution of pollutants. Abundant sunshine and warm temperatures in summer are ideal conditions for the formation of photochemical oxidant, and the Valley is a frequent scene of photochemical pollution.

#### **Climate**

The SJVAB has an inland Mediterranean climate with warm, dry summers and cooler winters. The average daily maximum temperature in the Basin is 65 degrees Fahrenheit (°F), with average temperature highs of 95 °F in July. Average daily minimum temperature is 48 °F, with average temperature lows of 45 °F in January. Normal rainfall level is approximately 9 inches per year, and occurs mainly in the winter months from November to April. Thunderstorms occur on approximately three to four days in the spring, on average.

San Joaquin County has warm, dry days and relatively cool nights, with clear skies and limited rainfall. Winters are mild with light rains and frequent heavy fog from December to January.

In summer, high temperatures often exceed 100 degrees, with averages in the low 90's in the northern valley and the high 90's in the southern valley. Summer low temperatures average in the high 50's in the northern valley and the upper 60's in the southern valley. The northern end of the Valley (Manteca and Stockton area) receives approximately 20 inches of rain per year. The central portion of the Valley (Fresno area) receives approximately 10 inches of rain per year. The southern end of the Valley (Bakersfield area) receives less than 6 inches of rain per year.

### **Air Movement**

Marine air comes into the basin from the Sacramento River–San Joaquin River Delta, although most air movement is restricted by the surrounding mountains. Winds from the Bay Area flow northeasterly into the Sacramento Valley and southward into San Joaquin County. This results in weak winds from the north and northeast, with an average speed of seven miles per hour.

Wind speed and direction determine the dispersion of air pollutants. During the summer, wind from the north flows south and southeasterly through the Valley, through the Tehachapi Pass and into the Southeast Desert Air Basin. Thus, emissions from the San Francisco Bay Area and the Broader Sacramento air basins are transported into San Joaquin County and the Valley. Emissions in the San Joaquin Valley are then transported to the Southeast Desert and Great Basin Valley Air Basins. In late fall and winter, cold air from the mountains flows into the Valley. This results in winds from the south that flow north and northwesterly. Some emissions from San Joaquin County are transported to the Broader Sacramento air basin during these times. But the winds are relatively light, limiting the dispersion of CO and other pollutants. Thus, high concentrations of CO remain in the Valley.

### **Seasonal Pollution Variations**

Carbon monoxide, oxides of nitrogen, particulate matter, and lead particulate concentrations are highest in the late fall and winter when there is little interchange of air between the valley and the coast and when humidity is high following winter rains. This type of weather is associated with radiation fog, known as tule fog, when temperature inversions at ground level persist over the entire valley for several weeks and air movement is virtually absent.

Pollution potential in the San Joaquin County area is relatively high due to the combination of air pollutant emissions sources, transport of pollutants into the area and meteorological conditions that are conducive to high levels of air pollution. Elevated levels of particulate matter (primarily very small particulates or PM<sub>10</sub>) and ground-level ozone are of most concern to regional air quality officials.

Local carbon monoxide “hot spots” are important to a lesser extent. Ground-level ozone, the principal component of smog, is not directly emitted into the atmosphere but is formed by the reaction of reactive organic gases (ROG) and nitrogen oxides (NO<sub>x</sub>) (known as ozone precursor pollutants) in the presence of strong sunlight. Ozone levels are highest in San Joaquin County during late spring through early fall, when weather conditions are conducive and emissions of the precursor pollutants are highest.

Surface-based inversions that form during late fall and winter nights cause localized air pollution problems (PM<sub>10</sub> and carbon monoxide) near the emission sources because of poor dispersion conditions. Emission sources are primarily from automobiles. Conditions are exacerbated during drought-year winters.

### **Sunlight**

The presence and intensity of sunlight are necessary prerequisites for the formation of photochemical smog. Under the influence of the ultraviolet radiation of sunlight, certain original or “primary” pollutants (mainly reactive hydrocarbons and oxides of nitrogen) react to form “secondary” pollutants (primarily oxidants). Since this process is time dependent, secondary pollutants can be formed many miles downwind from the emission sources. Because of the prevailing daytime winds and time delayed nature of photochemical smog, oxidant concentrations are highest in the inland areas of the San Joaquin Valley.

### Temperature Inversions

A temperature inversion is a reversal in the normal decrease of temperature as altitude increases. In most parts of the country, air near ground level is warmer than the air above it. Semi-permanent systems of high barometric pressure fronts establish themselves over the basin, deflecting low-pressure systems that might otherwise bring cleansing rain and winds. The height of the base of the inversion is known as the "mixing height" and controls the volume of air available for the mixing and dispersion of air pollutants.

The interrelationship of air pollutants and climatic factors are most critical on days of greatly reduced atmospheric ventilation. On days such as these, air pollutants accumulate because of the simultaneous occurrence of three favorable factors: low inversions, low maximum mixing heights and low wind speeds. Although these conditions may occur throughout the year, the months of July, August and September generally account for more than 40 percent of these occurrences.

The potential for high contaminant levels varies seasonally for many contaminants. During late spring, summer, and early fall, light winds, low mixing heights, and sunshine combine to produce conditions favorable for the maximum production of oxidants, mainly ozone. When strong surface inversions are formed on winter nights, especially during the hours before sunrise, coupled with near-calm winds, carbon monoxide from automobile exhausts becomes highly concentrated. The highest yearly concentrations of carbon monoxide and oxides of nitrogen are measured during November, December and January.

## CRITERIA AIR POLLUTANTS AND EXISTING AMBIENT AIR QUALITY

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### Criteria Pollutants

The United States Environmental Protection Agency (EPA) uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). Each criteria pollutant is described below.

**Ozone (O<sub>3</sub>)** is a photochemical oxidant and the major component of smog. While O<sub>3</sub> in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O<sub>3</sub> at ground level are a major health and environmental concern. O<sub>3</sub> is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak O<sub>3</sub> levels occur typically during the warmer times of the year. Both VOCs and NO<sub>x</sub> are emitted by transportation and industrial sources. VOCs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops, and other sources using solvents.

The reactivity of O<sub>3</sub> causes health problems because it damages lung tissue, reduces lung function and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O<sub>3</sub> not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O<sub>3</sub> for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

**Carbon monoxide (CO)** is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease, particularly those with angina or peripheral vascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability, and performance of complex tasks.

**Nitrogen dioxide (NO<sub>2</sub>)** is a brownish, highly reactive gas that is present in all urban atmospheres. NO<sub>2</sub> can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to O<sub>3</sub> and acid rain, and may affect both terrestrial and aquatic ecosystems. The major mechanism for the formation of NO<sub>2</sub> in the atmosphere is the oxidation of the primary air pollutant NO<sub>x</sub>. NO<sub>x</sub> plays a major role, together with VOCs, in the atmospheric reactions that produce O<sub>3</sub>. NO<sub>x</sub> forms when fuel is burned at high temperatures. The two major emission sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

**Sulfur dioxide (SO<sub>2</sub>)** affects breathing and may aggravate existing respiratory and cardiovascular disease in high doses. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children, and the elderly. SO<sub>2</sub> is also a primary contributor to acid deposition, or acid rain, which causes acidification of lakes and streams and can damage trees, crops, historic buildings, and statues. In addition, sulfur compounds in the air contribute to visibility impairment in large parts of the country. This is especially noticeable in national parks. Ambient SO<sub>2</sub> results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills, and from nonferrous smelters.

**Particulate matter (PM)** includes dust, dirt, soot, smoke, and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO<sub>2</sub> and VOCs are also considered particulate matter.

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO<sub>2</sub>) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis, and premature death.

**Respirable particulate matter (PM<sub>10</sub>)** consists of small particles, less than 10 microns in diameter, of dust, smoke, or droplets of liquid which penetrate the human respiratory system and cause irritation by themselves, or in combination with other gases. Particulate matter is caused primarily by dust from grading and excavation activities, from agricultural uses (as created by soil preparation activities, fertilizer and pesticide spraying, weed burning, and animal husbandry), and from motor vehicles, particularly diesel-powered vehicles. PM<sub>10</sub> causes a greater health risk than larger particles, since these small particles can more easily penetrate the defenses of the human respiratory system.

**Fine particulate matter (PM<sub>2.5</sub>)** consists of small particles, which are less than 2.5 microns in size. Similar to PM<sub>10</sub>, these particles are primarily the result of combustion in motor vehicles, particularly diesel engines, as well as from industrial sources and residential/agricultural activities such as burning. It is also formed through the reaction of other pollutants. As with PM<sub>10</sub>, these particulates can increase the chance of respiratory disease, and cause lung damage and cancer. In 1997, the EPA created new Federal air quality standards for PM<sub>2.5</sub>.

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The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly, and children. Particulate matter also soils and damages materials, and is a major cause of visibility impairment.

**Lead (Pb)** exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil, or dust. Excessive Pb exposure can cause seizures, mental retardation, and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and subsequent heart disease.

### **Odors**

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

### **Sensitive Receptors**

A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include residences, hospitals, and schools.

### **Ambient Air Quality**

Both the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant.

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The federal and California state ambient air quality standards are summarized in Table 5.3-1 for important pollutants. The federal and state ambient standards were developed independently, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and particulate matter between 2.5 and 10 microns in diameter (PM<sub>10</sub>).

**TABLE 5.3-1: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS**

POLLUTANT	AVERAGING TIME	FEDERAL PRIMARY STANDARD	STATE STANDARD
Ozone	1-Hour	--	0.09 ppm
	8-Hour	0.075 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.03 ppm
	1-Hour	0.100 ppm	0.18 ppm
Sulfur Dioxide	Annual	0.03 ppm	--
	24-Hour	0.14 ppm	0.04 ppm
	1-Hour	75 ppb	0.25 ppm
PM <sub>10</sub>	Annual	--	20 µg / m <sup>3</sup>
	24-Hour	150 µg / m <sup>3</sup>	50 µg / m <sup>3</sup>
PM <sub>2.5</sub>	Annual	12 µg / m <sup>3</sup>	12 µg / m <sup>3</sup>
	24-Hour	35 µg / m <sup>3</sup>	--
Lead	30-Day Average	--	1.5 µg / m <sup>3</sup>
	3-Month Average	0.15 µg / m <sup>3</sup>	--

NOTES: PPM = PARTS PER MILLION, µG/M<sup>3</sup> = MICROGRAMS PER CUBIC METER

SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2013.

In 1997, new national standards for fine particulate matter diameter 2.5 microns or less (PM<sub>2.5</sub>) were adopted for 24-hour and annual averaging periods. The current PM<sub>10</sub> standards were to be retained, but the method and form for determining compliance with the standards were revised.

The State of California regularly reviews scientific literature regarding the health effects and exposure to PM and other pollutants. On May 3, 2002, CARB staff recommended lowering the level of the annual standard for PM<sub>10</sub> and establishing a new annual standard for PM<sub>2.5</sub>. The new standards became effective on July 5, 2003, with another revision on November 29, 2005.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Existing air quality concerns within San Joaquin County and the entire SJVAB are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles which account for 70 percent of the ozone in the region. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.



### Attainment Status

In accordance with the California Clean Air Act (CCAA), the CARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to applicable standards. An “attainment” designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A “nonattainment” designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria.

Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An “unclassified” designation signifies that the data do not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. EPA designates areas for ozone (O<sub>3</sub>), carbon monoxide (CO), and nitrogen dioxide (NO<sub>2</sub>) as “does not meet the primary standards,” “cannot be classified,” or “better than national standards.” For sulfur dioxide (SO<sub>2</sub>), areas are designated as “does not meet the primary standards,” “does not meet the secondary standards,” “cannot be classified,” or “better than national standards.” However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

San Joaquin County has a state designation of Nonattainment for Ozone, PM<sub>10</sub>, and PM<sub>2.5</sub> and is either Unclassified or Attainment for all other criteria pollutants. The County has a national designation of Nonattainment for ozone and PM<sub>2.5</sub>. The County is designated either attainment or unclassified for the remaining national standards. Table 5.3-2 presents the state and nation attainment status for San Joaquin County.

**TABLE 5.3-2: STATE AND NATIONAL ATTAINMENT STATUS**

<i>CRITERIA POLLUTANTS</i>	<i>STATE DESIGNATIONS</i>	<i>NATIONAL DESIGNATIONS</i>
Ozone	Nonattainment	Nonattainment
PM <sub>10</sub>	Nonattainment	Attainment
PM <sub>2.5</sub>	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified
Sulfates	Attainment	--
Lead	Attainment	--
Hydrogen Sulfide	Unclassified	--
Visibility Reducing Particles	Unclassified	--

*SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2013.*

### San Joaquin Valley Air Basin Monitoring

The SJVAB consists of eight counties, from San Joaquin County in the north to Kern County in the south. SJVAPCD and CARB maintain numerous air quality monitoring sites throughout each County in the Air Basin to measure ozone, PM<sub>2.5</sub>, and PM<sub>10</sub>. It is important to note that the federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for federal standards. Data obtained from the monitoring sites throughout the SJVAB between 2013 and 2015 is summarized in Tables 5.3-3 through 5.3-5.

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**TABLE 5.3-3: SJVAB AMBIENT AIR QUALITY MONITORING DATA SUMMARY - OZONE**

YEAR	DAYS > STANDARD				1-HOUR OBSERVATIONS			8-HOUR AVERAGES				YEAR COVERAGE	
	STATE		NATIONAL		MAX.	STATE	NAT'L	STATE		NATIONAL			
	1-Hr	8-Hr	1-Hr	'08 8-Hr		D.V. <sup>1</sup>	D.V. <sup>2</sup>	MAX.	D.V. <sup>1</sup>	MAX.	'08 D.V. <sup>2</sup>	MIN	MAX
2015	45	99	1	80	0.135	0.12	0.116	0.110	0.104	0.110	0.093	61	99
2014	48	128	1	86	0.128	0.12	0.118	0.105	0.108	0.104	0.095	83	100
2013	41	112	0	89	0.123	0.14	0.127	0.106	0.116	0.106	0.094	53	100

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. THE NATIONAL 1-HOUR OZONE STANDARD WAS REVOKED IN JUNE 2005 AND IS NO LONGER IN EFFECT. STATISTICS RELATED TO THE REVOKED STANDARD ARE SHOWN IN ITALICS. D.V.<sup>1</sup> = STATE DESIGNATION VALUE. D.V.<sup>2</sup> = NATIONAL DESIGN VALUE.

SOURCE: CALIFORNIA AIR RESOURCES BOARD (AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM OR IADAM) AIR POLLUTION SUMMARIES.

**TABLE 5.3-4: SJVAB AMBIENT AIR QUALITY MONITORING DATA SUMMARY - PM<sub>2.5</sub>**

YEAR	EST. DAYS > NAT'L '06 STD.	ANNUAL AVERAGE		NAT'L ANN. STD. D.V. <sup>1</sup>	STATE ANNUAL D.V. <sup>2</sup>	NAT'L '06 STD. 98TH PERCENTILE	NAT'L '06 24-Hr STD. D.V. <sup>1</sup>	HIGH 24-HOUR AVERAGE		YEAR COVERAGE	
		NAT'L	STATE					NAT'L	STATE	MIN.	MAX.
2015	38.0	17.9	17.9	20.8	19	99.2	77	107.8	111.9	16	100
2014	40.4	21.6	18.6	19.7	19	107.2	71	107.2	107.2	32	100
2013	50.4	22.8	18.7	18.1	19	96.7	65	167.3	167.3	87	100

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. D.V.<sup>1</sup> = STATE DESIGNATION VALUE. D.V.<sup>2</sup> = NATIONAL DESIGN VALUE

SOURCE: CALIFORNIA AIR RESOURCES BOARD (AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM OR IADAM) AIR POLLUTION SUMMARIES.

**TABLE 5.3-5: SJVAB AMBIENT AIR QUALITY MONITORING DATA SUMMARY - PM<sub>10</sub>**

YEAR	EST. DAYS > STD.		ANNUAL AVERAGE		3-YEAR AVERAGE		HIGH 24-Hr AVERAGE		YEAR COVERAGE
	NAT'L	STATE	NAT'L	STATE	NAT'L	STATE	NAT'L	STATE	
2015	*	*	66.3	*	*	48	124.6	104.4	77
2014	8.4	138.8	57.9	47.5	45	48	430.1	419.5	100
2013	3.8	122.3	65.2	45.6	44	46	224.2	183.6	100

NOTES: THE NATIONAL ANNUAL AVERAGE PM<sub>10</sub> STANDARD WAS REVOKED IN DECEMBER 2006 AND IS NO LONGER IN EFFECT. AN EXCEEDANCE IS NOT NECESSARILY A VIOLATION. STATISTICS MAY INCLUDE DATA THAT ARE RELATED TO AN EXCEPTIONAL EVENT. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. NATIONAL STATISTICS ARE BASED ON STANDARD CONDITIONS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. \* = THERE WAS INSUFFICIENT (OR NO) DATA AVAILABLE TO DETERMINE THE VALUE.

SOURCE: CALIFORNIA AIR RESOURCES BOARD (AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM OR IADAM) AIR POLLUTION SUMMARIES.

### San Joaquin County Air Quality Monitoring

SJVAPCD and CARB maintain two air quality monitoring sites in San Joaquin County that collect data for ozone, PM<sub>10</sub>, and PM<sub>2.5</sub>. These include the Stockton - Hazelton Street and Tracy – Airport monitoring sites. The federal ozone 1-hour standard was revoked by the EPA in 2005, but subsequent litigation reinstated portions of implementation requirements under the revoked standard. As a result, the

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SJVAPCD adopted the 2013 Plan for the Revoked 1-Hour Ozone Standard in September 2013 to address the reinstated requirements for this standard. Data obtained from the monitoring sites between 2013 and 2015 is shown in Tables 5.3-6 and 5.3-7.

**TABLE 5.3-6: AMBIENT AIR QUALITY MONITORING DATA (STOCKTON – HAZELTON STREET)**

POLLUTANT	CAL.	FED.	YEAR	MAX CONCENTRATION	DAYS EXCEEDED STATE/FED STANDARD
	PRIMARY STANDARD				
Ozone (O <sub>3</sub> ) (1-hour)	0.09 ppm for 1 hour	NA	2015	0.094	0 / (N/A)
			2014	0.090	0 / (N/A)
			2013	0.080	0 / (N/A)
Ozone (O <sub>3</sub> ) (8-hour)	0.07 ppm for 8 hour	0.075 ppm for 8 hour	2015	0.079	3 / 1
			2014	0.078	5 / 1
			2013	0.067	0 / 0
Particulate Matter (PM <sub>10</sub> )	50 ug/m3 for 24 hours	150 ug/m3 for 24 hours	2015	55.3	* / *
			2014	94.0	18.0 / 0
			2013	95.5	58.2 / 0
Fine Particulate Matter (PM <sub>2.5</sub> )	No 24 hour State Standard	35 ug/m3 for 24 hours	2015	58.8	(N/A) / *
			2014	56.8	(N/A) / 16.0
			2013	66.5	(N/A) / 27.6

SOURCE: CALIFORNIA AIR RESOURCES BOARD (AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM OR IADAM) AIR POLLUTION SUMMARIES.

**TABLE 5.3-7: AMBIENT AIR QUALITY MONITORING DATA (TRACY – AIRPORT)**

POLLUTANT	CAL.	FED.	YEAR	MAX CONCENTRATION	DAYS EXCEEDED STATE/FED STANDARD
	PRIMARY STANDARD				
Ozone (O <sub>3</sub> ) (1-hour)	0.09 ppm for 1 hour	NA	2015	0.107	4 / (N/A)
			2014	0.097	1 / (N/A)
			2013	0.096	1 / (N/A)
Ozone (O <sub>3</sub> ) (8-hour)	0.07 ppm for 8 hour	0.075 ppm for 8 hour	2015	0.091	21 / 5
			2014	0.098	17 / 8
			2013	0.098	5 / 2
Particulate Matter (PM <sub>10</sub> )	50 ug/m3 for 24 hours	150 ug/m3 for 24 hours	2015	58.3	* / *
			2014	67.7	* / 0.0
			2013	73.2	* / 0.0
Fine Particulate Matter (PM <sub>2.5</sub> )	No 24 hour State Standard	35 ug/m3 for 24 hours	2015	39.0	* / *
			2014	36.8	* / *
			2013	56.3	* / *

SOURCE: CALIFORNIA AIR RESOURCES BOARD (AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM OR IADAM) AIR POLLUTION SUMMARIES.

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## 5.4 GREENHOUSE GASES AND CLIMATE CHANGE

### Greenhouse Gases and Climate Change Linkages

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Naturally occurring greenhouse gases include water vapor (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and ozone (O<sub>3</sub>). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also greenhouse gases, but they are, for the most part, solely a product of industrial activities. Although the direct greenhouse gases CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2011, concentrations of these three greenhouse gases have increased globally by 40, 150, and 20 percent, respectively (IPCC, 2013).

Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), ozone (O<sub>3</sub>), water vapor, nitrous oxide (N<sub>2</sub>O), and chlorofluorocarbons (CFCs).

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. In California, the transportation sector is the largest emitter of GHGs, followed by the industrial and electricity generation sectors (California Energy Commission, 2016).

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California produced 441.5 million gross metric tons of carbon dioxide equivalents (MMTCO<sub>2</sub>e) in 2014 (California Air Resources Board, 2016). By 2020, under business as usual conditions, California is projected to produce 509 MMTCO<sub>2</sub>e per year (California Air Resources Board, 2014).

Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO<sub>2</sub> were being emitted.

Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2014, accounting for 37% of total GHG emissions in the state. This category was followed by the industrial sector (24%) and the electricity generation sector (20%) (California Air Resources Board, 2016).

### **Effects of Global Climate Change**

Global climate change has already had observable effects on the environment. Glaciers have shrunk, ice on rivers and lakes is breaking up earlier, plant and animal ranges have shifted and trees are flowering sooner. Effects that scientists had predicted in the past would result from global climate change are now occurring: loss of sea ice, accelerated sea level rise and longer, more intense heat waves are being observed.

Scientists have high confidence that global temperatures will continue to rise for decades to come, largely due to greenhouse gases produced by human activities. The Intergovernmental Panel on Climate Change (IPCC), which includes more than 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5 to 10 degrees Fahrenheit over the next century. Regional variations of the effects of climate change vary greatly. According to the IPCC, the extent of climate change effects on individual regions will vary over time and with the ability of different societal and environmental systems to mitigate or adapt to change. The IPCC predicts that increases in global mean temperature of less than 1.8 to 5.4 degrees Fahrenheit (1 to 3 degrees Celsius) above 1990 levels will produce beneficial impacts in some regions and harmful ones in others.

Sectors affected by climate changes include agriculture, water, human health, energy, transportation, forests, and ecosystems. Climate change poses a major challenge to U.S. agriculture because of the critical dependence of agricultural systems on climate. Climate change has the potential to both positively and negatively affect the location, timing, and productivity of crop, livestock, and fishery systems at local, national, and global scales. The United States produces nearly \$330 billion per year in agricultural commodities. This productivity is vulnerable to direct impacts on crops and livestock from changing climate conditions and extreme weather events and indirect impacts through increasing pressures from pests and pathogens. Climate change will also alter the stability of food supplies and create new food security challenges for the United States as the world seeks to feed nine billion people by 2050. While the agriculture sector has proven to be adaptable to a range of stresses, as evidenced by continued growth in production and efficiency across the United States, climate change poses a new set of challenges.

Water quality and quantity are being affected by climate change. Changes in precipitation and runoff, combined with changes in consumption and withdrawal, have reduced surface and groundwater supplies in many areas. These trends are expected to continue, increasing the likelihood of water shortages for many uses. Water quality is also diminishing in many areas, particularly due to sediment and contaminant concentrations after heavy downpours. Sea level rise, storms and storm surges, and changes in surface and groundwater use patterns are expected to compromise the sustainability of coastal freshwater aquifers and wetlands. In most U.S. regions, water resources managers and planners will encounter new risks, vulnerabilities, and opportunities that may not be properly managed with existing practices.

Climate change affects human health in many ways. For example, increasingly frequent and intense heat events lead to more heat-related illnesses and deaths and, over time, worsen drought and wildfire risks, and intensify air pollution. Increasingly frequent extreme precipitation and associated flooding can lead to injuries and increases in waterborne disease. Rising sea surface temperatures have been linked with increasing levels and ranges of diseases. Rising sea levels intensify coastal flooding and storm surge, and thus exacerbate threats to public safety during storms. Certain groups of people are more vulnerable to the range of climate change related health impacts, including the elderly, children, the poor, and the sick. Others are vulnerable because of where they live, including those in floodplains, coastal zones, and

some urban areas. Improving and properly supporting the public health infrastructure will be critical to managing the potential health impacts of climate change.

Climate change also affects the living world, including people, through changes in ecosystems and biodiversity. Ecosystems provide a rich array of benefits and services to humanity, including habitat for fish and wildlife, drinking water storage and filtration, fertile soils for growing crops, buffering against a range of stressors including climate change impacts, and aesthetic and cultural values. These benefits are not always easy to quantify, but they support jobs, economic growth, health, and human well-being. Climate change driven disruptions to ecosystems have direct and indirect human impacts, including reduced water supply and quality, the loss of iconic species and landscapes, effects on food chains and the timing and success of species migrations, and the potential for extreme weather and climate events to destroy or degrade the ability of ecosystems to provide societal benefits.

Human modifications of ecosystems and landscapes often increase their vulnerability to damage from extreme weather events, while simultaneously reducing their natural capacity to moderate the impacts of such events. For example, salt marshes, reefs, mangrove forests, and barrier islands defend coastal ecosystems and infrastructure, such as roads and buildings, against storm surges. The loss of these natural buffers due to coastal development, erosion, and sea level rise increases the risk of catastrophic damage during or after extreme weather events. Although floodplain wetlands are greatly reduced from their historical extent, those that remain still absorb floodwaters and reduce the effects of high flows on river-margin lands. Extreme weather events that produce sudden increases in water flow, often carrying debris and pollutants, can decrease the natural capacity of ecosystems to cleanse contaminants.

In an August 2016 report *“What Climate Change Means for California”* the United States Environmental Protection Agency summarized the effects of climate change on California which include the following impacts:

**Snowpack:** As the climate warms, less precipitation falls as snow, and more snow melts during the winter. That decreases snowpack—the amount of snow that accumulates over the winter. Since the 1950s, the snowpack has declined in California and the nearby states that drain into the Colorado River. A diminishing snowpack may shift the tree line, as mountain hemlock and other high-altitude trees become able to grow at higher elevations. A higher tree line would decrease the extent of alpine tundra ecosystems, which could threaten some species.

**Water Availability:** The changing climate is likely to increase the need for water but reduce the supply. Rising temperatures increase the rate at which water evaporates into the air from soils and surface waters. Rising temperatures also increase the rate at which plants transpire water into the air to keep cool, so irrigated farmland would need more water. But less water is likely to be available, because precipitation is unlikely to increase as much as evaporation. Soils are likely to be drier, and periods without rain are likely to become longer, making droughts more severe. The decline in snowpack could further limit the supply of water for some purposes. Mountain snowpacks are natural reservoirs. They collect the snow that falls during winter and release water when the snow melts during spring and summer. Over the past 50 years, snowpack has been melting earlier in the year. Dams capture most meltwater and retain it for use later in the year. But upstream of these reservoirs, less water is available during droughts for ecosystems, fish, water-based recreation, and landowners who draw water directly from a flowing river.

**Agriculture:** About 90 percent of crops harvested in California are grown on farms that are entirely irrigated, so a sustained decrease in the amount of water available for irrigation would force farmers to

either reduce the acreage under cultivation or shift away from the most water-intensive crops. But even if sufficient water is available, rising temperatures could transform California’s agriculture. Fruit trees and grape vines need a certain number of “chilling hours” during which temperatures are between 32° and 50°F in the winter before they can flower. Suitable areas for growing wine grapes are likely to shift north, and the area capable of consistently producing grapes for the highest-quality wines is likely to shrink by more than 50 percent during the next 75 years. Chilling will be insufficient in much of California for the types of fruit trees found in the state today. The yields of most grain crops currently grown in the state are likely to decline as well. Livestock may also be affected: higher temperatures cause cows to eat less, grow more slowly, and produce less milk, and in extreme cases, it may threaten their health.

**Wildfires and Changing Landscapes:** Higher temperatures and drought are likely to increase the severity, frequency, and extent of wildfires, which could harm property, livelihoods, and human health. On average, 4 percent of the land in California has burned per decade since 1984. In 2003, the Old, Grand Prix, and Padua wildfires destroyed 800 homes in southern California, forced 100,000 residents to be evacuated, and cost \$1.3 billion. Wildfire smoke can reduce air quality and increase medical visits for chest pains, respiratory problems, and heart problems. The combination of more fires and drier conditions may expand deserts and otherwise change parts of California’s landscape. Many plants and animals living in arid lands are already near the limits of what they can tolerate. A warmer and drier climate would generally expand the geographic ranges of the Sonoran, Mojave, and Great Basin deserts. In some cases, native vegetation may persist and delay or prevent expansion of the desert. In other cases, fires or livestock grazing may accelerate the conversion of grassland to desert in response to a changing climate. For similar reasons, some forests may change to desert or grassland.

**Human Health:** Hot days can be unhealthy—even dangerous. Certain people are especially vulnerable, including children, the elderly, the sick, and the poor. High air temperatures can cause heat stroke and dehydration, and affect people’s cardiovascular, respiratory, and nervous systems. Higher temperatures are amplified in urban settings where paved and other surfaces tend to store heat. Warming can also increase the formation of ground-level ozone, a component of smog that can contribute to respiratory problems. EPA and the California Air Resources Board have been working to reduce ozone concentrations. As the climate changes, continued progress toward clean air will be more difficult.

**Sea Level Rise:** Sea level is likely to rise between one and four feet in the next century. Even a 16-inch rise could threaten coastal highways, bridges, and the San Francisco and Oakland airports. A rise of three feet would increase the number of Californians living in places that are flooded by a 100-year storm from about 250,000 today to about 400,000. Along some ocean shores, homes will fall into the water as beaches, bluffs, and cliffs erode; but along shores where seawalls protect shorefront homes from erosion, beaches may erode up to the seawall and then vanish. The sea could also submerge wetlands in San Francisco Bay and other estuaries, which would harm local fisheries and potentially remove key intertidal feeding habitat for migratory birds, lead to additional salt water intrusion of freshwater resources, and increase flooding potential.

### **Energy Consumption**

Energy in California is consumed from a wide variety of sources. Fossil fuels (including gasoline and diesel fuel, natural gas, and energy used to generate electricity) are most widely used form of energy in the State. However, renewable source of energy (such as solar and wind) are growing in proportion to California’s overall energy mix. A large driver of renewable sources of energy in California is the State’s

current Renewable Portfolio Standard (RPS), which requires the State to derive at least 33% of electricity generated from renewable resources by 2020, and 50 percent by 2030.

Overall, in 2013, California ranked as the third-most energy efficient state in the nation (U.S. EIA, 2016). California's per capita rate of energy usage has remained relatively constant since the 1970's. Many State regulations since the 1970's, including new building energy efficiency standards, vehicle fleet efficiency measures, as well as growing public awareness, have helped to keep per capita energy usage in the State in check.

The consumption of nonrenewable energy (primarily gasoline and diesel fuel) associated with the operation of passenger, public transit, and commercial vehicles results in GHG emissions that ultimately result in global climate change. Alternative fuels such as natural gas, ethanol, and electricity (unless derived from solar, wind, nuclear, or other energy sources that do not produce carbon emissions) also result in GHG emissions and contribute to global climate change.

**Electricity Consumption:** California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. Approximately 71 percent of the electrical power needed to meet California's demand is produced in the state. Approximately 29 percent of its electricity demand is imported from the Pacific Northwest and the Southwest (California Energy Commission, 2012)<sup>1</sup>. In 2010, California's in-state generated electricity was derived from natural gas (53.4 percent), large hydroelectric resources (14.6 percent), coal (1.7 percent), nuclear sources (15.7 percent), and renewable resources that include geothermal, biomass, small hydroelectric resources, wind, and solar (14.6 percent) (California Energy Commission, 2012).

According to the California Energy Commission (CEC), total statewide electricity consumption increased from 166,979 gigawatt-hours (GWh) in 1980 to 228,038 GWh in 1990, which is an estimated annual growth rate of 3.66 percent. The statewide electricity consumption in 1997 was 246,225 GWh, reflecting an annual growth rate of 1.14 percent between 1990 and 1997 (California Energy Commission Energy Almanac, 2012). Statewide consumption was 274,985 GWh in 2010, an annual growth rate of 0.9 percent between 1997 and 2010.

**Oil:** The primary energy source for the United States is oil, which is refined to produce fuels like gasoline, diesel, and jet fuel. Oil is a finite, nonrenewable energy source. World consumption of petroleum products has grown steadily in the last several decades. As of 2009, world consumption of oil had reached 96 million barrels per day. The United States, with approximately five percent of the world's population, accounts for approximately 19 percent of world oil consumption, or approximately 18.6 million barrels per day (The World Factbook 2009, Washington, DC: Central Intelligence Agency, 2009). The transportation sector relies heavily on oil. In California, petroleum based fuels currently provide approximately 96 percent of the state's transportation energy needs (California Energy Commission, 2012).

**Natural Gas/Propane:** The state produces approximately 12 percent of its natural gas, while obtaining 22 percent from Canada and 65 percent from the Rockies and the Southwest (California Energy Commission, 2012). In 2006, California produced 325.6 billion cubic feet of natural gas (California Energy Commission, 2012).

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1 California Energy Commission (2012). Energy Almanac. Retrieved August 2012, from <http://energyalmanac.ca.gov/overview/index.html>



### REGULATORY FRAMEWORK

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#### *FEDERAL*

#### **Federal Climate Change Policy**

According to the EPA, “the United States government has established a comprehensive policy to address climate change” that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, “the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science.” The Federal government’s goal is to reduce the greenhouse gas (GHG) intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the EPA administers multiple programs that encourage voluntary GHG reductions, including “ENERGY STAR,” “Climate Leaders,” and Methane Voluntary Programs. However, as of this writing, there are no adopted Federal plans, policies, regulations, or laws directly regulating GHG emissions.

#### **Energy Policy Act of 2005**

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a Federal purchase requirement for renewable energy.

#### *STATE*

#### **Assembly Bill 1493**

In response to AB 1493, CARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California’s existing motor vehicle emission standards. Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961), and adoption of Section 1961.1 (CCR 13 1961.1) require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016. For passenger cars and light-duty trucks 3,750 pounds or less loaded vehicle weight (LVW), the 2016 GHG emission limits are approximately 37 percent lower than during the first year of the regulations in 2009. For medium-duty passenger vehicles and light-duty trucks 3,751 LVW to 8,500 pounds gross vehicle weight, GHG emissions are reduced approximately 24 percent between 2009 and 2016.

CARB requested a waiver of federal preemption of California’s Greenhouse Gas Emissions Standards. The intent of the waiver is to allow California to enact emissions standards to reduce carbon dioxide and other greenhouse gas emissions from automobiles in accordance with the regulation amendments to the CCRs that fulfill the requirements of AB 1493. The EPA granted a waiver to California to implement its greenhouse gas emissions standards for cars.

#### **Assembly Bill 1007**

Assembly Bill 1007, (Pavley, Chapter 371, Statutes of 2005) directed the CEC to prepare a plan to increase the use of alternative fuels in California. As a result, the CEC prepared the State Alternative

Fuels Plan in consultation with the state, federal, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assessed various alternative fuels and developed fuel portfolios to meet California’s goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

**Bioenergy Action Plan – Executive Order #S-06-06**

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The executive order also calls for the state to meet a target for use of biomass electricity.

**California Executive Orders S-3-05 and S-20-06, and Assembly Bill 32**

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California’s GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80% below the 1990 levels by the year 2050.

In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.” Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state’s Climate Action Team.

**EO S-13-08**

EO S-13-08 was issued on November 14, 2008. The EO is intended to hasten California’s response to the impacts of global climate change, particularly sea level rise, and directs state agencies to take specified actions to assess and plan for such impacts, including requesting the National Academy of Sciences to prepare a Sea Level Rise Assessment Report, directing the Business, Transportation, and Housing Agency to assess the vulnerability of the State’s transportation systems to sea level rise, and requiring the Office of Planning and Research and the Natural Resources Agency to provide land use planning guidance related to sea level rise and other climate change impacts.

The order also required State agencies to develop adaptation strategies to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. The adaption strategies report summarizes key climate change impacts to the State for the following areas: public health; ocean and coastal resources; water supply and flood protection; agriculture; forestry; biodiversity and habitat; and transportation and energy infrastructure. The report recommends strategies and specific

responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

### **Assembly Bill 32 - Climate Change Scoping Plan**

**2008 Climate Change Scoping Plan:** On December 11, 2008 ARB adopted its *Climate Change Scoping Plan* (2008 Scoping Plan), which functions as a roadmap of ARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. The 2008 Scoping Plan contains the main strategies California has implemented to reduce CO<sub>2</sub>e emissions by 169 million metric tons (MMT), or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT of CO<sub>2</sub>e under a business-as-usual scenario. (This is a reduction of 42 MMT CO<sub>2</sub>e, or almost 10 percent, from 2002–2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.) The 2008 Scoping Plan also breaks down the amount of GHG emissions reductions ARB recommends for each emissions sector of the state's GHG inventory. The 2008 Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO<sub>2</sub>e),
- the Low-Carbon Fuel Standard (15.0 MMT CO<sub>2</sub>e),
- energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO<sub>2</sub>e), and
- a renewable portfolio standard for electricity production (21.3 MMT CO<sub>2</sub>e).

**First Update to the Climate Change Scoping Plan:** In June 2013, CARB kicked off a public process intended develop the First Update to the Climate Change Scoping Plan (2014 Scoping Plan). The public process included: regional workshops, input/advise from stakeholders, advise from the Environmental Justice Advisory Committee, public review and comment of a draft Scoping Plan, and ultimately public hearings. On May 22, 2014, the First Update to the Climate Change Scoping Plan was approved by the Board.

The 2014 Scoping Plan indicates that California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32. The set of actions the State is taking is driving down greenhouse emissions and moving the State steadily in the direction of a cleaner energy economy. For instance, the 2014 Scoping Plan indicates that currently, about 23 percent of the State's electricity comes from renewable power and that this will increase to at least 33 percent by 2020 under new requirements set in place in 2011. The 2014 Scoping Plan indicates that collectively, the State's set of vehicle, fuels, and land use policies will cut in half emissions from passenger transportation and drivers' fuel costs over the next 20 years. The 2014 Scoping Plan cites California's Low Carbon Fuel Standard (LCFS) and California's vehicle GHG standards (Pavley) as two standards that have, and will continue to, dramatically scale up emission reductions in the future. The 2014 Scoping Plan cites work by regulators on developing a national GHG standard and corresponding fuel efficiency standard for medium- and heavy-duty trucks as well as California's pioneering zero emission vehicles (ZEV) regulation as areas where California is making major strides toward reducing the future GHG emission. The 2014 Scoping Plan indicates that seven Metropolitan Planning Organizations have adopted Sustainable Community Strategies that are intended to help drive GHG emission

reductions, by creating more livable communities that offer greater housing and transportation options; improved access to resources and services; safer, more vibrant neighborhoods; and healthier lifestyles where people can live, work, and play without having to travel long distances or sit through congestion. Lastly, the 2014 Scoping Plan cites the Cap-and-Trade Program launched by California, as a program that will ensure that California remains on track to continually reduce emissions and meet the 2020 limit and play a critical role in keeping California on the right emissions reduction trajectory to meet ongoing reduction targets at the lowest possible cost.

### **California Strategy to Reduce Petroleum Dependence (AB 2076)**

In response to the requirements of AB 2076 (Chapter 936, Statutes of 2000), the CEC and the CARB developed a strategy to reduce petroleum dependence in California. The strategy, *Reducing California's Petroleum Dependence*, was adopted by the CEC and CARB in 2003. The strategy recommends that California reduce on-road gasoline and diesel fuel demand to 15 percent below 2003 demand levels by 2020 and maintain that level for the foreseeable future; the Governor and Legislature work to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles (SUVs); and increase the use of non-petroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.

### **Climate Action Program at Caltrans**

The California Department of Transportation, Business, Transportation, and Housing Agency, prepared a Climate Action Program in response to new regulatory directives. The goal of the Climate Action Program is to promote clean and energy efficient transportation, and provide guidance for mainstreaming energy and climate change issues into business operations. The overall approach to lower fuel consumption and CO<sub>2</sub> from transportation is twofold: (1) reduce congestion and improve efficiency of transportation systems through smart land use, operational improvements, and Intelligent Transportation Systems; and (2) institutionalize energy efficiency and GHG emission reduction measures and technology into planning, project development, operations, and maintenance of transportation facilities, fleets, buildings, and equipment.

The reasoning underlying the Climate Action Program is the conclusion that “the most effective approach to addressing GHG reduction, in the short-to-medium term, is strong technology policy and market mechanisms to encourage innovations. Rapid development and availability of alternative fuels and vehicles, increased efficiency in new cars and trucks (light and heavy duty), and super clean fuels are the most direct approach to reducing GHG emissions from motor vehicles (emission performance standards and fuel or carbon performance standards).”

### **Governor's Low Carbon Fuel Standard (Executive Order #S-01-07)**

Executive Order #S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through establishment of a Low Carbon Fuel Standard. The Low Carbon Fuel Standard is incorporated into the State Alternative Fuels Plan and is one of the proposed discrete early action GHG reduction measures identified by CARB pursuant to AB 32.

### **Senate Bill 97 (SB 97)**

SB 97 (Chapter 185, 2007) required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State California Environmental Quality Act (CEQA) Guidelines for addressing greenhouse gas emissions. OPR prepared its recommended amendments to the State CEQA Guidelines to provide guidance to public agencies regarding the analysis and mitigation of greenhouse gas emissions and the effects of greenhouse gas emissions in draft CEQA documents. The Amendments became effective on March 18, 2010.

### **Senate Bill 375 (SB 375)**

SB 375 (Chapter 728, 2008) (SB 375) was built on AB 32 (California's 2006 climate change law). SB 375's core provision is a requirement for regional transportation agencies to develop a Sustainable Communities Strategy (SCS) in order to reduce GHG emissions from passenger vehicles. The SCS is one component of the Regional Transportation Plan (RTP).

The SCS outlines the region's plan for combining transportation resources, such as roads and mass transit, with a realistic land use pattern, in order to meet a state target for reducing GHG emissions. The strategy must take into account the region's housing needs, transportation demands, and protection of resource and farmlands.

Additionally, SB 375 modified the state's Housing Element Law to achieve consistency between the land use pattern outlined in the SCS and the Regional Housing Needs Assessment allocation. The legislation also substantially improved cities' and counties' accountability for carrying out their housing element plans.

Finally, SB 375 amended CEQA (Pub. Resources Code, § 21000 et seq.) to ease the environmental review of developments that help reduce the growth of GHG emissions.

### **California Building Energy Efficiency Standards**

Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards, was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. On January 1, 2010, the California Building Standards Commission adopted CALGreen and became the first state in the United States to adopt a statewide green building standards code. CALGreen requires new buildings to reduce water consumption by 20 percent, divert 50 percent of construction waste from landfills, and install low pollutant-emitting materials.

#### *LOCAL*

### **San Joaquin Valley Air Pollution Control District Climate Change Action Plan**

In August 2008, the SJVAPCD adopted its Climate Change Action Plan. The Climate Change Action Plan directed the SJVAPCD's Air Pollution Control Officer to develop guidance to assist APCD staff, Valley businesses, land use agencies and other permitting agencies in addressing GHG emissions as part of the CEQA process. Regarding CEQA guidance, some of the goals of the Climate Change Action Plan are to assist local land use agencies, developers and the public by identifying and quantifying GHG emission

reduction measures for development projects and by providing tools to streamline evaluation of project-specific GHG effects, and to assist Valley businesses in complying with State law related to GHG emissions.

A product of this direction to provide CEQA guidance is the Final Staff Report – Climate Change Action Plan: Addressing GHG Emissions Impacts, presented to the APCD Board in December 2009. A central component of the Final Staff Report is the establishment of Best Performance Standards, which are specifications or project design elements that identify effective, feasible GHG emission reduction measures. Emission reductions achieved through Best Performance Standards implementation would be pre-quantified, thus negating the need for project-specific quantification of GHG emissions.

For projects not implementing Best Performance Standards, demonstration of a 29% reduction in GHG emissions from business-as-usual conditions is required to determine that a project would have a less than cumulatively significant impact. Appendix J of the Final Staff Report provides a table of GHG emission reduction measures for development projects, along with a point value that corresponds to a percentage decrease in GHG emissions when available.

### **2014 Regional Transportation Plan/Sustainable Communities Strategy**

The 2014 San Joaquin County Regional Transportation Plan, which has been named “Valley Visions San Joaquin,” is the first RTP in San Joaquin County to contain a SCS, the result of the Sustainable Communities and Climate Protection Act of 2008 (i.e., SB 375). The SCS coordinates future transportation investments and land use strategies to prioritize a multi-modal investment plan covering a 27-year period extending out to 2040.

The RTP is a long-range transportation plan that guides the region’s transportation improvements over a minimum of 20-years and is updated every four. Using growth forecasts and economic trends projected out over study timeframe, the RTP considers the role of transportation in the broader context of economic, environmental, and quality-of-life goals for the future, identifying regional transportation strategies to address our mobility needs. The 2014 RTP will address all transportation modes including motor vehicles, transit (commuter and local), rail (commuter and inter-regional), goods movement (rail, truck, and water), bicycle and pedestrian facilities, aviation systems, transportation systems management (TSM) and transportation demand management (TDM) programs, and other projects considered over the planning horizon of 2040. Regional transportation improvement projects proposed to be funded, in whole or in part, in the state transportation improvement program must be included in the adopted RTP.

The eight counties of the San Joaquin Valley are coordinating on some aspects of these planning efforts to maximize resources, with each area’s Metropolitan Planning Organization (MPO) developing a separate plan. MPOs are responsible for setting transportation policy and priorities for a region and documenting how transportation funds will be spent in a Regional Transportation Plan. Specifically, the San Joaquin County SCS will:

- Identify the general location of uses, residential densities, and building intensities within the region

## 5.0 CONSERVATION AND NATURAL RESOURCES

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- Identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region
- Gather and consider the best practically available scientific information regarding resource areas and farmland in the region
- Set forth a forecasted development pattern for the region
- Identify areas within the region sufficient to house all the population of the region
- Identify a transportation network to service the transportation needs of the region
- Quantify the reduction in greenhouse gas emissions projected to be achieved by the SCS

The Greenhouse Gas Reduction Targets for the 2014 San Joaquin County RTP are as follows:

- 5% per capita reduction from 2005 levels by 2020
- 10% per capita reduction from 2005 levels by 2035

### **City of Manteca Climate Action Plan**

The City of Manteca Climate Action Plan (2013) contains an inventory of GHG emissions, reduction strategies, and a means to implement, monitor, and fund the Plan. The purpose of the Climate Action Plan is to:

- Outline a course of action for the City government and the community of Manteca to reduce per capita greenhouse gas emissions by amounts required to show consistency with AB 32 goals for the year 2020 and adapt to effects of climate change, and
- Provide clear guidance to City staff regarding when and how to implement key provisions of the Climate Action Plan.
- Provide a streamlined mechanism for projects that are consistent with the CAP to demonstrate that they would not contribute significant greenhouse gas impacts.

## EXISTING GREENHOUSE GAS EMISSIONS IN MANTECA

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### **Baseline GHG Emissions Inventory**

The City of Manteca adopted a stand-alone Climate Action Plan October 15, 2013. The first step in developing the CAP was to identify the greenhouse gas emission sources that are within the control or influence of the City of Manteca in emission inventories. Emission inventories are accounting systems used to compile information on the types and quantities of emissions generated in a geographic area at a specified time. Emission inventories allow sources to be ranked by importance and tracked over time. This is critical for developing a control strategy and for measuring progress toward achieving targets. The CAP includes a Government Operations Inventory that includes emission sources directly owned and operated by the City and a Community Inventory that includes all emission sources within the City of Manteca.

### **Government Operations Inventory**

Local government operations emissions are presented in Table 5.4-1. The results indicate that the largest source of emissions is from the City's vehicle fleet used to provide public services to the residents of Manteca. The next two largest sources are wastewater facilities and water delivery, which

generate emissions primarily related to electricity consumption from pumping water. Building and facilities emissions are related to electricity and natural gas consumption for cooling, lighting, and heating.

**TABLE 5.4-1: CITY OF MANTECA GOVERNMENT OPERATIONS GREENHOUSE GAS EMISSIONS INVENTORY**

<i>SECTOR</i>	<i>METRIC TONS (CO<sub>2</sub>E)</i>	<i>PERCENT OF SECTOR EMISSIONS</i>
Vehicle Fleet	2,358	32.2
Wastewater Facilities	1,738	23.7
Water Delivery Facilities	1,017	13.9
Employee Commute	983	13.4
Buildings and Facilities	613	8.4
Public Lighting	564	7.7
Government Generated Waste	49	0.7
<b>Totals</b>	<b>7,321</b>	<b>100.0</b>

*NOTE: CO<sub>2</sub>E = CARBON DIOXIDE EQUIVALENTS SOURCE: CITY OF MANTECA GOVERNMENT OPERATIONS GREENHOUSE GAS INVENTORY; MANTECA CLIMATE ACTION PLAN 2013.*

**Community Inventory**

The Community Inventory accounts for the emissions from all sources within the control or influence of the City of Manteca. Emissions from motor vehicles occur within the City of Manteca geographic area; however, a portion of these emissions is not within the control or influence of the City. Some trips pass through the City on freeways crossing the community. Emissions from those trips are not included in the inventory. For trips that begin in the City but end in a different jurisdiction, half the emissions are included in the inventory. Conversely, for trips that begin outside the City but end within the City, half the emissions are included in the inventory.

The inventories include estimates for two baseline years and two future years. The year 2005 is provided to account for the change in emissions from statewide greenhouse gas regulations adopted since that time. The year 2010 represents the most recent year with complete activity data. The year 2020 is required to demonstrate consistency with state targets adopted for AB 32. The year 2035 is provided to show emissions in the Senate Bill (SB) 375 regional target year. The year 1990 was not chosen as an inventory year because the form of the targets (reductions from 2020) does not require a 1990 inventory, and because the data needed to generate a 1990 inventory is incomplete and in a form different from more recent inventories, thereby making comparison inappropriate.

Table 5.4-2 displays the emissions by sector for 2005, 2010, 2020, and 2035 and the totals for each year. The future year inventories for 2020 and 2035 are referred to as “business as usual” inventories. The business as usual inventories reflect the effects of growth projected by the growth rates in the 2023 General Plan without the application of controls<sup>1</sup> that would reduce emissions in the future. The results of the inventories show that substantial growth in emissions would occur in the City without the application of controls.<sup>2</sup> The emissions would increase from 400,346 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>e) in 2005 to 742,186 MTCO<sub>2</sub>e in 2035 for an increase of 85 percent in 30 years. In terms of emissions per person or “per capita emissions,” the inventory shows emissions of 6.9 MTCO<sub>2</sub>e per person in 2005 and a decrease to 6.3 MTCO<sub>2</sub>e per person by 2035.

<sup>2</sup> Controls are regulations enacted to implement AB 32, General Plan policies, and CAP reduction measures.



## 5.0 CONSERVATION AND NATURAL RESOURCES

**TABLE 5.4-2: CITY OF MANTECA COMMUNITY BASELINE AND FUTURE YEAR INVENTORIES**

SECTOR	EMISSIONS (MTCO <sub>2</sub> E/YEAR)			
	2005	2010	2020	2035
Motor vehicles	214,075	210,901	275,507	368,297
Electricity - residential	44,108	47,343	61,212	83,668
Electricity - commercial	25,014	31,146	35,646	49,327
Natural gas - residential	45,527	50,466	65,249	89,186
Natural gas - commercial	9,856	11,818	13,526	18,717
Waste	42,305	30,454	21,586	29,505
Ozone depleting substance (ODS) substitutes*	19,461	26,741	75,711	103,486
Total	400,346	408,869	548,437	742,186
Per capita emissions	6.9	6.1	6.3	6.3

NOTES: MTCO<sub>2</sub>E = METRIC TONS OF CARBON DIOXIDE EQUIVALENTS

PER CAPITA EMISSIONS ARE ESTIMATED BY DIVIDING THE TOTAL EMISSIONS BY THE POPULATION ESTIMATES FROM TABLE 5.

\* OZONE DEPLETING SUBSTANCES (ODS) ARE GASES THAT CAUSE CHEMICAL DESTRUCTION OF THE OZONE IN THE STRATOSPHERE (A LAYER OF AIR IN THE UPPER ATMOSPHERE). HIGH GLOBAL WARMING POTENTIAL GASES ARE BEING INTRODUCED AS SUBSTITUTES TO COMPLY INTERNATIONAL TREATIES PROTECTING THE OZONE LAYER.

SOURCE: MICHAEL BRANDMAN ASSOCIATES 2013.

### Emission Reduction Target Inventory

The next step in the CAP process is to identify the amount of reductions required to demonstrate consistency with the goals of AB 32 and the target set by the state for the year 2020. Achieving the state target of reducing emissions to 1990 levels by 2020 will require a reduction in per capita emissions of 21.7 percent. Applying that percentage reduction to the City's 2020 business as usual emission inventory results in a target of 429,693 MTCO<sub>2</sub>e per year or a per capita emission rate of 4.91 MTCO<sub>2</sub>e per person per year. The City will achieve the target through a combination of compliance with state greenhouse gas regulations and with local reductions described in the CAP. Table 5.4-3 shows that substantial reductions will be achieved by the state regulations already adopted for this purpose. State regulations will reduce emissions by 19.5 percent. The City will require an additional 2.2 percent reduction from local measures to achieve the target.

**TABLE 5.4-3: CITY OF MANTECA 2020 TARGET EMISSIONS INVENTORY**

INVENTORY	COMMUNITY (MTCO <sub>2</sub> E/YR)	PER CAPITA (MTCO <sub>2</sub> E/PERSON/YR)
2020 Business as Usual	548,437	6.27
2020 Adjusted for State Regulations	441,668	5.05
2020 Community Target	429,693	4.91
2020 Local Reductions Required	12,014	0.14
Local Reductions Proposed	12,289	0.14
2020 Target Achieved	Yes	Yes

NOTE: MTCO<sub>2</sub>E/YR = METRIC TONS OF CARBON DIOXIDE EQUIVALENTS PER YEAR

SOURCE: MICHAEL BRANDMAN ASSOCIATES 2013 (SEE APPENDIX B FOR CALCULATIONS).

In 2010, ARB established these targets for 2020 and 2035 for each region covered by one of the State's metropolitan planning organizations (MPO). ARB will periodically review and update the targets, as needed. Each of California's MPOs must prepare a "sustainable communities strategy" (SCS) as an integral part of its regional transportation plan (RTP). The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. The current CAP targets set the City on a trajectory to achieve reductions through

2020 and beyond. Future updates to the CAP can add later target years and additional strategies needed to achieve those targets.

### CLIMATE ACTION PLAN STRATEGY

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The City of Manteca has identified strategies and actions needed to achieve reductions consistent with State of California targets for greenhouse gas emissions. The strategies are divided into two major categories: General Plan Implementation and Energy Efficiency and Conservation.

**General Plan Implementation.** The first category relates to land use and transportation strategies implemented through the General Plan. These are long-term strategies for developing the City in a way that minimizes motor vehicle use and encourages walking, bicycling, and transit use. All projects are required to demonstrate consistency with the General Plan; therefore, as development occurs, each project must comply with policies that apply to its circumstances. The City's General Plan 2023 contains numerous goals, policies, and implementation measures that promote sustainable development practices that will result in reduced greenhouse gas emissions in new growth and redevelopment areas. The CAP identifies specific actions that the City will take through the project approval process to incorporate the General Plan's policies into projects.

**Energy Efficiency and Conservation.** The second category is energy efficiency and conservation. These include strategies to improve the energy efficiency in new and existing buildings and structures and strategies to reduce energy use by conserving water, and reducing waste. Another energy strategy involves encouraging the use of low carbon fuels, renewable fuels, and self-generation with zero emission technologies like photovoltaic (PV) solar power systems.

All of the reduction strategies contained in the CAP are supported through education and outreach programs to increase public awareness of the benefits and opportunities provided. In addition, land use strategies that apply to new development can provide destinations and infrastructure that benefit the entire community by improving connections to the existing community and by providing destinations that encourage walking, bicycling, and transit use. Energy efficiency strategies provide savings in terms of fuel consumption that help pay the cost of improvements. Outreach and education on the savings can help spur voluntary actions.

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## 5.0 CONSERVATION AND NATURAL RESOURCES

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## 5.5 GEOLOGY, SOILS, AND SEISMICITY

This section addresses seismic and geologic hazards in the City of Manteca. For hazards relating to flooding, wildfire, and hazardous materials see Section 4.0 (Hazards, Safety, and Noise)

### REGULATORY FRAMEWORK

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#### *STATE*

The State of California has established a variety of regulations and requirements related to seismic safety and structural integrity, including the California Building Standards Code, the Alquist-Priolo Earthquake Fault Zoning Act, and the Seismic Hazards Mapping Act.

#### **California Building Standards Code**

Title 24 of the California Code of Regulations, known as the California Building Standards Code (CBSC) or simply "Title 24," contains the regulations that govern the construction of buildings in California. The CBSC includes 12 parts: California Building Standards Administrative Code, California Building Code, California Residential Building Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Historical Building Code, California Fire Code, California Existing Building Code, California Green Building Standards Code (CALGreen Code), and the California Reference Standards Code. Through the CBSC, the State provides a minimum standard for building design and construction. The CBSC contains specific requirements for seismic safety, excavation, foundations, retaining walls, and site demolition. It also regulates grading activities, including drainage and erosion control.

The California Building Code, Title 24, Part 2, Chapter 16 addresses structural design, Chapter 17 addresses structural tests and special inspections, and Chapter 18 addresses soils and foundations. Section 1610 provides structural design standards for foundation walls and retaining walls to ensure resistance to lateral soil loads. Section 1613 provides structural design standards for earthquake loads. Section 1704.7 requires special inspections for existing site soil conditions, fill placement and load-bearing requirements during the construction as specified in Table 1704.7 of this section. Sections 1704.8 through 1704.16 provide inspection and testing requirements for various foundation types, and construction material types. Section 1803.1.1.1 requires each city and county enact an ordinance which requires a preliminary soil report and that the report be based upon adequate test borings or excavations, of every subdivision, where a tentative and final map is required pursuant to Section 66426 of the Government Code. Section 1803.5.3 defines expansive soils and specifies that in areas likely to have expansive soil, the building official shall require soil tests to determine where such soils do exist. Section 1803.5.4 specifies that a subsurface soil investigation must be performed to determine whether the existing ground-water table is above or within 5 feet (1524 mm) below the elevation of the lowest floor level where such floor is located below the finished ground level adjacent to the foundation. Section 1803.5.8 provides specific standards where shallow foundations will bear on compacted fill material more than 12 inches (305 mm) in depth. Sections 1803.5.11 and 1803.5.12 provide requirements for geotechnical investigations for structures assigned varying Seismic Design Categories in accordance with Section 1613. Section 1804 provides standards and requirements for excavation, grading, and fill. Sections 1808, 1809, and 1810 provide standards and requirements for the construction of varying foundations.

### **Alquist-Priolo Earthquake Fault Zoning Act**

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 sets forth the policies and Criteria of the State Mining and Geology Board, which governs the exercise of governments' responsibilities to prohibit the location of developments and structures for human occupancy across the trace of active faults. The policies and criteria are limited to potential hazards resulting from surface faulting or fault creep within Earthquake Fault Zones, as delineated on maps officially issued by the State Geologist. Working definitions include:

- Fault – a fracture or zone of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side;
- Fault Zone – a zone of related faults, which commonly are braided and sub parallel, but may be branching and divergent. A fault zone has a significant width (with respect to the scale at which the fault is being considered, portrayed, or investigated), ranging from a few feet to several miles;
- Sufficiently Active Fault – a fault that has evidence of Holocene surface displacement along one or more of its segments or branches (last 11,000 years); and
- Well-Defined Fault – a fault whose trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The geologist should be able to locate the fault in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

“Sufficiently Active” and “Well Defined” are the two criteria used by the State to determine if a fault should be zoned under the Alquist-Priolo Act.

### **Seismic Hazards Mapping Act**

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically-induced landslides. Under the Act, seismic hazard zones are to be mapped by the State Geologist to assist local governments in land use planning. The program and actions mandated by the Seismic Hazards Mapping Act closely resemble those of the Alquist-Priolo Earthquake Fault Zoning Act (which addresses only surface fault-rupture hazards) and are outlined below:

The State Geologist is required to delineate the various “seismic hazard zones.”

- Cities and Counties, or other local permitting authority, must regulate certain development “projects” within the zones. They must withhold the development permits for a site within a zone until the geologic and soil conditions of the site are investigated and appropriate mitigation measures, if any, are incorporated into development plans.
- The State Mining and Geology Board provides additional regulations, policies, and criteria, to guide cities and counties in their implementation of the law. The Board also provides guidelines for preparation of the Seismic Hazard Zone Maps and for evaluating and mitigating seismic hazards.

- Sellers (and their agents) of real property within a mapped hazard zone must disclose that the property lies within such a zone at the time of sale.

### Caltrans Seismic Design Criteria

The California Department of Transportation (Caltrans) has Seismic Design Criteria (SDC), which is an encyclopedia of new and currently practiced seismic design and analysis methodologies for the design of new bridges in California. The SDC adopts a performance-based approach specifying minimum levels of structural system performance, component performance, analysis, and design practices for ordinary standard bridges. The SDC has been developed with input from the Caltrans Offices of Structure Design, Earthquake Engineering and Design Support, and Materials and Foundations. Memo 20-1 outlines the bridge category and classification, seismic performance criteria, seismic design philosophy and approach, seismic demands and capacities on structural components and seismic design practices that collectively make up Caltrans’ seismic design methodology.

#### LOCAL

### City of Manteca General Plan

The existing Manteca General Plan includes the following policies and implementation measures related to geology and soils:

#### Safety Element

**POLICY S-P-1.** The City shall require preparation of geological reports and/or geological engineering reports for proposed new development located in areas of potentially significant geological hazards, including potential subsidence (collapsible surface soils) due to groundwater extraction.

**POLICY S-P-2.** The City shall require new development to mitigate the potential impacts of geologic hazards through Building Plan review.

**POLICY S-P-3.** The City shall require new development to mitigate the potential impacts of seismic induced settlement of uncompacted fill and liquefaction (water-saturated soil) due to the presence of a high water table.

**POLICY S-P-4.** The City shall maintain an inventory of pre-1940 unreinforced masonry buildings within the city. No change in use to a higher occupancy or more intensive use shall be approved in such structures until an engineering evaluation of the structure has been conducted and any structural deficiencies corrected. The Redevelopment Agency shall be encouraged to assist property owners in reinforcing buildings.

**POLICY S-P-5.** The City shall ensure that all public facilities, such as buildings, water tanks, and reservoirs, are structurally sound and able to withstand seismic shaking and the effects of seismically induced ground failure.

**POLICY S-P-6.** The City shall comply with the California State seismic and building standards in the design and siting of critical facilities, including police and fire stations, school facilities, hospitals, hazardous materials manufacturing and storage facilities, and large public assembly halls.

**IMPLEMENTATION S-I-1.** All new development shall comply with the current Uniform Building Code (UBC) requirements that stipulate building structural material and reinforcement.

## 5.0 CONSERVATION AND NATURAL RESOURCES

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IMPLEMENTATION S-I-2. All new development shall comply with California Health and Safety Code Section 19100 et seq. (Earthquake Protection Law), which requires that buildings be designed to resist stresses produced by natural forces such as earthquakes and wind.

IMPLEMENTATION S-I-3. The City shall inventory potentially hazardous buildings within the city and adopt a mitigation program, including requirements for strengthening buildings, changing the use of the buildings to an acceptable occupancy level, or demolishing the buildings.

### GEOLOGIC SETTING

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#### **Regional Geology**

The Planning Area lies in the San Joaquin Valley in central California. The San Joaquin Valley is located in the southern portion of the Great Valley Geomorphic Province. The Great Valley, also known as the Central Valley, is a topographically flat, northwest-trending, structural trough (or basin) about 50 miles wide and 450 miles long. It is bordered by the Tehachapi Mountains on the south, the Klamath Mountains on the north, the Sierra Nevada on the east, and the Coast Ranges on the west.

The San Joaquin Valley is filled with thick sedimentary rock sequences that were deposited as much as 130 million years ago. Large alluvial fans have developed on each side of the Valley. The larger and more gently sloping fans are on the east side of the San Joaquin Valley, and overlie metamorphic and igneous basement rocks. These basement rocks are exposed in the Sierra Nevada foothills and consist of meta-sedimentary, volcanic, and granitic rocks.

#### **Local Setting**

##### *TOPOGRAPHY*

The Planning Area is relatively flat with natural gentle slope from east to west. The city's topography ranges in elevation from approximately 50 to 20 feet above sea level. Figure 5.5-1 shows the USGS Lathrop and Manteca Quadrangle Topographic view.

##### *SOILS*

A Custom Soil Survey was completed for the Planning Area using the NRCS Web Soil Survey program. The NRCS Soils Map is provided in Figure 5.5-2. Table 5.5-1 below identifies the type and range of soils found in the Planning Area.

As shown in Table 5.5-1, the majority of soils within the Planning Area consist of course and fine sands and sandy loams. Below is a brief description of prominent soils within the Planning Area.

**TABLE 5.5-1: PLANNING AREA SOILS**

UNIT SYMBOL	NAME	ACRES	PERCENT OF AOI
108	Arents, saline-sodic, 0 to 2 percent slopes	395.45	1.47%
109	Bisgani loamy coarse sand, partially drained, 0 to 2 percent slopes	515.08	1.91%
130	Columbia fine sandy loam, drained, 0 to 2 percent slopes	390.26	1.45%
131	Columbia fine sandy loam, partially drained, 0 to 2 percent slopes, occasionally flooded	14.70	0.05%
141	Delhi fine sand, 0 to 5 percent slopes	1,126.56	4.18%
142	Delhi loamy sand, 0 to 2 percent slopes, MLRA 17	3,857.41	14.31%
143	Delhi-Urban land complex, 0 to 2 percent slopes	3,626.69	13.46%
144	Dello sand, partially drained, 0 to 2 percent slopes, occasionally flooded	59.89	0.22%
145	Dello loamy sand, drained, 0 to 2 percent slopes	279.24	1.04%
150	Dumps	35.86	0.13%
152	Egbert mucky clay loam, partially drained, 0 to 2 percent slopes	23.78	0.09%
153	Egbert silty clay loam, partially drained, 0 to 2 percent slopes	84.96	0.32%
160	Galt clay, 0 to 1 percent slopes, MLRA 17	87.86	0.33%
166	Grangeville fine sandy loam, partially drained, 0 to 2 percent slopes	85.32	0.32%
169	Guard clay loam, drained, 0 to 2 percent slopes	100.71	0.37%
175	Honcut sandy loam, 0 to 2 percent slopes	416.88	1.55%
196	Manteca fine sandy loam, 0 to 2 percent slopes	113.20	0.42%
197	Merritt silty clay loam, partially drained, 0 to 2 percent slopes	364.64	1.35%
254	Timor loamy sand, 0 to 2 percent slopes	2,020.36	7.50%
255	Tinnin loamy coarse sand, 0 to 2 percent slopes	7,724.89	28.66%
260	Urban land	125.55	0.47%
265	Veritas sandy loam, partially drained, 0 to 2 percent slopes	32.31	0.12%
266	Veritas fine sandy loam, 0 to 2 percent slopes	5,377.84	19.95%
284	Water	93.31	0.35%
--	<b>Totals</b>	<b>26,952.75</b>	<b>100.00%</b>

SOURCE: NRCS CUSTOM SOIL SURVEY 2016.

**Delhi fine sands.** This series consists of very deep, somewhat excessively drained soils. They formed in wind modified material weathered from granitic rock sources. Delhi soils are on floodplains, alluvial fans and terraces. Slopes are 0 to 15 percent. They have negligible to slow runoff and rapid permeability. Common uses for this series include: growing grapes, peaches, truck crops, alfalfa and for home sites. Principal native plants are buckwheat and a few shrubs and trees. Typical vegetation is annual grasses and forbs.

**Delhi loamy sand.** This series consists of very deep, somewhat excessively drained soils. They formed in wind modified material weathered from granitic rock sources. Delhi soils are on floodplains, alluvial fans and terraces. Slopes are 0 to 15 percent. They have negligible to slow runoff and rapid permeability. Common uses for this series include: growing grapes, peaches, truck crops, alfalfa and for home sites.



## 5.0 CONSERVATION AND NATURAL RESOURCES

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Principal native plants are buckwheat and a few shrubs and trees. Typical vegetation is annual grasses and forbs.

**Timor loamy sand.** This series consists of deep, moderately well drained soils. They formed in granitic alluvium. Timor soils are on low fan terraces or alluvial fans. Slopes is 0 to 2 percent. They have slow runoff and rapid permeability. Common uses for this series include: irrigated cropland growing primarily almonds, alfalfa, onions, tomatoes, small grains, grapes and pasture. Vegetation consists of red brome, filaree, soft chess, wildoats, ripgut brome and scattered California White Oaks.

**Tinnin loamy coarse sand.** This series consists of well drained soils on low fan terraces and alluvial fans. These soils are very deep, and form in alluvium derived from granitic rock sources. Slopes range from 0 to 2 percent. This series is characterized as well draining, slow runoff, and rapid permeability. Common uses for this series are irrigated cropland growing primarily almonds, alfalfa, onions, tomatoes, small grains, grapes and pasture. Vegetation consists of red brome, filaree, soft chess, wildoats, ripgut brome and scattered valley oaks.

**Veritas fine sandy loam.** This series consists of deep to duripan, moderately well drained soils. They formed in alluvium derived from mixed rock sources. Veritas soils are on low fan terraces. They have slow runoff and moderately rapid permeability. Common uses for this series include irrigated cropland. Alfalfa, barley and corn are the principal crops. Vegetation is annual grasses, forbs and scattered valley oaks.

## FAULTS AND SEISMICITY

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### Faults

A fault is a fracture in the crust of the earth along which rocks on one side have moved relative to those on the other side. A fault trace is the line on the earth's surface defining the fault. Displacement of the earth's crust along faults releases energy in the form of earthquakes and in some cases in fault creep. Most faults are the result of repeated displacements over a long period of time.

Surface rupture occurs when movement on a fault deep within the earth breaks through to the surface. Surface ruptures have been known to extend up to 50 miles with displacements of an inch to 20 feet. Fault rupture almost always follows preexisting faults, which are zones of weakness. Rupture may occur suddenly during an earthquake or slowly in the form of fault creep. Sudden displacements are more damaging to structures because they are accompanied by shaking.

The State of California designates faults as active, potentially active, and inactive depending on how recent the movement that can be substantiated for a fault. Table 5.5-2 presents the California fault activity rating system.

**TABLE 5.5-2: FAULT ACTIVITY RATING**

<i>FAULT ACTIVITY RATING</i>	<i>GEOLOGIC PERIOD OF LAST RUPTURE</i>	<i>TIME INTERVAL (YEARS)</i>
Active (A)	Holocene	Within last 11,000 years
Potentially Active (PA)	Quaternary	11,000-1.6 Million Years
Inactive (I)	Pre-Quaternary	Greater than 1.6 Million

*SOURCE: CALIFORNIA GEOLOGICAL SURVEY*

The U.S. Geological Survey identifies potential seismic sources within 5 miles of the Planning Area. The closest known faults classified as active by the U.S. Geological Survey include an unnamed fault east of the City of Tracy, located approximately 5 miles to the west of Manteca, and the San Joaquin fault, located approximately 15 miles to the southwest of the city. The Midway fault is located approximately 20 miles to the west. Other faults that could potentially affect the Manteca include the Corral Hollow-Carnegie fault, the Greenville fault, the Antioch fault, and the Los Positas fault. Figure 5.5-3 provides a map of known area faults.

**Seismicity**

The amount of energy available to a fault is determined by considering the slip-rate of the fault, its area (fault length multiplied by down-dip width), maximum magnitude, and the rigidity of the displaced rocks. These factors are combined to calculate the moment (energy) release on a fault. The total seismic energy release for a fault source is sometimes partitioned between two different recurrence models, the characteristic and truncated Gutenberg-Richter (G-R) magnitude-frequency distributions. These models incorporate our knowledge of the range of magnitudes and relative frequency of different magnitudes for a particular fault. The partition of moment and the weights for multiple models are given in the following summary.

Earthquakes are generally expressed in terms of intensity and magnitude. Intensity is based on the observed effects of ground shaking on people, buildings, and natural features. By comparison, magnitude is based on the amplitude of the earthquake waves recorded on instruments, which have a common calibration. The Richter scale, a logarithmic scale ranging from 0.1 to 9.0, with 9.0 being the strongest, measures the magnitude of an earthquake relative to ground shaking. Table 5.5-3 provides a description and a comparison of intensity and magnitude.

**TABLE 5.5-3: RICHTER MAGNITUDES AND EFFECTS**

<i>MAGNITUDE</i>	<i>EFFECTS</i>
< 3.5	Typically not felt
3.5 – 5.4	Often felt but damage is rare
5.5 – < 6	Damage is slight for well-built buildings
6.1 – 6.9	Destructive potential over ±60 miles of occupied area
7.0 – 7.9	“Major Earthquake” with the ability to cause damage over larger areas
≥ 8	“Great Earthquake” can cause damage over several hundred miles

*SOURCE: ASSOCIATION OF BAY AREA GOVERNMENTS, 2011.*

According to the California Geological Survey’s Probabilistic Seismic Hazard Assessment Program, San Joaquin County is considered to be within an area that is predicted to have a 10 percent probability that a seismic event would produce horizontal ground shaking of 10 to 20 percent within a 50-year period.

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This level of ground shaking correlates to a Modified Mercalli intensity of V to VII, light to strong. Table 5.5-4 below presents Modified Mercalli intensity effects at each level.

**TABLE 5.5-4: MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES**

<i>RICHTER MAGNITUDE</i>	<i>MODIFIED MERCALLI</i>	<i>EFFECTS OF INTENSITY</i>
0.1 – 0.9	I	Earthquake shaking not felt
1.0 – 2.9	II	Shaking felt by those at rest.
3.0 – 3.9	III	Felt by most people indoors, some can estimate duration of shaking.
4.0 – 4.5	IV	Felt by most people indoors. Hanging objects rattle, wooden walls and frames creak.
4.6 – 4.9	V	Felt by everyone indoors, many can estimate duration of shaking. Standing autos rock. Crockery clashes, dishes rattle and glasses clink. Doors open, close and swing.
5.0 – 5.5	VI	Felt by all who estimate duration of shaking. Sleepers awaken, liquids spill, objects are displaced, and weak materials crack.
5.6 – 6.4	VII	People frightened and walls unsteady. Pictures and books thrown, dishes and glass are broken. Weak chimneys break. Plaster, loose bricks and parapets fall.
6.5 – 6.9	VIII	Difficult to stand. Waves on ponds, cohesionless soils slump. Stucco and masonry walls fall. Chimneys, stacks, towers, and elevated tanks twist and fall.
7.0 – 7.4	IX	General fright as people are thrown down, hard to drive. Trees broken, damage to foundations and frames. Reservoirs damaged, underground pipes broken.
7.5 – 7.9	X	General panic. Ground cracks, masonry and frame buildings destroyed. Bridges destroyed, railroads bent slightly. Dams, dikes and embankments damaged.
8.0 – 8.4	XI	Large landslides, water thrown, general destruction of buildings. Pipelines destroyed, railroads bent.
8.5 +	XII	Total nearby damage, rock masses displaced. Lines of sight/level distorted. Objects thrown into air.

SOURCE: UNITED STATES GEOLOGICAL SURVEY

The Significant United States Earthquake data published by the USGS in the National Atlas identifies earthquakes that caused deaths, property damage, and geologic effects or were felt by populations near the epicenter. No significant earthquakes are identified within the Planning Area; however, significant earthquakes are documented in the region. The following table presents the significant earthquakes in the region.

**TABLE 5.5-5: SIGNIFICANT EARTHQUAKES IN THE REGION**

<i>MAGNITUDE</i>	<i>INTENSITY</i>	<i>LOCATION</i>	<i>YEAR</i>
6.0	VIII	South Napa	2014
5.6	VI	San Jose	2007
5.0	VII	Napa	2000
6.9	IX	Loma Prieta (San Andreas)	1989
5.4	N/A	Santa Cruz County	1989
6.2	N/A	Morgan Hill	1984
5.8, 5.8	VII	Livermore	1980

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MAGNITUDE	INTENSITY	LOCATION	YEAR
5.7	N/A	Coyote Lake	1979
5.7, 5.6	N/A	Santa Rosa	1969
5.3, 4.2	N/A	Daly City	1957
5.4	N/A	Concord	1954
6.5	N/A	Calaveras fault	1911
7.9	IX	San Francisco	1906
6.8	N/A	Mendocino	1898
6.2	N/A	Mare Island	1898
6.3	N/A	Calaveras fault	1893
6.2	VIII	Winters	1892
6.4	N/A	Vacaville	1892
6.8	VII	Hayward	1868
6.5	VIII	Santa Cruz Mountains	1865
6.8	N/A	San Francisco Peninsula	1838

SOURCE: UNITED STATE GEOLOGICAL SURVEY, 2015.

### Alquist-Priolo Special Study Zone

The California legislature passed the Alquist-Priolo Special Studies Zone Act in 1972 to address seismic hazards associated with faults and to establish criteria for developments for areas with identified seismic hazard zones. The California Geologic Survey (CGS) evaluates faults with available geologic and seismologic data and determines if a fault should be zoned as active, potentially active, or inactive. If CGS determines a fault to be active, then it is typically incorporated into a Special Studies Zone in accordance with the Alquist-Priolo Earthquake Hazard Act. Alquist-Priolo Special Study Zones are usually one-quarter mile or less in width and require site-specific evaluation of fault location and require a structure setback if the fault is found traversing a project site. The Planning Area is not within an Alquist-Priolo Special Study Zone. The nearest Alquist-Priolo fault zone, the Greenville fault zone, is located approximately 25 miles southwest of Manteca.

## SEISMIC HAZARDS

### Seismic Ground Shaking

The potential for seismic ground shaking in California is expected. As a result of the foreseeable seismicity in California, the State requires special design considerations for all structural improvements in accordance with the seismic design provisions in the California Building Code. These seismic design provisions require enhanced structural integrity based on several risk parameters.

### Fault Rupture

A fault rupture occurs when the surface of the earth breaks as a result of an earthquake, although this does not happen with all earthquakes. These ruptures generally occur in a weak area of an existing fault. Ruptures can be sudden (i.e. earthquake) or slow (i.e. fault creep). The Alquist-Priolo Fault Zoning Act requires active earthquake fault zones to be mapped and it provides special development

considerations within these zones. Manteca does not have surface expression of active faults and fault rupture is not anticipated. Figure 5.5-3 shown regional faults in relation to Manteca.

### **Liquefaction**

Liquefaction typically requires a significant sudden decrease of shearing resistance in cohesionless soils and a sudden increase in water pressure, which is typically associated with an earthquake of high magnitude. The potential for liquefaction is highest when groundwater levels are high, and loose, fine, sandy soils occur at depths of less than 50 feet. Soil data from the NRCS Web Soil Survey (NRCS 2017) suggests that the potential for liquefaction ranges from low to high within the planning area given that many soils are high in sand and the water table is moderately high.

### **Lateral Spreading**

Lateral spreading typically results when ground shaking moves soil toward an area where the soil integrity is weak or unsupported, and it typically occurs on the surface of a slope, although it does not occur strictly on steep slopes. Oftentimes, lateral spreading is directly associated with areas of liquefaction. The potential for liquefaction is moderate to high in many areas of the city, however because the planning area is essentially flat lateral spreading of soils has not been observed within the Planning Area.

### **Landslides**

Landslides include rockfalls, deep slope failure, and shallow slope failure. Factors such as the geological conditions, drainage, slope, vegetation, and others directly affect the potential for landslides. One of the most common causes of landslides is construction activity that is associated with road building (i.e. cut and fill). The Planning Area is essentially flat; therefore, the potential for a landslides is low.

## **NON-SEISMIC HAZARDS**

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### **Expansive Soils**

Expansive soils can undergo significant volume change with changes in moisture content. They shrink and harden when dried and expand and soften when wet. If structures are underlain by expansive soils, it is important that foundation systems be capable of tolerating or resisting any potentially damaging soil movements. In addition, it is important to limit moisture changes in the surficial soils by using positive drainage away from buildings as well as limiting landscaping watering.

According to the NRCS Web Soil Survey, the soils in the Planning Area soils vary from a low shrink-swell potential to a high shrink-swell potential. The majority of the Planning Area soils have a low potential, and small portions of the western Planning Area have a moderate to high potential. Figure 5.5-4 provides a map of the shrink-swell potential of the soils within the Planning Area and general vicinity.

### **Erosion**

Erosion naturally occurs on the surface of the earth as surface materials (i.e. rock, soil, debris, etc.) is loosened, dissolved, or worn away, and transported from one place to another by gravity. Two common types of soil erosion include wind erosion and water erosion. The steepness of a slope is an important

factor that affects soil erosion. Erosion potential in soils is influenced primarily by loose soil texture and steep slopes. Loose soils can be eroded by water or wind forces, whereas soils with high clay content are generally susceptible only to water erosion. The potential for erosion generally increases as a result of human activity, primarily through the development of facilities and impervious surfaces and the removal of vegetative cover.

The *Custom Soils Report* identified the erosion potential for the soils in the Planning Area. This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. Soil property data for each map unit component includes the hydrologic soil group, erosion factors Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the surface horizon.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Within the Planning Area, the erosion factor Kf varies from 0.02 to 0.37, which is considered a low to moderate potential for erosion. Furthermore, given the drainage characteristics of the majority of the soils and the nearly level topography of the Planning Area, water erosion hazard is considered low. The wind erosion potential ranges from moderate-to-high during the spring, summer, and fall, however this potential for wind erosion diminish during the winter.

### **Collapsible Soils**

Collapsible soils undergo a rearrangement of their grains and a loss of cementation, resulting in substantial and rapid settlement under relatively low loads. Collapsible soils occur predominantly at the base of mountain ranges, where Holocene-age alluvial fan and wash sediments have been deposited during rapid run-off events. Soils prone to collapse are commonly associated with manmade fill, wind-laid sands and silts, and alluvial fan and mudflow sediments deposited during flash floods. During an earthquake, even slight settlement of fill materials can lead to a differentially settled structure and significant repair costs. Differential settlement of structures typically occurs when heavily irrigated landscape areas are near a building foundation. Examples of common problems associated with collapsible soils include tilting floors, cracking or separation in structures, sagging floors, and nonfunctional windows and doors. Collapsible soils have not been identified in the Planning Area as an issue. However, in areas subject to potential liquefaction, the potential for liquefaction induced settlement is present.

### **Subsidence**

Land subsidence is the gradual settling or sinking of an area with little or no horizontal motion due to changes taking place underground. It is a natural process, although it can also occur (and is greatly accelerated) as a result of human activities. Common causes of land subsidence from human activity include: pumping water, oil, and gas from underground reservoirs; dissolution of limestone aquifers (sinkholes); collapse of underground mines; drainage of organic soils; and initial wetting of dry soils. Subsidence has not been identified as an issue in the Planning Area.

### Naturally Occurring Asbestos

The term “asbestos” is used to describe a variety of fibrous minerals that, when airborne, can result in serious human health effects. Naturally occurring asbestos is commonly associated with ultramafic rocks and serpentinite. Ultramafic rocks, such as dunite, peridotite, and pyroxenite are igneous rocks comprised largely of iron-magnesium minerals. As they are intrusive in nature, these rocks often undergo metamorphosis, prior to their being exposed on the Earth’s surface. The metamorphic rock serpentinite is a common product of the alteration process. Naturally occurring asbestos is not identified within San Joaquin County, although it is all located to the east and west of the Planning Area in mountainous areas in Contra Costa and Calaveras Counties. There is no naturally occurring asbestos mapped within Manteca.

### REFERENCES

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Jennings, C.W. 1994. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions. California Division of Mines and Geology (CDMG), Geologic Data Map No. 6, Map Scale 1:750,000.

Asbestos TEM Laboratories inc. adapted 2011 U.S. Geological Survey open-file report prepared by Bradley S. Van Gosen (U.S. Geological Survey, Denver, CO) and John P. Clinkenbeard (California Geological Survey, Sacramento).

## 5.6 MINERAL AND ENERGY RESOURCES

This section describes mineral and energy resources in the Planning Area from both a qualitative and quantitative perspective. The results of this assessment may be used in planning and management decisions that may affect mineral and energy resources in the Planning Area.

### REGULATORY FRAMEWORK

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#### STATE

#### Surface Mining and Reclamation Act of 1975

The California Department of Conservation Surface Mining and Reclamation Act of 1975 (§ 2710), also known as SMARA, provides a comprehensive surface mining and reclamation policy that permits the continued mining of minerals, as well as the protection and subsequent beneficial use of the mined and reclaimed land. The purpose of SMARA is to ensure that adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition and readily adaptable for alternative land uses. The production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, wildlife, range and forage, as well as aesthetic enjoyment. Residual hazards to public health and safety are eliminated. These goals are achieved through land use planning by allowing a jurisdiction to balance the economic benefits of resource reclamation with the need to provide other land uses.

If a use is proposed that might threaten the potential recovery of minerals from an area that has been classified mineral resource zone 2 (MRZ-2), SMARA would require the jurisdiction to prepare a statement specifying its reasons for permitting the proposed use, provide public notice of these reasons, and forward a copy of the statement to the State Geologist and the State Mining and Geology Board (Cal. Pub. Res. Code Section 2762). Lands classified MRZ-2 are areas that contain identified mineral resources.

#### Division of Mines and Geology

The California Division of Mines and Geology (DMG) operates within the Department of Conservation. The DMG is responsible for assisting in the utilization of mineral deposits and the identification of geological hazards.

#### State Geological Survey

Similar to the DMG, the California Geological Survey is responsible for assisting in the identification and proper utilization of mineral deposits, as well as the identification of fault locations and other geological hazards.

#### Public Resources Code

PRC Section 2762(d) and 2763 requires a lead agency to prepare a statement specifying its reasons for permitting a use that would threaten the potential to extract mineral resources either 1) in an area that has been designated in its general plan as having important minerals to be protected, or 2) if the use is proposed in an area with significant resources pursuant to Section 2761(b)(2) and the lead agency has not yet acted on the State's designation. PRC Section 2763 requires that lead agency land use decisions involving areas designated as being of regional significance shall be in accordance with the lead agency's mineral resource management policies and shall also, in balancing mineral values against alternative



land uses, consider the importance of these minerals to their market region as a whole and not just their importance to the lead agency's area of jurisdiction.

### ENVIRONMENTAL SETTING

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#### **Statewide Resources**

In 2012, the California Geological Survey identified that approximately 4 billion tons of permitted aggregate reserves lie within the 31 aggregate study areas in California. These permitted aggregate reserves have been determined to be acceptable for commercial use, exist within properties owned or leased by aggregate producing companies, and have permits allowing mining of aggregate material. Sand, gravel, and crushed stones are construction materials that are collectively referred to as construction aggregate. These materials provide the bulk and strength to Portland cement concrete (PCC), asphaltic concrete (AC), plaster, and stucco. Other uses include road base, subbase, railroad ballast, and fill.

From 1981 to 2010, California consumed an average of about 180 million tons of construction aggregate (all grades) per year. (CGS, 2012)

#### **Regional Setting**

The primary mineral resources in San Joaquin County are sand, gravel, and natural gas, with limited mining of peat, gold, and silver. In 2012, the California Geological Survey assessed the Stockton-Lodi Production-Consumption (P-C) Region mineral resources, with a focus on aggregate resources. Mineral resources in the region are classified based on whether the aggregate meets the specifications for use in PCC. This aggregate is termed "PCC-grade aggregate." The material quality specifications for PCC-grade aggregate are more restrictive than the specifications for aggregate for other applications. As a result of the strict specifications, PCC-grade aggregate deposits are more scarce and valuable than other aggregate resources.

The California Geological Survey issued Special Report 199 designating areas within the Stockton-Lodi P-C Region based on the significance of mineral resources. The Stockton-Lodi P-C Region contains about 969 million tons PCC-grade aggregate resources and 67 million tons PCC-grade sand resources. These resources are classified into different mineral resource zone designations, as described below.

To be considered significant for the purpose of mineral land classification, a mineral deposit or group of deposits, must meet criteria adopted by the State Mining and Geology Board. These criteria include marketability and threshold values. The threshold value is approximately \$17.375 million for a construction aggregate deposit. PCC-grade aggregate sells for about \$13 per ton in the Stockton-Lodi P-C Region; therefore, \$17,375,000 equates to about 1.3 million tons of PCC-grade aggregate material.

#### **Mineral Resource Classification**

Pursuant to the Surface Mining and Reclamation Act of 1975 (SMARA), the California State Mining and Geology Board oversees the Mineral Resource Zone (MRZ) classification system. The MRZ system characterizes both the location and known/presumed economic value of underlying mineral resources. The mineral resource classification system uses four main MRZs based on the degree of available geologic information, the likelihood of significant mineral resource occurrence, and the known or inferred quantity of significant mineral resources. The four classifications are described in Table 5.6-1 below.

**TABLE 5.6-1: MINERAL RESOURCE CLASSIFICATION SYSTEM**

CLASSIFICATION	DESCRIPTIONS
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
MRZ-3	Areas containing mineral deposits, the significance of which cannot be evaluated.
MRZ-4	Areas where available information is inadequate for assignment to any other MRZ classification.

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION DIVISION OF MINES AND GEOLOGY, ACCESSED DECEMBER 2016.

**Mineral Extraction Activities**

Approximately 232 million tons of PCC-grade aggregate reserves are permitted for production in the County (CGS, 2012). There are 34 active and inactive aggregate mines within San Joaquin County (San Joaquin County, 2009). One inactive mine is located within the Planning Area:

- Mine ID# 91-39-0001 – Oakwood Lake. Mine is closed and was operated by Beck Properties. And is within the Planning Area.

**Local Resources**

Figure 5.6-1: Mineral Resource Zones shows mineral resources within and near the Planning Area. As shown on Figure 5.6-1, the western portion of the planning area near Oakwood Lake is located in Resource Sector D, which consists of a large PCC-grade sand deposit situated along the San Joaquin River west of Manteca and south of Lathrop near the middle of the valley. This sector covers approximately 878 acres. Subsector D-9 is located within the Planning Area. This subsector is designated by the State Mining and Geology Board as containing regionally significant PCC-grade aggregate resources. This sector is classified as MRZ-2 (PCC sand). The Planning Area also contains an areas that are designated as MRZ-3 “areas containing mineral deposits the significance of which cannot be evaluated from available data.”

**REFERENCES**

California Department of Conservation. 2002. California Geological Survey, Note 36.

California Natural Resources Agency (2012) updated mineral land classification map.

Department of Conservation (2012) mineral land classification map for Portland Cement concrete grade aggregate in the Stockton-Lodi area.

Department of Conservation (2012) production-consumption (p-c) region, San Joaquin and Stanislaus counties, California special report 199-plate 1.

### 5.7 HYDROLOGY AND WATER QUALITY

This section provides an overview of hydrology and water quality within the Planning Area and the vicinity. For information on flood-related issues and flood safety see Section 4.4 (Flooding).

#### REGULATORY FRAMEWORK

##### *FEDERAL AND STATE*

#### **Clean Water Act (CWA)**

The Clean Water Act (CWA), initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit.

The State Water Resources Control Board (SWRCB) is responsible for implementing the Clean Water Act and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for stormwater discharges (individual permits and general permits). The SWRCB elected to adopt a Statewide General Permit (Water Quality Order No. 2013-001-DWQ-DWQ).

#### **California Water Code**

The Clean Water Act places the primary responsibility for the control of surface water pollution and for planning the development and use of water resources with the states, although this does establish certain guidelines for the States to follow in developing their programs and allows the Environmental Protection Agency to withdraw control from states with inadequate implementation mechanisms.

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code) (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and each of the Regional Water Quality Control Boards (RWQCBs) power to protect water quality, and is the primary vehicle for implementation of California's responsibilities under the Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a water quality control plan (Basin Plan) for its region the regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

Water Code Section 13260 requires all dischargers of waste that may affect water quality in waters of the state to prepare and provide a water quality discharge report to the RWQCB. Section 13260a-c is as follows:

(a) Each of the following persons shall file with the appropriate regional board a report of the discharge, containing the information that may be required by the regional board:

(1) A person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state, other than into a community sewer system.

(2) A person who is a citizen, domiciliary, or political agency or entity of this state discharging waste, or proposing to discharge waste, outside the boundaries of the state in a manner that could affect the quality of the waters of the state within any region.

(3) A person operating, or proposing to construct, an injection well.

(b) No report of waste discharge need be filed pursuant to subdivision (a) if the requirement is waived pursuant to Section 13269.

(c) Each person subject to subdivision (a) shall file with the appropriate regional board a report of waste discharge relative to any material change or proposed change in the character, location, or volume of the discharge.

### **National Pollutant Discharge Elimination System (NPDES)**

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges of pollutants to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, the ocean, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the Federal Clean Water Act, Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.)

The RWQCB issues these permits in lieu of direct issuance by the Environmental Protection Agency, subject to review and approval by the Environmental Protection Agency Regional Administrator. The terms of these NPDES permits implement pertinent provisions of the Clean Water Act and the Act's implementing regulations, including pre-treatment, sludge management, effluent limitations for specific industries, and anti-degradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the Clean Water Act's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the Clean Water Act.

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less, and are therefore to be updated regularly. The rapid and dramatic population and urban growth in the Central Valley Region has caused a significant increase in NPDES permit applications for new waste discharges. To expedite the permit issuance process, the SWRCB has adopted several general NPDES permits, each of which regulates numerous discharges of similar types of wastes. The SWRCB has issued general permits for stormwater runoff from industrial and construction sites statewide. Stormwater discharges from industrial and construction activities in the Central Valley Region can be covered under these general permits, which are administered jointly by the SWRCB and RWQCB.

### **Water Quality Control Plan for the Central Valley Region**

The Water Quality Control Plan for the Central Valley Region (Basin Plan) includes a summary of beneficial water uses, water quality objectives needed to protect the identified beneficial uses, and implementation measures. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The term “water quality standards,” as used in the Federal Clean Water Act, includes both the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The Basin Plan includes an implementation plan describing the actions by the RWQCB and others that are necessary to achieve and maintain the water quality standards.

The RWQCB regulates waste discharges to minimize and control their effects on the quality of the region’s ground and surface water. Permits are issued under a number of programs and authorities. The terms and conditions of these discharge permits are enforced through a variety of technical, administrative, and legal means. Water quality problems in the region are listed in the Basin Plan, along with the causes, where they are known. For water bodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. The Basin Plan reflects, incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code and the Clean Water Act.

### **LOCAL**

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#### **City of Manteca General Plan**

The existing Manteca General Plan Public Facilities Element and Resource Conservation element includes policies that address water quality, supply, and conservation.

##### **Public Facilities and Services Element**

**POLICY PF-P-4.** Secure sufficient sources of water to meet the needs of the existing community and planned residential and commercial growth.

**POLICY PF-P-5.** City will continue to rely principally on groundwater resources for its municipal water in the near term, will participate in the regional improvements to deliver surface water to augment the City's groundwater supply.

**POLICY PF-P-6.** The City shall develop new water sources as necessary to serve new development.

**POLICY PF-P-7.** The City shall develop new water storage facilities and major distribution lines as necessary to serve new development.

**POLICY PF-P-8.** The City will provide water for future development to maintain a balance of jobs and housing.

**POLICY PF-P-9.** City water services shall not be extended to unincorporated areas except in extraordinary circumstances. Existing commitments for City water service outside the City limits shall continue to be honored.

**POLICY PF-P-10.** Development of private water wells within the City limits shall be allowed only where the City makes a finding that it cannot feasibly provide water service. Such systems shall only be allowed to be used until such time as City water service becomes available.

**POLICY PF-P-11.** The City will develop and implement water conservation measures as necessary elements of the water system.

**POLICY PF-P-12.** The City shall continue to assess a water development fee on all new commercial, industrial, and residential development sufficient to fund system-wide capacity improvements. The water development fee schedule shall be periodically reviewed and revised as necessary.

**POLICY PF-P-13.** Ensure that all new development provides for and funds a fair share of the costs for adequate water distribution, including line extensions, easements, and plant expansions.

**POLICY PF-P-14.** The City shall continuously monitor water flows through the City's water system to identify areas of potential water loss and cases of under billing for water service and shall make improvements in the systems as necessary.

**POLICY PF-P-15.** The City shall monitor water quality regularly and take necessary measures to prevent contamination.

**POLICY PF-P-16.** The City of Manteca shall include a groundwater analysis as a technical analysis of water system capacity in the update of the Public Facilities Implementation Plan (PFIP), and shall prepare an environmental analysis in the PFIP that addresses the quality and availability of groundwater.

**POLICY PF-P-17.** The City of Manteca shall consider incremental increases in the demands on groundwater supply and water quality when reviewing development applications.

**POLICY PF-P-26.** The City shall continue to complete gaps in the drainage system in areas of existing development.

**POLICY PF-P-27.** The City shall require the dedication and improvement of drainage detention basins as a condition of development approval according to the standards of the Drainage Master Plan. The responsibility for the dedication and improvement of detention basins shall be based on the prorated share of stormwater runoff resulting from each development.

**POLICY PF-P-28.** Storm drainage systems within new development areas shall include open drainage corridors where feasible to supplement or replace an underground piped drainage system. The drainage systems would provide for short-term storm water detention, storm water conveyance for storm waters exceeding a 10-year event, storm water quality treatment, bike and pedestrian paths, and visual open space within neighborhoods. The width and length of the corridors would be determined by the stormwater management requirements. The drainage systems would provide a pedestrian connection between parks and access to open space from residential neighborhoods. The neighborhoods would be designed with homes oriented to, rather than backing on the open space corridor.

### **Resource Conservation Element**

**POLICY RC-P-1.** The City shall continue to implement water conservation standards for all commercial and industrial development, and for all existing and new residential development.

**POLICY RC-P-2.** The City shall explore potential uses of treated wastewater when such opportunities become available.

**POLICY RC-P-3.** The City shall protect the quantity of Manteca's groundwater.

## 5.0 CONSERVATION AND NATURAL RESOURCES

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**POLICY RC-P-4.** The City shall require water conservation in both City operations and private development to minimize the need for the development of new water sources.

**POLICY RC-P-5.** Development of private water wells within the city limits shall be allowed only where the City makes a finding that municipal water service is not readily and feasibly available, and such private well systems shall only be allowed to be used until such time as City water service becomes available.

**POLICY RC-P-10.** Minimize soil erosion and loss of topsoil from land development activities, wind, and water flow.

**POLICY RC-P-11.** Minimize sedimentation and loss of topsoil from soil erosion.

**POLICY RC-P-12.** Minimize pollution of waterways and other surface water bodies from urban runoff.

**POLICY RC-P-13.** Protect the quality of Manteca's groundwater.

**POLICY RC-P-14.** Encourage participation by the County and surrounding communities in a basin-wide groundwater management study.

**POLICY RC-P-15.** Once sewer service has been extended to incorporated areas, new septic tanks shall not be permitted.

### ENVIRONMENTAL SETTING

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#### Regional Hydrology

San Joaquin County is located in the San Joaquin River watershed. The San Joaquin River is about 300 miles long. It begins in the Sierra Nevada mountain range on California's eastern border. The river runs down the western slope of the Sierra and flows roughly northwest through the Central Valley, to where it meets the Sacramento River at the Sacramento-San Joaquin Delta, a 1,000-square-mile maze of channels and islands that drains more than 40 percent of the state's lands (SJRG 2013).

Because the Central Valley receives relatively little rainfall (12 to 17 inches a year, falling mostly October through March), snowmelt runoff from the mountains is the main source of fresh water in the San Joaquin River. Over its 300-mile length, the San Joaquin River is fed by many other streams and rivers, most notably the Stanislaus, Tuolumne, and Merced Rivers.

Most of the surface water in the upper San Joaquin River is stored and diverted at Millerton Lakes' Friant Dam, near Fresno. From Friant Dam, water is pumped north through the Madera Canal and south through the Friant-Kern canal to irrigation districts and other water retailers, which then deliver the water directly to the end users in the southern portion of the watershed.

In the central and northern portions of the watershed, many agricultural and municipal users receive water from irrigation districts, such as the Modesto, Merced, Oakdale, South San Joaquin and Turlock Irrigation Districts. That water is provided through diversions from rivers that are tributary to the San Joaquin, such as the Mokelumne, Stanislaus, Tuolumne and Merced Rivers.

In an average year, about 1.5 million acre-feet of water is diverted from the San Joaquin River at Friant Dam, leaving little flow in the river until the Merced River joins the San Joaquin northwest of the City of Merced. Additional water also reaches the river via flows returning to the river from municipal

wastewater treatment plants, as well as urban and agricultural runoff. The rest of the area’s water supply needs are met by importing water from northern California (via the Central Valley Project) and by pumping water from the groundwater basin (SJRG 2013).

**Climate**

The SJVAB has an inland Mediterranean climate with warm, dry summers and cooler winters. The average daily maximum temperature in the Basin is 65 degrees Fahrenheit (°F), with average temperature highs of 95 °F in July. Average daily minimum temperature is 48 °F, with average temperature lows of 45 °F in January. Normal rainfall level is approximately 9 inches per year, and occurs mainly in the winter months from November to April. Thunderstorms occur on approximately three to four days in the spring, on average.

San Joaquin County has warm, dry days and relatively cool nights, with clear skies and limited rainfall. Winters are mild with light rains and frequent heavy fog from December to January.

In summer, high temperatures often exceed 100 degrees, with averages in the low 90’s in the northern valley and the high 90’s in the southern valley. Summer low temperatures average in the high 50’s in the northern valley and the upper 60’s in the southern valley. The northern end of the Valley (Manteca and Stockton area) receives approximately 20 inches of rain per year. The central portion of the Valley (Fresno area) receives approximately 10 inches of rain per year. The southern end of the Valley (Bakersfield area) receives less than 6 inches of rain per year.

**Watersheds**

A watershed is a region that is bound by a divide that drains to a common watercourse or body of water. Watersheds serve an important biological function, oftentimes supporting an abundance of aquatic and terrestrial wildlife including special-status species and anadromous and native local fisheries. Watersheds provide conditions necessary for riparian habitat.

The State of California uses a hierarchical naming and numbering convention to define watershed areas for management purposes. This means that boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. Table 5.7-1 shows the primary watershed classification levels used by the State of California. The second column indicates the approximate size that a watershed area may be within a particular classification level, although variation in size is common.

**TABLE 5.7-1. STATE OF CALIFORNIA WATERSHED HIERARCHY NAMING CONVENTION**

<i>WATERSHED LEVEL</i>	<i>APPROXIMATE SQUARE MILES (ACRES)</i>	<i>DESCRIPTION</i>
Hydrologic Region (HR)	12,735 (8,150,000)	Defined by large-scale topographic and geologic considerations. The State of California is divided into ten HRs.
Hydrologic Unit (HU)	672 (430,000)	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage, among others.
Hydrologic Area (HA)	244 (156,000)	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-Area (HSA)	195 (125,000)	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

*SOURCE: CALIFORNIA DEPARTMENT OF WATER RESOURCES, 2012.*



### **Hydrologic Region**

San Joaquin County is located in the San Joaquin River Hydrological Region. The San Joaquin River is the principal river of the region, and all other streams of the region are tributary to it. The Mokelumne River and its tributary the Cosumnes River originate in the central Sierra Nevada, along with the more southerly Stanislaus and Tuolumne rivers. The Merced River flows from the south central Sierra Nevada and enters the San Joaquin near the City of Newman. The Chowchilla and Fresno rivers also originate in the Sierra south of the Merced River and trend westward toward the San Joaquin River. Creeks originating in the Coast Range and draining eastward into the San Joaquin River include Del Puerto Creek, Orestimba Creek, and Panoche Creek. Del Puerto Creek enters the San Joaquin near the City of Patterson, and Orestimba Creek enters north of the City of Newman. During flood years, Panoche Creek may enter the San Joaquin River or the Fresno Slough near the town of Mendota. The Kings River is a stream of the Tulare Lake Hydrologic Region, but in flood years it may contribute to the San Joaquin River, flowing northward through the James Bypass and Fresno Slough to enter near the City of Mendota. The Mud, Salt, Berrenda, and Ash Sloughs also add to the San Joaquin River, and numerous lesser streams and creeks also enter the system, originating in both the Sierra Nevada and the Coast Range. The entire San Joaquin river system drains northwesterly through the Delta to Suisun Bay (DWR 2013, pg. SJR-5).

### **Local Watersheds (Hydrologic Sub-Areas)**

Within the San Joaquin River Hydrological Region, the Planning Area is located in the Lower Lone Tree Creek, Middle Lone Tree Creek, Oakwood Lake-San Joaquin River, Town of French Camp-San Joaquin River, Walker Slough-French Camp Slough, and Walthall Slough-San Joaquin River watersheds as shown on Figure 5.7-1.

### **Groundwater Basin**

The City of Manteca is located in the Eastern San Joaquin River 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) (NSJCGB, 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, 2016), the ESJGB is in a critical condition of overdraft.

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.

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 region penetrate through the Victor formation into the Laguna formation.

The City's annual potable groundwater production has steadily increased historically, reaching a peak of 14,900 AF in 2004. Since 2006, after the commissioning of the South County Water Supply Program (SCWSP), the total groundwater pumping for the City of Manteca has ranged from 8,062 AFY to 10,374 AFY, averaging about 8,700 AFY. According to the City's 2015 UWMP, the sustainable yield of the groundwater basin is estimated to be approximately 1 acre-foot per acre per year. Although groundwater pumping in some years has exceeded that rate, as part of the SSJID's SCWSP, the City intends to limit groundwater pumping to that rate or less.

### **Local Drainage**

The City of Manteca provides and maintains a system of storm drains, detention basins, and pumping facilities as well as monitoring and control of the operations of the storm drain system. Additionally, the City enforces storm drain regulations established by the US EPA and the State of California.

The City maintains a dynamic computer model of its storm drainage system. The model was formulated as an XP-SWMM model originally developed by the US EPA. The current version was advanced by a private sector organization, XP Software, Inc. The model provides analysis over time and offers the ability to maximize the efficiency of detention basin and pump operations along with the ability to monitor and control downstream water levels to minimize flooding problems with a minimum of new capital improvements.

The South San Joaquin Irrigation District (SSJID) owns a complex network of irrigation Laterals and Drains that run throughout the City limits. These facilities deliver irrigation water to various farming operations in the region, and they convey excess irrigation water and field runoff to downstream receiving waters, specifically the San Joaquin River. The City relies on SSJID's facilities to convey its storm water runoff to the San Joaquin River.

The City and SSJID have a long-standing agreement that authorizes the City to discharge its storm water runoff into SSJID facilities for ultimate disposal to the San Joaquin River. In 1975 the City first entered into a storm drainage agreement with SSJID, and in 2006 the City renewed its drainage agreement with SSJID. Of the many requirements in the 2006 Agreement, the two most significant new requirements are that all storm water discharges into SSJID facilities must be monitored and controlled such that the capacity of SSJID's facilities is not exceeded, and that storm water quality must be controlled such that it complies with all applicable laws.

The City meets the first requirement by requiring all new development to attenuate its runoff in a storage facility before pumping it into SSJID's facilities. In addition, the City uses real-time water level monitoring stations at critical low points in the conveyance system complete with SCADA (Supervisory Control and Data Acquisition) facilities. Regarding the water quality requirement, the City is classified as a Phase II city by the State Water Resources Control Board. As such, the City, and consequently new development, is required to comply with the State Board's storm water NPDES permit for Phase II cities.

Per the City/SSJID Master Drainage Agreement, SSJID prohibits the direct discharge of storm water runoffs into its facilities. Accordingly, the City requires all new developments to attenuate its runoff in a storage facility before pumping it into SSJID's facilities. For surface attenuation facilities, there are two allowable basin types that may be used: Interim Percolation Basin or a Permanent Detention Basin.

### *FUTURE STORM WATER DRAINAGE DEMAND AND SYSTEM IMPROVEMENTS*

The 2013 SDMP provides a comprehensive planning document to guide improvement and expansion of the City's storm drainage system to meet current and future needs in a safe and reliable manner while

maintaining compliance with all applicable regulations. Five planning zones have been identified to define the capital improvements needed to serve future growth: Zones 30, 32, 34, 36 and 39. With the exception of drainage Zone 39, all drainage zones are located in the SSJID service area.

### **Stormwater Quality**

Potential hazards to surface water quality include the following nonpoint pollution problems: high turbidity from sediment resulting from erosion of improperly graded construction projects, concentration of nitrates and dissolved solids from agriculture or surfacing septic tank failures, contaminated street and lawn run-off from urban areas, and warm water drainage discharges into cold water streams.

The most critical period for surface water quality is following a rainstorm which produces significant amounts of drainage runoff into streams at low flow, resulting in poor dilution of contaminants in the low flowing stream. Such conditions are most frequent during the fall at the beginning of the rainy season when stream flows are near their lowest annual levels. Besides the greases, oils, pesticides, litter, and organic matter associated with such runoff, heavy metals such as copper, zinc, and cadmium can cause considerable harm to aquatic organisms when introduced to streams in low flow conditions.

Urban stormwater runoff was managed as a non-point discharge (a source not readily identifiable) under the Federal Water Pollution Control Amendments of 1972 (PL 92-500, Section 208) until the mid-1980's. However, since then, the Federal Environmental Protection Agency has continued to develop implementing rules which categorize urban runoff as a point source (an identifiable source) subject to National Pollution Discharge Elimination System (NPDES) permits. Rules now affect medium and large urban areas, and further rulemaking is expected as programs are developed to meet requirements of Federal water pollution control laws.

Surface water pollution is also caused by erosion. Excessive and improperly managed grading, vegetation removal, quarrying, logging, and agricultural practices all lead to increased erosion of exposed earth and sedimentation of watercourses during rainy periods. In slower moving water bodies these same factors often cause a buildup of siltation, which ultimately reduces the capacity of the water system to percolate and recharge groundwater basins, as well as adversely affecting both aquatic resources and flood control efforts.

**303(d) Impaired Water Bodies:** Section 303(d) of the federal Clean Water Act requires States to identify waters that do not meet water quality standards or objectives and thus, are considered "impaired." Once listed, Section 303(d) mandates prioritization and development of a Total Maximum Daily Load (TMDL). The TMDL is a tool that establishes the allowable loadings or other quantifiable parameters for a waterbody and thereby the basis for the States to establish water quality-based controls. The purpose of TMDLs is to ensure that beneficial uses are restored and that water quality objectives are achieved.

According to the California Water Quality Control Monitoring Council, which is part of California Environmental Protection Agency, Natural Resources, there are many areas within the San Joaquin County which are considered Section 303(d) impaired waterbodies. Those areas in the regional vicinity of the Planning Area that are impaired are referred as Delta Waterways (Southern Portion) by the Water Quality Control Monitoring Council. This includes 3,125 acres listed as early as 1996 for Chlorpyrifos (Agriculture, Urban Runoff/Storm Sewers), DDT (Agriculture), Diazinon (Agriculture, Urban Runoff/Storm Sewers), Electrical Conductivity (Agriculture), Group A Pesticides (Agriculture), Invasive Species (Source Unknown), Mercury (Resource Extraction), and Unknown Toxicity (Source Unknown).

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### 5.8 SCENIC RESOURCES

This section provides an overview of the visual character, scenic resources, views, and scenic highways that are encountered within the Planning Area and the vicinity. For information on historical structures and resources see Section 5.1 (Cultural and Historic Preservation).

#### KEY TERMS

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**Scenic Highway Corridor.** The area outside of a highway right-of-way that is generally visible to persons traveling on the highway.

**Scenic Highway/Scenic Route.** A highway, road, drive, or street that, in addition to its transportation function, provides opportunities for the enjoyment of natural and human-made scenic resources and access or direct views to areas or scenes of exceptional beauty (including those of historic or cultural interest). The aesthetic values of scenic routes often are protected and enhanced by regulations governing the development of property or the placement of outdoor advertising. Until the mid-1980's, General Plans in California were required to include a Scenic Highways Element.

**View Corridor.** A view corridor is a highway, road, trail, or other linear feature that offers travelers a vista of scenic areas within a city or county.

#### REGULATORY FRAMEWORK

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##### *STATE*

#### **California Department of Transportation – California Scenic Highway Program**

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. The State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code. A list of California's scenic highways and map showing their locations may be obtained from the Caltrans Scenic Highway Coordinators. If a route is not included on a list of highways eligible for scenic highway designation in the Streets and Highways Code Section 263 et seq., it must be added before it can be considered for official designation. A highway may be designated scenic depending on the extent of the natural landscape that can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

##### *LOCAL*

#### **City of Manteca Zoning Ordinance**

Chapter 17.48, Landscaping, of the City Zoning Ordinance contains standards and provisions related to landscaping design requirements. The primary intent of Chapter 17.48, Landscaping, is to require water efficient landscaping and to promote water conservation. However, this chapter also includes provisions related to landscape design. These applicable provisions include parking lot landscaping design standards, setback area landscaping standards, and landscaping standards adjacent to fences and walls.

Chapter 17.50, Lighting, of the City Zoning Ordinance contains standards and provisions related to exterior lighting. The primary purpose of this chapter is to regulate lighting to balance the safety and

security needs for lighting with the City's desire to preserve dark skies and to ensure that light trespass and glare have negligible impacts on surrounding property (especially residential) and roadways. Section 17.50.070 requires the preparation of an outdoor lighting plan as part of each Site Plan and Design Review application. At a minimum, the outdoor lighting plan shall include the following:

1. Manufacturer specifications sheets, cut sheets, and other manufacturer-provided information for all proposed outdoor light fixtures to show fixture diagrams and outdoor light output levels.
2. The proposed location, mounting height, and aiming point of all outdoor lighting fixtures.
3. If building elevations are proposed for illumination, drawings of all relevant building elevations showing the fixtures, the portions of the elevations to be illuminated, the illumination level of the elevations, and the aiming point for any remote light fixture.
4. Photometric data including a computer-generated photometric grid showing foot-candle readings every 10 feet within the property or site and 10 feet beyond the property lines.

## ENVIRONMENTAL SETTING

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### Regional Scenic Resources

Visual resources are generally classified into two categories: scenic views and scenic resources. Scenic views are elements of the broader viewshed such as mountain ranges, valleys, and ridgelines. They are usually mid-ground or background elements of a viewshed that can be seen from a range of viewpoints, often along a roadway or other corridor. Scenic resources are specific features of a viewing area (or viewshed) such as trees, rock outcroppings, and historic buildings. They are specific features that act as the focal point of a viewshed and are usually foreground elements.

Aesthetically significant features occur in a diverse array of environments within the region, ranging in character from urban centers to rural agricultural lands to natural water bodies. Features of the built environment that may also have visual significance include individual or groups of structures that are distinctive due to their aesthetic, historical, social, or cultural significance or characteristics. Examples of the visually significant built environment may include bridges or overpasses, architecturally appealing buildings or groups of buildings, landscaped freeways, and a location where a historic event occurred.

### Scenic Highways and Corridors

Scenic highways and corridors make major contributions to the quality of life enjoyed by the residents of a region. The development of community pride, the enhancement of property values, and the protection of aesthetically-pleasing open spaces reflecting a preference for the local lifestyle are all ways in which scenic corridors are valuable to residents.

Scenic highways and corridors can also strengthen the tourist industry. For many visitors, highway corridors will provide their only experience of the region. Enhancement and protection of these corridors ensures that the tourist experience continues to be a positive one and, consequently, provides support for the tourist-related activities of the region's economy.

**Scenic Highways:** A scenic highway is generally defined by Caltrans as a public highway that traverses an area of outstanding scenic quality, containing striking views, flora, geology, or other unique natural attributes. A highway may be designated scenic depending upon how much of the natural landscape can

## 5.0 CONSERVATION AND NATURAL RESOURCES

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be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

Only one highway section in San Joaquin County is listed as a Designated Scenic Highway by the Caltrans Scenic Highway Mapping System; the segment of State Route 580 from Interstate 5 to State Route 205. This route traverses the edge of the Coast Range to the west and Central Valley to the east. The City of Manteca is not visible from this roadway segment.

**Scenic Corridors:** A scenic corridor is the view from the road that may include a distant panorama and/or the immediate roadside area. A scenic corridor encompasses the outstanding natural features and landscapes that are considered scenic. It is the visual quality of the man-made or natural environments within a scenic corridor that are responsible for its scenic value. Commonly, the physical limits of a scenic corridor are broken down into foreground views (zero to one quarter mile) and distant views (over one quarter mile). In addition to distinct foreground and distant views, the visual quality of a scenic corridor is defined by special features, which include:

- Focal points - prominent natural or man-made features which immediately catch the eye.
- Transition areas - locations where the visual environment changes dramatically.
- Gateways - locations which mark the entrance to a community or geographic area.

The City of Manteca General Plan does not designate any scenic corridors or viewsheds. As identified in the Open Space Element of the San Joaquin County General Plan, designated scenic routes in the county include Interstate 5 from the Sacramento County line south to Stockton. The City of Manteca is located south of Stockton, and Manteca is not visible from this segment of Interstate 5.

### Other Scenic Resources Areas

**Water Resources:** Water resources are important visual resources that draw tourists to the area for recreational opportunities, provide critical habitat, and provide for scenic areas within and surrounding urban areas. The most visually significant water body in the region is the San Joaquin River located west of Manteca.

**Agricultural Resources:** Much of the undeveloped land within the City Limits, SOI, and areas surrounding the urbanized portion of Manteca is predominantly farmland, including alfalfa, orchards, row crops, and pasture. Agricultural lands have become important visual resources that contribute to the community identity of Manteca, and the Valley Region. Agricultural lands provide for visual relief from urbanized areas and act as community separators to nearby urban areas.

### REFERENCES

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## 5.9 AGRICULTURAL RESOURCES

This section provides an overview of the agricultural crops in San Joaquin County and the City of Manteca. Information in this section is derived primarily from the California Important Farmlands Map (California Department of Conservation, 2014), the California Land Conservation (Williamson) Act Status Report (California Department of Conservation, 2016), the San Joaquin County Agricultural Report (San Joaquin County Agricultural Commissioner, 2014-2015), and the Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS, 2016).

### REGULATORY FRAMEWORK

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#### *FEDERAL*

#### **Farmland Protection Policy Act**

The Farmland Protection Policy Act (FPPA) is intended to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. It ensures that, to the extent practicable, federal programs are compatible with state and local units of government as well as private programs and policies to protect farmland. Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a federal agency or with assistance from a federal agency. For the purpose of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for crop production. In fact, the land can be forest land, pastureland, cropland, or other land but does not include water bodies or land developed for urban land uses (i.e., residential, commercial, or industrial uses).

The Natural Resource Conservation Service (NRCS) administers the Farmland Protection Program. NRCS uses a land evaluation and site assessment (LESA) system to establish a farmland conversion impact rating score on proposed sites of federally funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level. The assessment is completed on form AD-1006, Farmland Conversion Impact Rating. The sponsoring agency completes the site assessment portion of the AD-1006, which assesses non-soil related criteria such as the potential for impact on the local agricultural economy if the land is converted to non-farm use and compatibility with existing agricultural use.

#### *STATE*

#### **Williamson Act**

The California Land Conservation Act of 1965, commonly known as the Williamson Act, was established based on numerous State legislative findings regarding the importance of agricultural lands in an urbanizing society. Policies emanating from those findings include those that discourage premature and unnecessary conversion of agricultural land to urban uses and discourage discontinuous urban development patterns, which unnecessarily increase the costs of community services to community residents.

The Williamson Act authorizes each County to establish an agricultural preserve. Land that is within the agricultural preserve is eligible to be placed under a contract between the property owner and County that would restrict the use of the land to agriculture in exchange for a tax assessment that is based on the yearly production yield. The contracts have a 10-year term that is automatically renewed each year,



unless the property owner requests a non-renewal or the contract is cancelled. If the contract is cancelled the property owner is assessed a fee of up to 12.5 percent of the property value.

### **Farmland Security Zones**

In 1998 the state legislature established the Farmland Security Zone (FSZ) program. FSZs are similar to Williamson Act contracts, in that the intention is to protect farmland from conversion. The main difference however, is that the FSZ must be designated as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance. The term of the contract is a minimum of 20 years. The property owners are offered an incentive of greater property tax reductions when compared to the Williamson Act contract tax incentives; the incentives were developed to encourage conservation of prime farmland through FSZs. The non-renewal and cancellation procedures are similar to those for Williamson Act contracts.

### **California Government Code Section 560643**

This section of the Government Codes defines “Prime agricultural land” as follows:

- Prime agricultural land means an area of land, whether a single parcel or contiguous parcels, that has not been developed for a use other than an agricultural use and that meets any of the following qualifications:
  - Land that qualifies, if irrigated, for rating as class I or class II in the USDA Natural Resources Conservation Service land use capability classification, whether or not land is actually irrigated, provided that irrigation is feasible.
  - Land that qualifies for rating 80 through 100 Storie Index Rating.
  - Land that supports livestock used for the production of food and fiber and that has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture in the National Range and Pasture Handbook, Revision 1, December 2003.
  - Land planted with fruit or nut-bearing trees, vines, bushes, or crops that have a nonbearing period of less than five years and that will re-turn during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than four hundred dollars (\$400) per acre.
  - Land that has returned from the production of unprocessed agricultural plant products an annual gross value of not less than four hundred dollars (\$400) per acre for three of the previous five calendar years.

### *LOCAL*

### **City of Manteca General Plan**

The existing City of Manteca General Plan Resources Conservation Element provides a policy framework for the preservation and conservation of agricultural resources. General Plan agricultural policies and implementation measures are identified below:

***Resource Conservation Element***

**POLICY RC-P-19.** The City shall support the continuation of agricultural uses on lands designated for urban use, until urban development is imminent.

**POLICY RC-P-20.** The City shall provide an orderly and phased development pattern so that farmland is not subjected to premature development pressure.

**POLICY RC-P-21.** In approving urban development near existing agricultural lands, the City shall take actions so that such development will not unnecessarily constrain agricultural practices or adversely affect the viability of nearby agricultural operations.

**POLICY RC-P-23.** Protect designated agricultural lands, without placing an undue burden on agricultural landowners.

**POLICY RC-P-24.** Provide buffers at the interface of urban development and farmland; in order to minimize conflicts between these uses.

**POLICY RC-P-25.** The City shall ensure, in approving urban development near existing agricultural lands, that such development will not unnecessarily constrain agricultural practices or adversely affect the economic viability of nearby agricultural operations.

**POLICY RC-P-28.** The City shall not extend water and sewer lines to premature urban development that would adversely affect agricultural operations.

**POLICY RC-P-30.** The City of Manteca will participate in a county-wide program to mitigate the conversion of Prime Farmland and Farmlands of Statewide Importance to urban uses.

IMPLEMENTATION RC-I-30. Apply the following conditions of approval where urban development occurs next to farmland.

- Require notifications in urban property deeds that agricultural operations are in the vicinity, in keeping with the City's right-to-farm ordinance.
- Require adequate and secure fencing at the interface of urban and agricultural use.
- Require phasing of new residential subdivisions; so as to include an interim buffer between residential and agricultural use.

**City of Manteca Agricultural Mitigation Fee Program**

Chapter 13.42 of the Municipal Code establishes the City's Agricultural Mitigation Fee Program, which authorizes the collection of development impact fees to offset costs associated with the loss of productive agricultural lands converted for urban uses within the City. Agricultural mitigation fees are required to be paid prior to issuance of any building permit. Fees are used to protect agricultural lands planned for agricultural use. Fees collected under Chapter 13.42 may be used as fair compensation for farmland conservation easements or farmland deed restrictions that conserve existing agricultural land.

**City of Manteca Right to Farm Ordinance**

Chapter 8.24 of the Municipal Code establishes the City's "Right to Farm" ordinance, which is intended to protect agricultural uses in the City. The ordinance establishes the City's policy to preserve, protect and encourage the use of viable agricultural land for the production of food and other agricultural

products. Chapter 8.24 identifies that when nonagricultural land uses extend into or approach agricultural areas, conflicts may arise between such land uses and agricultural operations that often result in the involuntary curtailment or cessation of agricultural operations, and discourage investment in such operations.

Chapter 8.24 of the City's Municipal Code is intended to reduce the occurrence of such conflicts between nonagricultural and agricultural land uses within the City through requiring the transferor of any property in the City to provide a disclosure statement describing that the City permits agricultural operations, including those that utilize chemical fertilizers and pesticides. The disclosure statement notifies the purchaser that the property being purchased may be located close to agricultural lands and operations and that the purchaser may be subject to inconvenience or discomfort arising from the lawful and proper use of agricultural chemical and pesticides and from other agricultural activities, including without limitation, cultivation, plowing, spraying, irrigation, pruning, harvesting, burning of agricultural waste products, protection of crops and animals from depredation, and other activities which occasionally generate dust, smoke, noise and odor. In addition, prior to issuance of a city building permit for construction of a residential building, the owner of the property upon which the building is to be constructed is required to file a disclosure statement acknowledging the proximity of agricultural operations and the potential for inconvenience or nuisance associated with those uses.

### **San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP)**

The SJMSCP provides comprehensive measures for compensation and avoidance of impacts on various biological resources, which includes ancillary benefits to agricultural resources. For instance, many of the habitat easements that are purchased or facilitated by the SJMSCP program are targeted for the protection of Swainson's hawk or other sensitive species habitat that are dependent on agricultural lands. The biological mitigation for these species through the SJMSCP includes the purchase of certain conservation easements for habitat purposes; however, the conservation easements are placed over agricultural land, such as alfalfa and row crops (not vines or orchards). As such, SJMSCP fees paid to SJCOG as administrator of the SJMSCP will result in the preservation of agricultural lands in perpetuity.

## ENVIRONMENTAL SETTING

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### **San Joaquin County Agriculture**

San Joaquin County occupies a central location in California's vast agricultural heartland, the San Joaquin Valley. The County's Agricultural Commissioner's most recent published Agricultural Reports (2014 and 2015) contains the following information relating to agriculture in the county.

San Joaquin County has a total land area of 1,391 square miles. The total acreage of crop land in the county is approximately 784,800. The gross value of agricultural production in San Joaquin County for 2015 was \$2,732,917,000, which represents a 15.5 percent decrease from 2014 when gross production value totaled \$3,234,705,000. Table 5.9-1 lists the top eight commodities in San Joaquin County in 2014 and 2015.

**TABLE 5.9-1: SUMMARY COMPARISON OF CROP VALUES**

<i>PRODUCT TYPE</i>	<i>2014 VALUE IN DOLLARS</i>	<i>2015 VALUE IN DOLLARS</i>
Field Crops	\$345,345,000.00	\$277,101,000
Vegetable Crops	\$312,804,000.00	\$325,169,000
Fruit and Nut Crops	\$1,766,776,000.00	\$1,383,287,000
Nursery Products	\$96,396,000.00	\$104,820,000
Livestock and Poultry	\$122,882,000.00	\$182,513,000
Livestock and Poultry Products	\$566,300,000.00	\$435,880,000
Seed Crops	\$4,591,000.00	\$3,615,000
Apiary Products	\$19,611,000.00	20,532,000

*SOURCE: SAN JOAQUIN COUNTY AGRICULTURAL REPORT, 2014 AND 2015.*

**Agricultural Capability**

The California Department of Conservation Farmland Mapping and Monitoring Program identifies lands that have agriculture value and maintains a statewide map of these lands called the Important Farmlands Inventory (IFI). IFI classifies land based upon the productive capabilities of the land, rather than the mere presence of ideal soil conditions.

The suitability of soils for agricultural use is just one factor for determining the productive capabilities of land. Suitability is determined based on many characteristics, including fertility, slope, texture, drainage, depth, and salt content. A variety of classification systems have been devised by the state to categorize soil capabilities. The two most widely used systems are the Capability Classification System and the Storie Index. The Capability Classification System classifies soils from Class I to Class VIII based on their ability to support agriculture with Class I being the highest quality soil. The Storie Index considers other factors such as slope and texture to arrive at a rating. The IFI is in part based upon both of these two classification systems.

**Soil Capability Classification**

The Soil Capability Classification System takes into consideration soil limitations, the risk of damage when soils are used, and the way in which soils respond to treatment. Capability classes range from Class 1 soils, which have few limitations for agriculture, to Class 8 soils that are unsuitable for agriculture. Generally, as the rating of the capability classification increases, yields and profits are more difficult to obtain. A general description of soil classifications, as defined by the Natural Resources Conservation Service (NRCS) is provided in Table 5.9-2 below.

A Custom Soil Survey was completed for the Planning Area using the NRCS Web Soil Survey program. Table 5.9-3 identifies the soils and soil classifications found in the Planning Area. The NRCS Soils Map is provided on Figure 5.5-2.

## 5.0 CONSERVATION AND NATURAL RESOURCES

**TABLE 5.9-2: SOIL CAPABILITY CLASSIFICATION**

<i>CLASS</i>	<i>DEFINITION</i>
1	Soils have slight limitations that restrict their use.
2	Soils have moderate limitations that restrict choice plants or that require moderate conservation practices.
3	Soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.
4	Soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.
5	Soils are not likely to erode but have other limitations; impractical to remove that limits their use largely to pasture or range, woodland, or wildlife habitat.
6	Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife habitat.
7	Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife habitat.
8	Soils and landforms have limitations that preclude their use for commercial plans and restrict their use to recreation, wildlife habitat, water supply, or aesthetic purposes.

SOURCE: USDA SOIL CONSERVATION SERVICE.

**TABLE 5.9-3: SOIL CLASSIFICATION**

<i>UNIT SYMBOL</i>	<i>NAME</i>	<i>ACRES</i>	<i>PERCENT OF AOI</i>	<i>CAPABILITY CLASSIFICATION*</i>
108	Arents, saline-sodic, 0 to 2 percent slopes	395.45	1.47%	3-4
109	Bigani loamy coarse sand, partially drained, 0 to 2 percent slopes	515.08	1.91%	3-4
130	Columbia fine sandy loam, drained, 0 to 2 percent slopes	390.26	1.45%	2-4
131	Columbia fine sandy loam, partially drained, 0 to 2 percent slopes, occasionally flooded	14.70	0.05%	4-4
141	Delhi fine sand, 0 to 5 percent slopes	1,126.56	4.18%	3-4
142	Delhi loamy sand, 0 to 2 percent slopes, MLRA 17	3,857.41	14.31%	3-4
143	Delhi-Urban land complex, 0 to 2 percent slopes	3,626.69	13.46%	3-4
144	Dello sand, partially drained, 0 to 2 percent slopes, occasionally flooded	59.89	0.22%	3-4
145	Dello loamy sand, drained, 0 to 2 percent slopes	279.24	1.04%	3-4
150	Dumps	35.86	0.13%	8-8
152	Egbert mucky clay loam, partially drained, 0 to 2 percent slopes	23.78	0.09%	2-4
153	Egbert silty clay loam, partially drained, 0 to 2 percent slopes	84.96	0.32%	2-4
160	Galt clay, 0 to 1 percent slopes, MLRA 17	87.86	0.33%	3-3
166	Grangeville fine sandy loam, partially drained, 0 to 2 percent slopes	85.32	0.32%	2-4
169	Guard clay loam, drained, 0 to 2 percent slopes	100.71	0.37%	2-4
175	Honcut sandy loam, 0 to 2 percent slopes	416.88	1.55%	2-4

## 5.0 CONSERVATION AND NATURAL RESOURCES

<i>UNIT SYMBOL</i>	<i>NAME</i>	<i>ACRES</i>	<i>PERCENT OF AOI</i>	<i>CAPABILITY CLASSIFICATION*</i>
196	Manteca fine sandy loam, 0 to 2 percent slopes	113.20	0.42%	3-4
197	Merritt silty clay loam, partially drained, 0 to 2 percent slopes	364.64	1.35%	2-4
254	Timor loamy sand, 0 to 2 percent slopes	2,020.36	7.50%	3-4
255	Tinnin loamy coarse sand, 0 to 2 percent slopes	7,724.89	28.66%	3-4
260	Urban land	125.55	0.47%	8-8
265	Veritas sandy loam, partially drained, 0 to 2 percent slopes	32.31	0.12%	2-4
266	Veritas fine sandy loam, 0 to 2 percent slopes	5,377.84	19.95%	2-4
284	Water	93.31	0.35%	--
--	<b>Totals</b>	<b>26,952.75</b>	<b>100.00%</b>	

*\* DEPICTS IRRIGATED VS NON IRRIGATED CAPABILITY RATING  
SOURCE: NRCS CUSTOM WEB SOIL SURVEY, 2016.*

### Important Farmlands

The Farmland Mapping and Monitoring Program (FMMP) is a farmland classification system administered by the California Department of Conservation. Important farmland maps are based on the Land Inventory and Monitoring criteria, which classify a land’s suitability for agricultural production based on both the physical and chemical characteristics of soils, and the actual land use. The system maps five categories of agricultural land, which include important farmlands (prime farmland, farmland of statewide importance, unique farmland, and farmland of local importance) and grazing land, as well as three categories of non-agricultural land, which include urban and built-up land, other land, and water area.

The State of California Department of Conservation Farmland Mapping and Monitoring Program and San Joaquin County GIS data were used to illustrate the farmland characteristics for the Planning Area. Farmlands in the Planning Area are identified in Table 5.9-4 and are shown on Figure 5.9-1. The farmland classifications for the site and surrounding area are described below.

**TABLE 5.9-4: FARMLAND CLASSIFICATION**

<i>LAND CLASSIFICATION</i>	<i>CITY</i>	<i>SOI</i>	<i>TOTAL</i>
Cl - Confined Animal Ag	29.047	65.110	94.156
D - Urban/Built Up Land	7,884.867	1,063.940	8,948.808
L - Farmland of Local Importance	570.707	328.849	899.556
nv - Nonagricultural or Natural Vegetation	4.861	32.123	36.984
P - Prime Farmland	1,095.536	3,734.146	4,829.682
R - Rural Residential	264.781	577.597	842.378
S - Farmland of Statewide Importance	3,278.122	7,390.904	10,669.026
sAC - Semi-agricultural and Rural Commercial Land	68.548	76.839	145.388
V - Vacant or Disturbed Land	189.123	120.503	309.626
W - Water		177.091	177.091
<b>Total</b>	<b>13,385.591</b>	<b>13,567.102</b>	<b>26,952.694</b>

*SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION; NRCS CUSTOM WEB SOIL SURVEY, 2016.*

## 5.0 CONSERVATION AND NATURAL RESOURCES

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### *PRIME FARMLAND*

Prime farmland is farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date. Approximately 4,829.682 acres of Prime Farmland is located within the Panning Area.

### *FARMLAND OF STATEWIDE IMPORTANCE*

Farmland of Statewide Importance is farmland with characteristics similar to those of prime farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date. Approximately 10,669.026 acres of Farmland of Statewide Importance is located within the Panning Area.

### *FARMLAND OF LOCAL IMPORTANCE*

Farmland of Local Importance is land of importance to the local agricultural economy, as determined by each county's board of supervisors and a local advisory committee. Approximately 899.556 acres of Farmland of Local Importance is located within the Panning Area.

### *URBAN AND BUILT-UP LAND*

Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes. Approximately 8,948.808 acres of Urban and Built-Up Land is located within the Panning Area.

### *RURAL RESIDENTIAL LAND*

Rural Residential Land has a building density of less than 1 structure per 1.5 acres, but with at least one structure per 10 acres. Approximately 842.378 acres of Rural Residential Land is located within the Panning Area.

### *VACANT OR DISTURBED LAND*

This consists of open field areas that do not qualify for an agricultural category, mineral and oil extraction areas, and rural freeway interchanges. Approximately 309.626 acres of Vacant or Disturbed Land is located within the Panning Area.

### *CONFINED ANIMAL AGRICULTURE*

This includes aquaculture, dairies, feedlots, and poultry facilities. Confined Animal Agriculture qualifies for Farmland of Local Importance in San Joaquin County. Approximately 94.156 acres of Confined Animal Agricultural Land is located within the Panning Area.

### *NONAGRICULTURAL AND NATURAL VEGETATION*

This covers heavily wooded, rocky or barren areas, riparian and wetland areas, grassland areas which do not qualify for Grazing Land due to their size or land management restrictions, and small water bodies. Constructed wetlands are also included in this category. Approximately 36.984 acres of Nonagricultural and Natural Vegetation Land is located within the Panning Area.

*SEMI-AGRICULTURAL AND RURAL COMMERCIAL LAND*

This includes farmsteads, agricultural storage and packing sheds, unpaved parking areas, composting facilities, equine facilities, firewood lots, and campgrounds. Approximately 145.388 acres of Semi-Agricultural and Rural Commercial Land is located within the Panning Area.

*WATER*

Water areas with an extent of at least 40 acres are mapped by the FMMP. Approximately 177.091 acres of Water Designated areas are located within the SOI.

**Farmland Conversion in San Joaquin County**

Data from the Department of Conservation indicates that approximately 762 acres of Prime Farmland in the County was developed for other uses between 2012 and 2014, resulting in an existing total of 382,877 acres of Prime Farmland (51 percent of agricultural land). The remaining agricultural land is comprised of Farmland of Statewide Importance (11 percent), Unique Farmland (10 percent), Farmland of Local Importance (10 percent), and Grazing Land (18 percent). The types and acreages of farmland in 2012 and 2014 are shown below in Table 5.9-5.

**TABLE 5.9-5: SAN JOAQUIN COUNTY FARMLANDS SUMMARY AND CHANGE BY LAND USE CATEGORY**

LAND USE CATEGORY	2012-2014 ACREAGE CHANGES							
	TOTAL ACREAGE INVENTORIED				ACRES LOST	ACRES GAINED	TOTAL	NET
	2012		2014		(-)	(+)	ACREAGE CHANGED	ACREAGE CHANGED
	Acres	Percent	Acres	Percent				
Prime Farmland	382,115	42%	382,877	42%	1,421	2,183	3,604	762
Farmland of Statewide Importance	82,160	9%	82,271	9%	378	489	867	111
Unique Farmland	72,053	8%	76,415	8%	309	4,671	4,980	4,362
Farmland of Local Importance	76,405	8%	73,429	8%	4,821	1,845	6,666	-2,976
IMPORTANT FARMLAND SUBTOTAL	612,733	67%	614,992	67%	6,929	9,188	16,117	2,259
Grazing Land	135,896	15%	132,950	15%	2,996	50	3,046	-2,946
AGRICULTURAL LAND SUBTOTAL	748,629	82%	747,942	82%	9,925	9,238	19,163	-687
Urban and Built-up Land	93,278	10%	93,888	10%	118	728	846	610
Other Land	58,925	6%	59,002	6%	483	560	1,043	77
Water Area	11,764	1%	11,764	1%	0	0	0	0
TOTAL AREA INVENTORIED	912,596	100%	912,596	100%	10,526	10,526	21,052	0

SOURCE: CA DEPARTMENT OF CONSERVATION, DIVISION OF LAND RESOURCE PROTECTION TABLE A-30, 2014.

**Farmland Conservation**

The Williamson Act authorizes each County to establish an agricultural preserve. Land that is within the agricultural preserve is eligible to be placed under a contract between the property owner and County that would restrict the use of the land to agriculture in exchange for a tax assessment that is based on the yearly production yield. The contracts have a 10-year term that is automatically renewed each year, unless the property owner requests a non-renewal or the contract is cancelled. If the contract is cancelled the property owner is assessed a fee of up to 12.5 percent of the property value.



## 5.0 CONSERVATION AND NATURAL RESOURCES

Table 5.9-6 shows lands within the city and SOI that are under a Williamson Act contract and the status of the contract. Figure 5.9-2 shows Williamson Act Contracts within the city and Planning Area. Of the 2285.647 acres of Williamson Act Contract lands, approximately 114.5 acres are in non-renewal.

**TABLE 3.9-6: SUMMARY OF WILLIAMSON ACT CONTRACTS**

<i>CONTRACT LOCATION AND TYPE</i>	<i>APN COUNT</i>	<i>TOTAL ACRES</i>
<b>City</b>	1	21.5137
WA-Non-Renewal	1	21.5137
<b>SOI</b>	68	2264.133
WA-FSZ	1	37.6947
WA-Non-Prime	43	1375.834
WA-Non-Renewal	2	92.9555
WA-Prime	22	757.6485
Total	69	2285.647

*FARMLAND MAPPING AND MONITORING PROGRAM, SAN JOAQUIN COUNTY, 2014.*

### REFERENCES

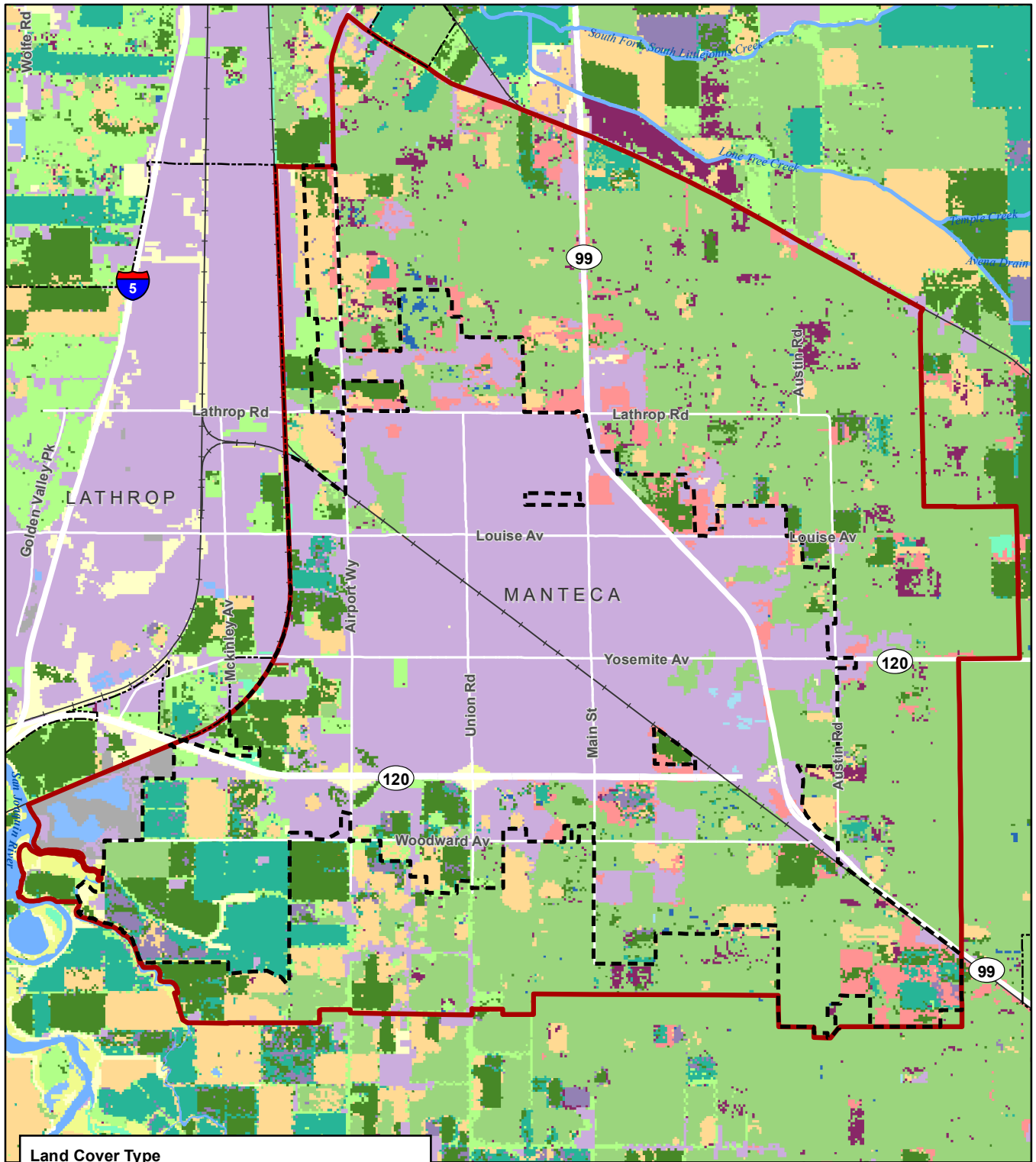
United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2016. Web Soil Survey. Available at: <http://websoilsurvey.nrcs.usda.gov>

San Joaquin County Agricultural Commission. 2014. San Joaquin County Agriculture (Crop) Report.

San Joaquin County Agricultural Commission. 2015. San Joaquin County Agriculture (Crop) Report.

California Department of Conservation. FY 2015/2016. California Land Conservation (Williamson) Act Status Report.

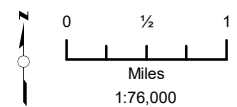
California Department of Conservation. 2014. California Important Farmlands Map. Farmland Mapping and Monitoring Program, San Joaquin County, 2014;



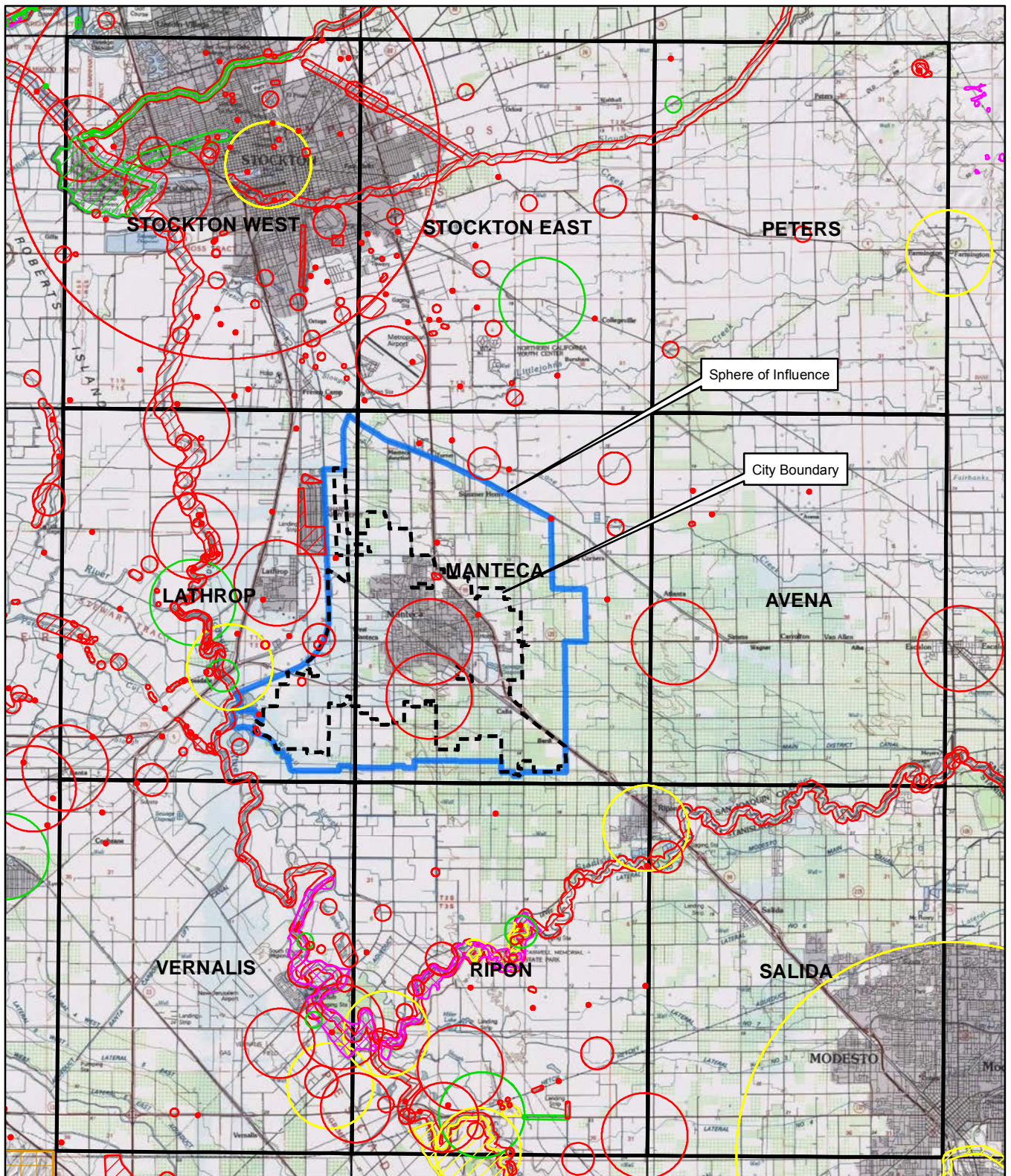
Land Cover Type	
Annual Grassland	Irrigated Hayfield
Barren	Irrigated Row and Field Crops
Cropland	Lacustrine
Deciduous Orchard	Pasture
Dryland Grain Crops	Rice
Eucalyptus	Riverine
Evergreen Orchard	Urban
Fresh Emergent Wetland	Valley Foothill Riparian
Irrigated Grain Crops	Vineyard

**CITY OF MANTECA GENERAL PLAN UPDATE**

Figure 5.2-1: Land Cover Types



Sources: FRAP Vegetation (FVEG15\_1); City of Manteca; San Joaquin County GIS.  
Map date: December 15, 2016. Revised March 21, 2017.

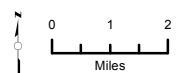


**Special Status Species Occurrences**

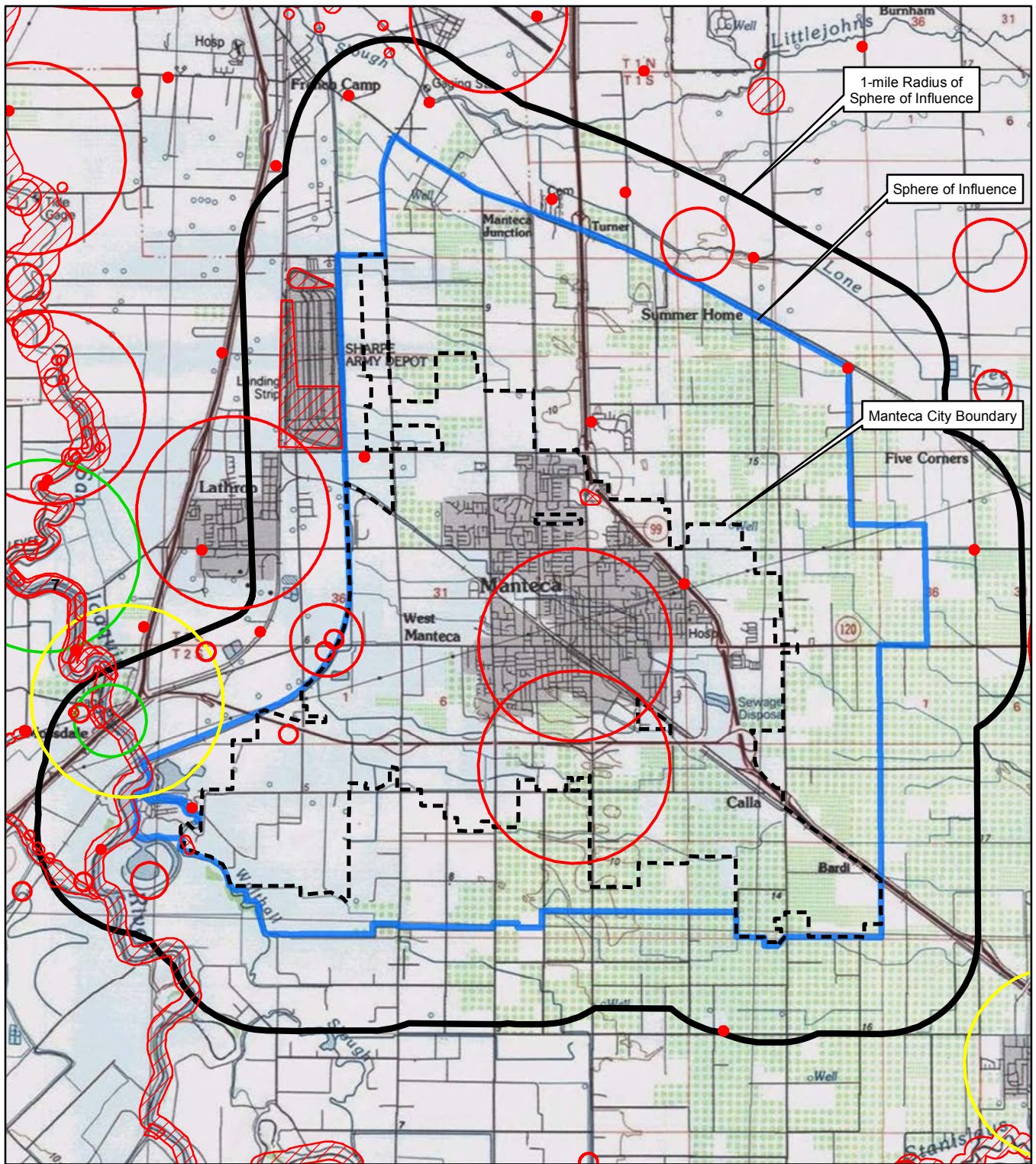
- |                      |                                  |
|----------------------|----------------------------------|
| Plant (80m)          | Animal (non-specific)            |
| Plant (specific)     | Animal (circular)                |
| Plant (non-specific) | Terrestrial Comm. (specific)     |
| Plant (circular)     | Multiple (non-specific)          |
| Animal (80m)         | Multiple (circular)              |
| Animal (specific)    | Sensitive EO's (Commercial only) |

**CITY OF MANTECA GENERAL PLAN UPDATE**

Figure 5.2-2: California Natural Diversity Database  
9-Quad Search



CNDDDB version 07/2017. Please Note: the occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not been surveyed and/or mapped. Lack of information in the CNDDDB about a species or an area can never be used as proof that no special status species occur in an area. Basemap: ArcGIS Online Topographic Map Service. Map date: July 15, 2017.



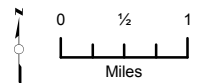
**Occurrences**

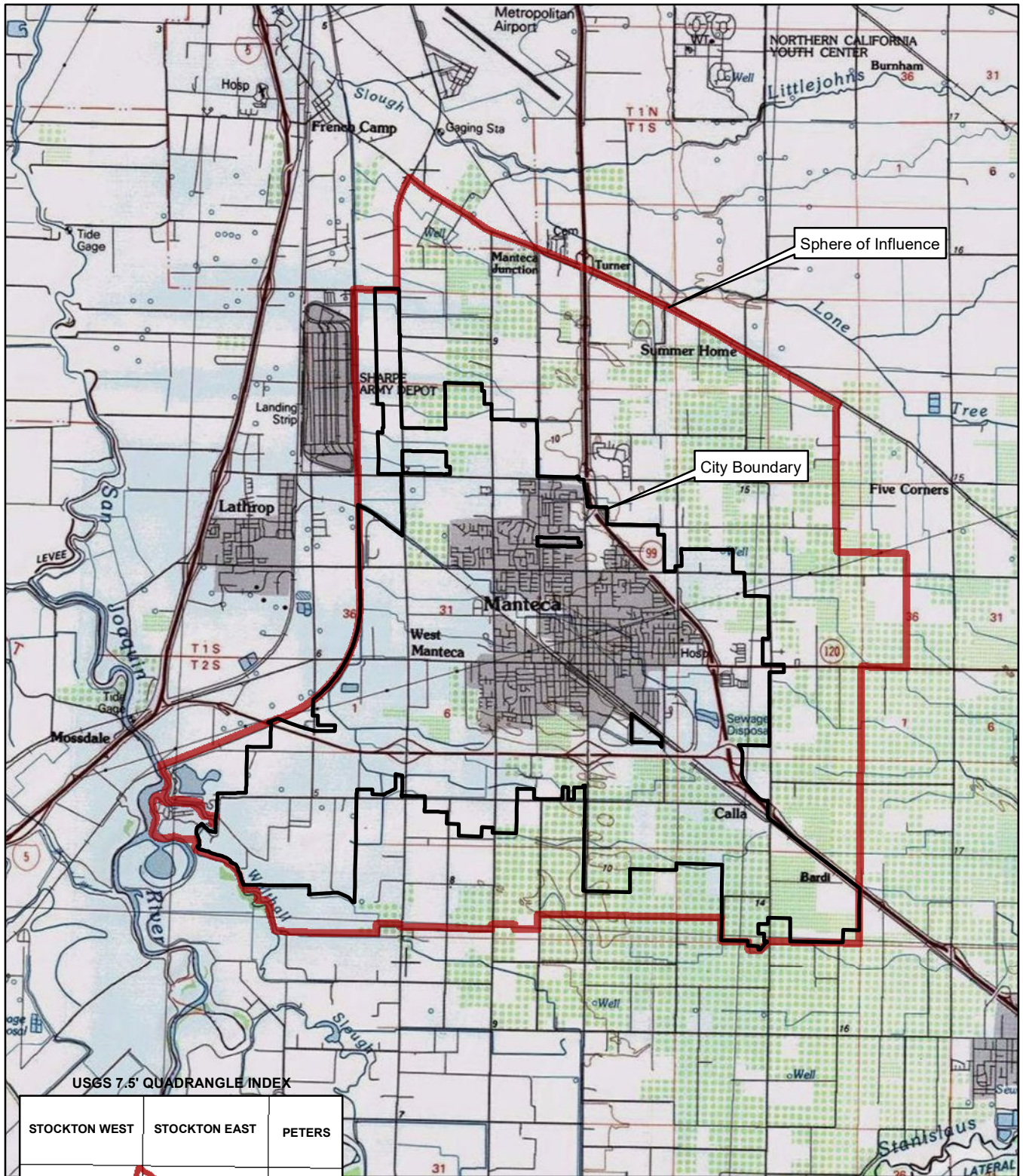
- Plant (circular)
- Animal (80m)
- Animal (specific)
- Animal (non-specific)
- Animal (circular)
- Multiple (circular)

CNDDDB version 07/2017. Please Note: the occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not been surveyed and/or mapped. Lack of information in the CNDDDB about a species or an area can never be used as proof that no special status species occur in an area. Basemap: ArcGIS Online Topographic Map Service. Map date: July 15, 2017.

**CITY OF MANTECA GENERAL PLAN UPDATE**

Figure 5.2-3: California Natural Diversity Database  
1-mile Radius Search

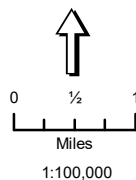




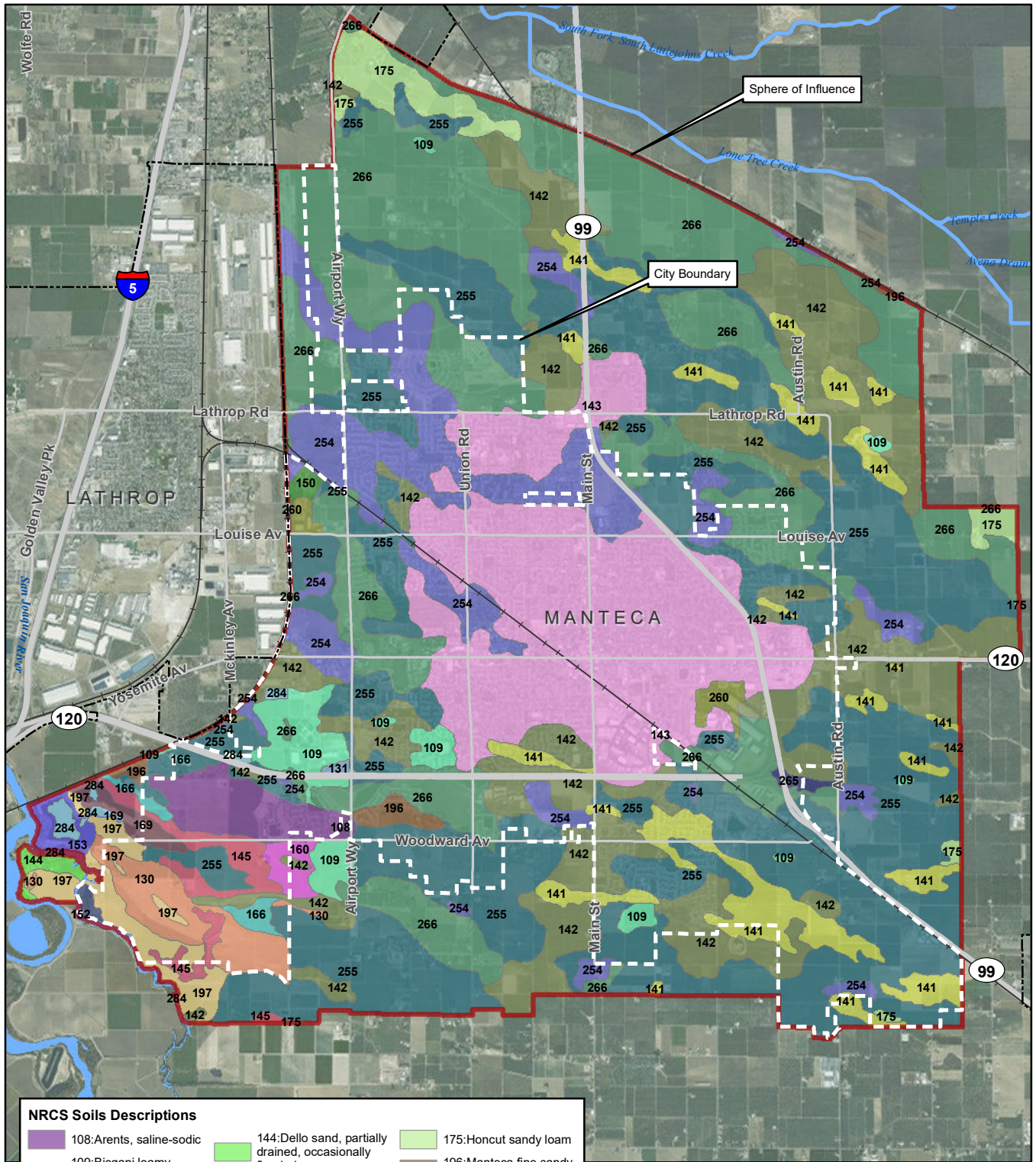
USGS 7.5' QUADRANGLE INDEX

STOCKTON WEST	STOCKTON EAST	PETERS
LATHROP	MANTECA	AVENA
VERNALIS	RIPON	SALIDA

**CITY OF MANTECA GENERAL PLAN UPDATE**  
 Figure 5.5-1: USGS Topographic Map  
 Lathrop and Manteca Quadrangles



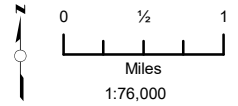
Data sources: San Joaquin County GIS; ArcGIS Online USGS Topographic Map Service. Map date: December 12, 2016.



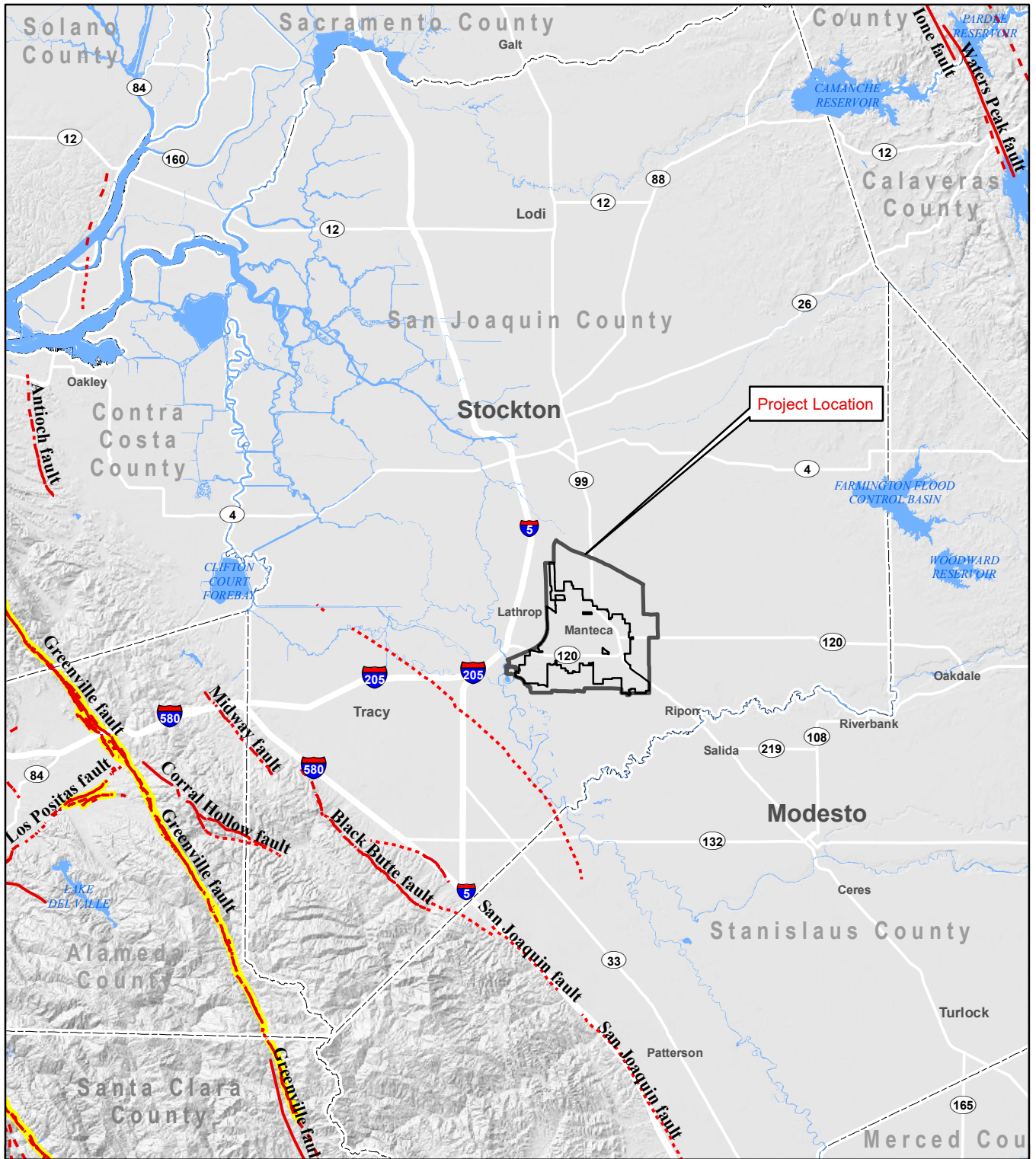
**NRCS Soils Descriptions**

108: Arents, saline-sodic	144: Dello sand, partially drained, occasionally flooded	175: Honcut sandy loam
109: Bisgani loamy coarse sand, partially drained	145: Dello loamy sand, drained	196: Manteca fine sandy loam
130: Columbia fine sandy loam, drained	150: Dumps	197: Merritt silty clay loam, partially drained
131: Columbia fine sandy loam, partially drained, occasionally flooded	152: Egbert mucky clay loam, partially drained	254: Timor loamy sand
141: Delhi fine sand	153: Egbert silty clay loam, partially drained	255: Tinnin loamy coarse sand
142: Delhi loamy sand	160: Galt clay, MLRA 17	260: Urban land
143: Delhi-Urban land complex	166: Grangeville fine sandy loam, partially drained	265: Veritas sandy loam, partially drained
	169: Guard clay loam, drained	266: Veritas fine sandy loam
		284: Water

**CITY OF MANTECA GENERAL PLAN UPDATE**  
**Figure 5.5-2: Soils Map**



Sources: NRCS Web Soil Survey, San Joaquin County, California (CA077), Survey Area Version 10, 9-28-2016. City of Manteca; San Joaquin County GIS. Map date: December 13, 2016.



**Planning Areas**

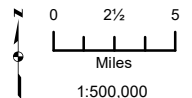
- Manteca City Limits
- Manteca Sphere of Influence

**Quaternary Faults**

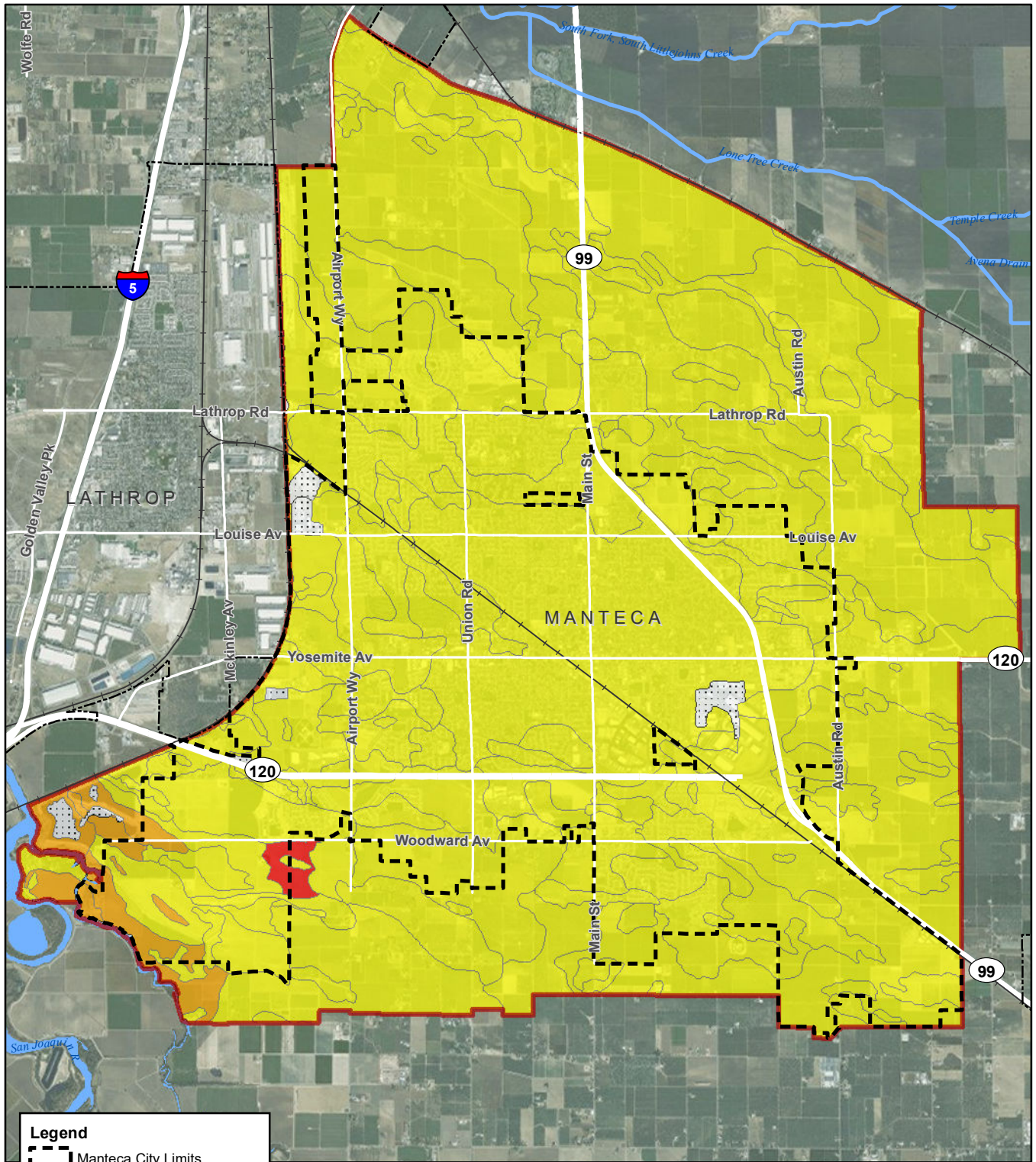
- Well-constrained
- Moderately-constrained
- Inferred
- Alquist-Priolo Fault Zones

**CITY OF MANTECA GENERAL PLAN UPDATE**

Figure 5.5-3. Earthquake Faults and Alquist-Priolo Zones



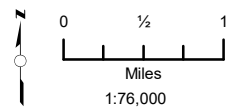
Data sources: US Geologic Survey; CalAtlas. Map date: December 12, 2016.



**Legend**

- Manteca City Limits
- Manteca Sphere of Influence
- Shrink-Swell Potential of Soils\***
- Low
- Medium
- High to Very High
- NA - Not Applicable

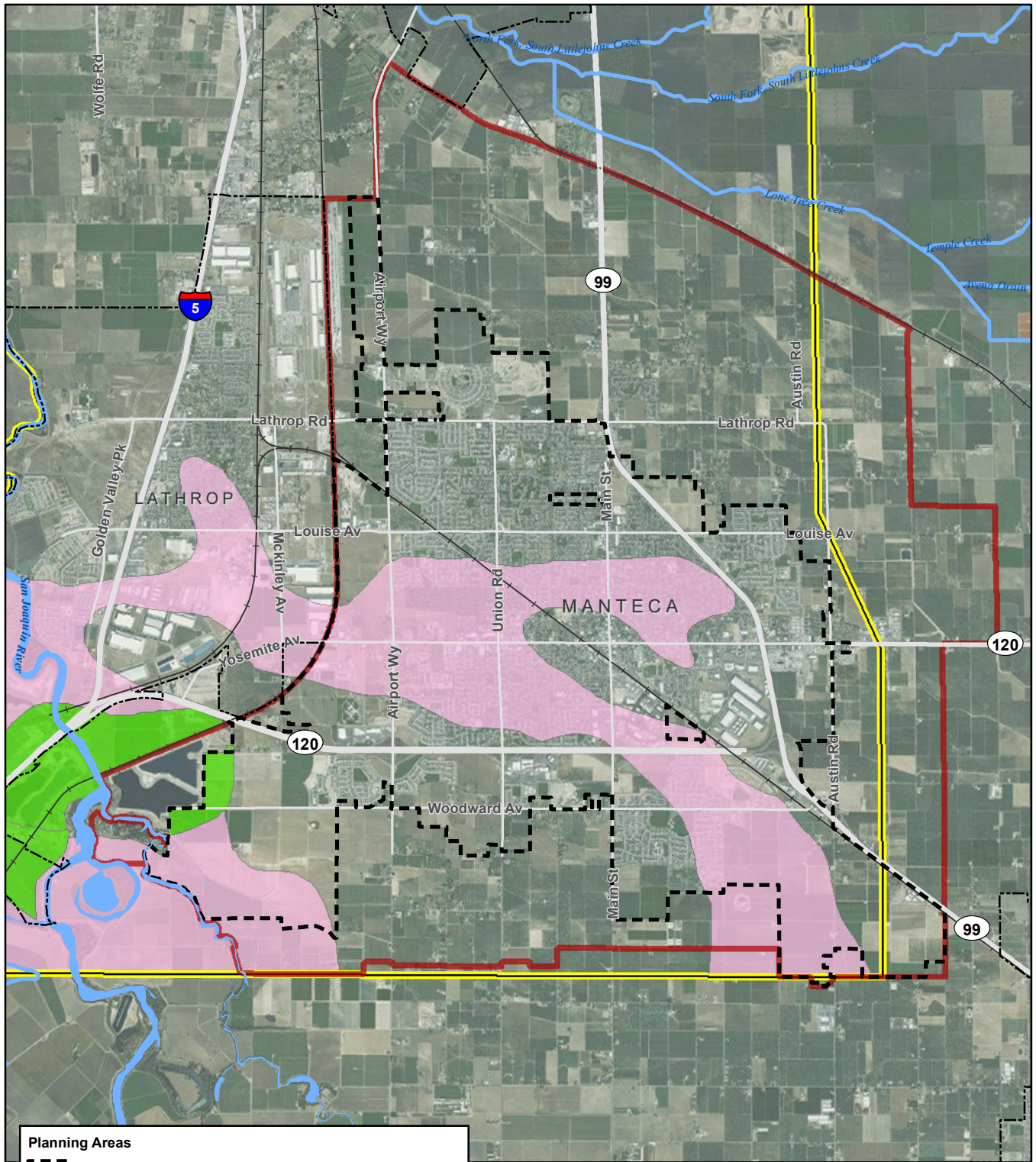
**CITY OF MANTECA GENERAL PLAN UPDATE**  
 Figure 5.5-4: Shrink-Swell Potential of Soils



\*Shrink-Swell Potential is determined by linear extensibility. Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Soils are considered to have low potential when the linear extensibility is less than 3%, moderate if 3-6%, high if 6-9%, and very high if greater than 9%.

Sources: NRCS Web Soil Survey, San Joaquin County, California (CA077), Survey Area Version 10, 9-28-2016. City of Manteca; San Joaquin County GIS. Map date: December 13, 2016.





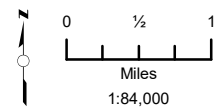
**Planning Areas**

- Manteca City Limits
- Manteca Sphere of Influence
- Stockton-Lodi Production-Consumption Region Boundary

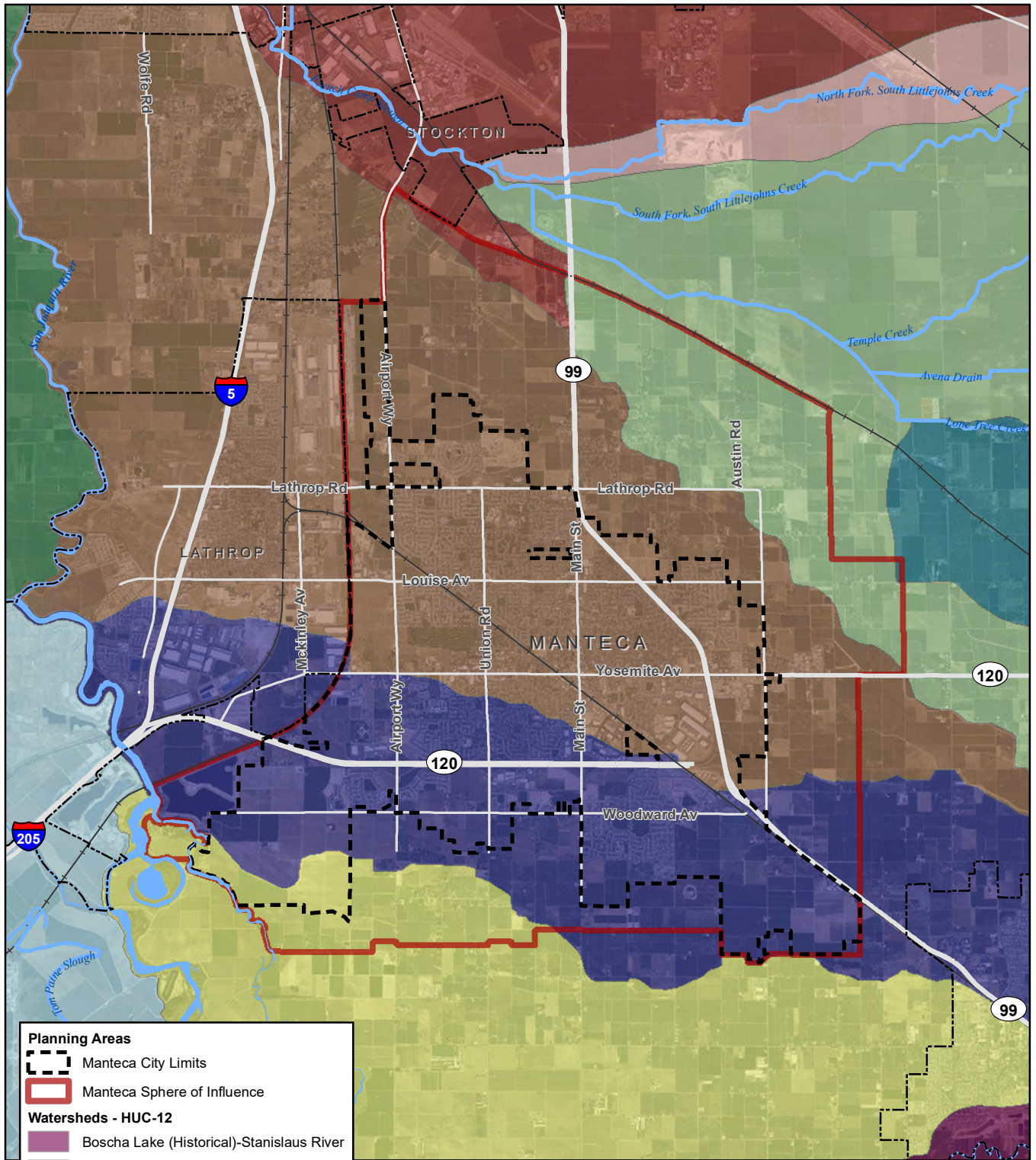
**Mineral Resource Zones**

- MRZ-2 - Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presences exists
- MRZ-3 - Areas containing mineral deposits the significance of which cannot be evaluated from available data

**CITY OF MANTECA GENERAL PLAN UPDATE**  
**Figure 5.6-1: Mineral Resource Zones**



Sources: California Geological Survey, Updated Mineral Land Classification Map for Portland Cement Concrete-Grade Aggregate in the Stockton-Lodi Production-Consumption Region, San Joaquin and Stanislaus Counties, CA, Special Report 199-Plate 1, 2012; City of Manteca; San Joaquin County GIS. Map date: December 13, 2016.



**Planning Areas**

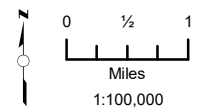
- Manteca City Limits
- Manteca Sphere of Influence

**Watersheds - HUC-12**

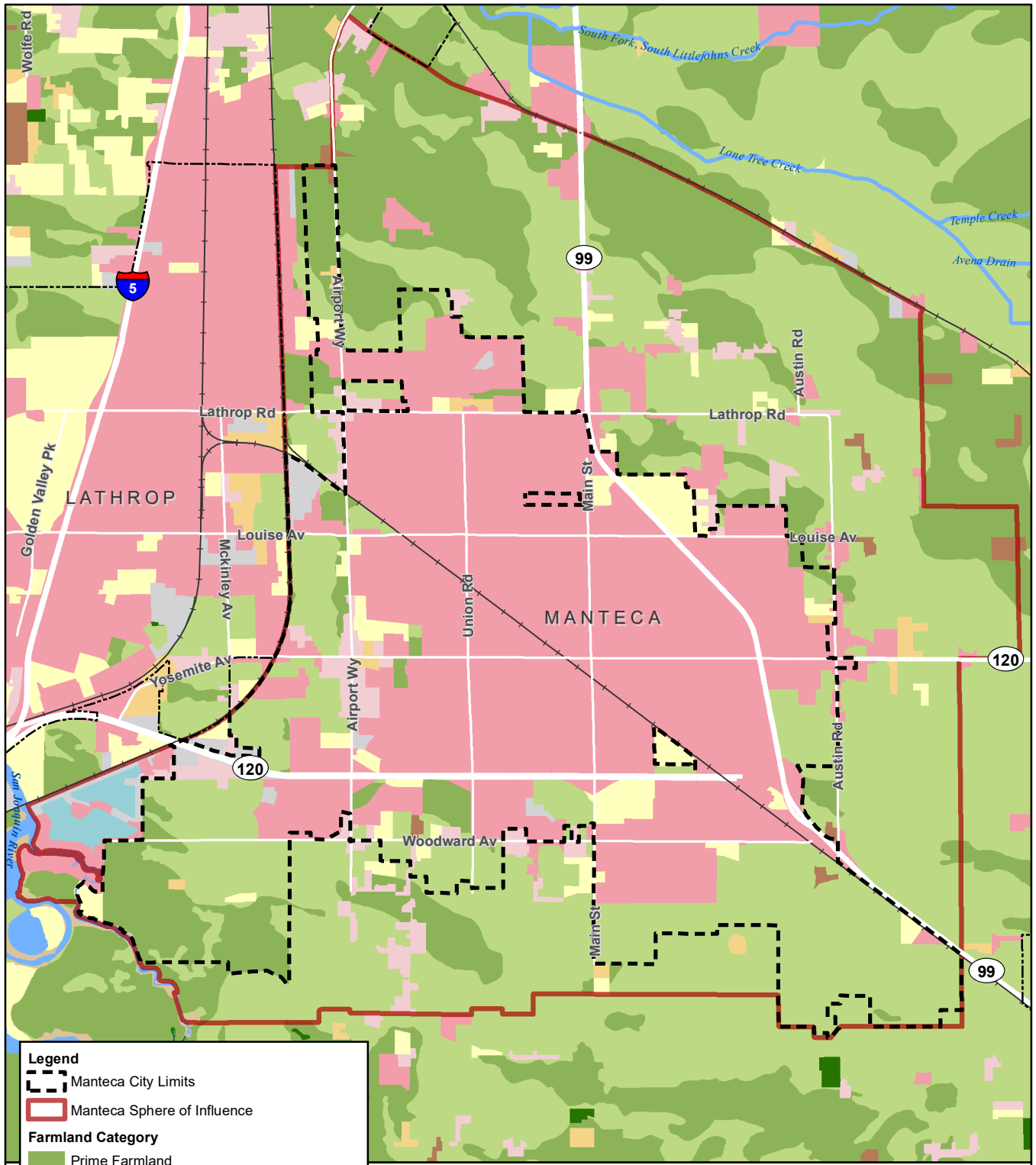
- Boscha Lake (Historical)-Stanislaus River
- Lower Lone Tree Creek
- Middle Lone Tree Creek
- Oakwood Lake-San Joaquin River
- Roberts Island-Trapper Slough
- Simmons Creek-Littlejohns Creek
- Town of French Camp-San Joaquin River
- Upper Old River
- Walker Slough-French Camp Slough
- Walthall Slough-San Joaquin River

**CITY OF MANTECA GENERAL PLAN UPDATE**

Figure 5.7-1: Watershed Map



Sources: USGS Watershed Boundary dataset; City of Manteca; San Joaquin County Map date: December 12, 2016.



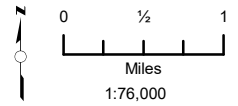
**Legend**

- Manteca City Limits
- Manteca Sphere of Influence

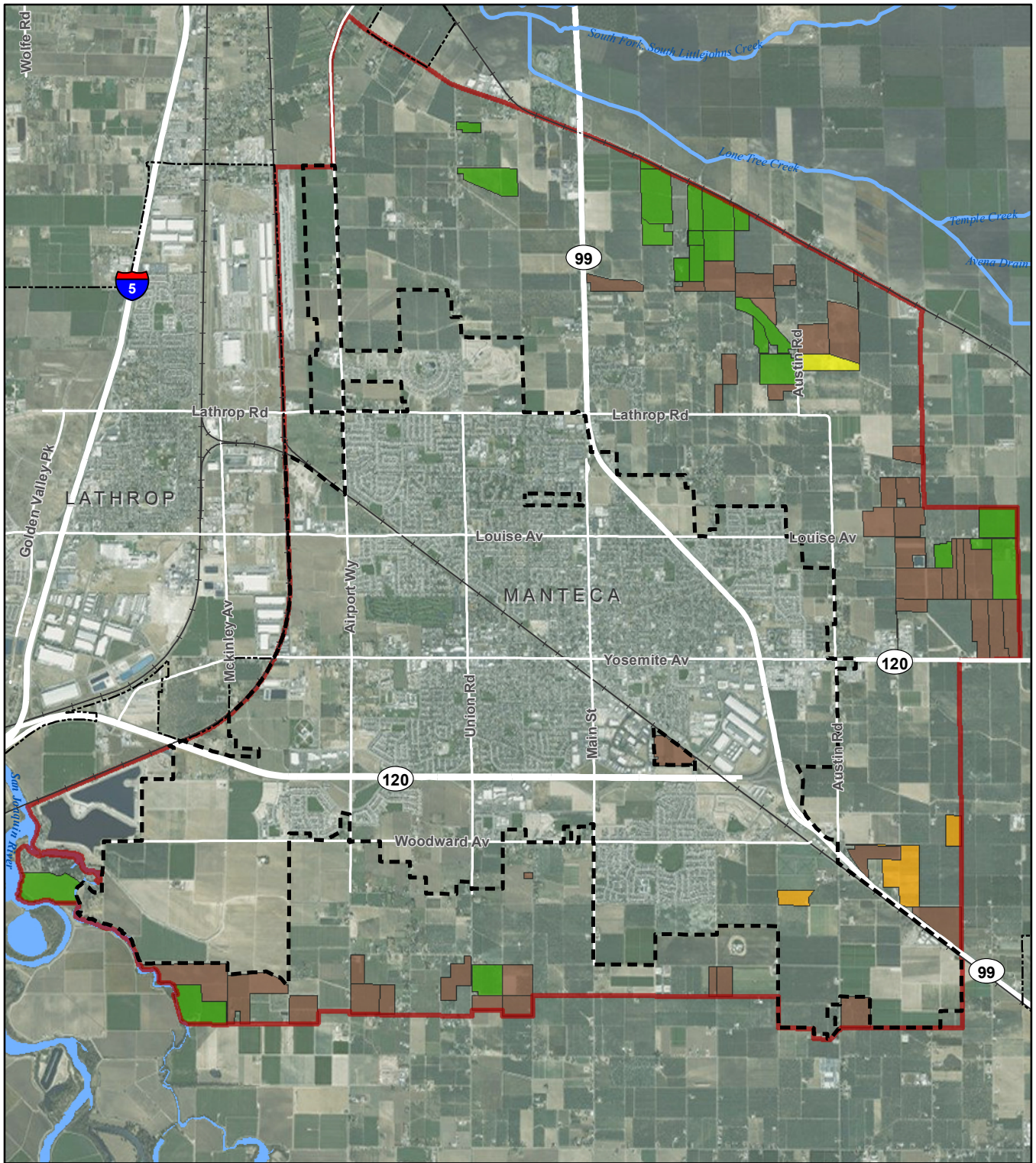
**Farmland Category**

- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Farmland of Local Importance
- Confined Animal Agriculture
- Nonagricultural or Natural Vegetation
- Vacant or Disturbed Land
- Rural Residential Land
- Semi-agricultural and Rural Commercial Land
- Urban and Built-Up Land
- Water Area

**CITY OF MANTECA GENERAL PLAN UPDATE**  
 Figure 5.9-1: Important Farmlands



Sources: Farmland Mapping and Monitoring Program, San Joaquin County, 2014; City of Manteca; San Joaquin County GIS. Map date: December 15, 2016.

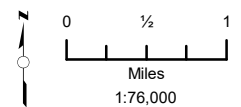


**Legend**

- Manteca City Limits
- Manteca Sphere of Influence
- Williamson Act Lands**
- Prime Agricultural Land
- Non-Prime Agricultural Land
- Farmland Security Zone
- Non-Renewal

**CITY OF MANTECA GENERAL PLAN UPDATE**

Figure 5.9-2: Williamson Act Lands



Sources: California Department of Conservation, San Joaquin County Williamson Act FY 2015/2016; City of Manteca; San Joaquin County GIS. Map date: December 15, 2016.