Volume 1 - DEIR

FRESNO METROPOLITAN WATER RESOURCES MANAGEMENT PLAN UPDATE

Draft Environmental Impact Report
SCH# 2013091021

Prepared for
City of Fresno

February 2014

ESA

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ES.1 Introduction

The City of Fresno (City) proposes to adopt and implement the Fresno Metropolitan Water Resources Management Plan Update (Metro Plan Update or proposed project). The purpose of the Metro Plan Update is to update and refine the 1996 Fresno Metropolitan Water Resources Management Plan (1996 Metro Plan) taking into consideration available new data and accommodating physical and institutional changes which have occurred since the 1996 Metro Plan was prepared. The completed Metro Plan Update would facilitate future water resource decisions and utility planning, and could assist in the pursuit of potential funding opportunities. Implementation of the City's recommended water supply plan would result in a more optimized and efficient conjunctive use of the City's available water resources, which will enhance the City's overall water supply reliability. Chapter 2 provides background on the City's existing water supply. The proposed Metro Plan Update includes near-term and future project elements including surface water treatment facilities, regional transmission facilities, groundwater facilities, potable water storage facilities, recycled water facilities, and water conservation measures. A detailed description of near-term and future project elements is described Chapter 3, Project Description.

As described in the California Environmental Quality Act (CEQA) *Guidelines* (section15121 [a]); an Environmental Impact Report (EIR) is an informational document to inform the lead agency and the public of the significant environmental effects of a project, identify possible measures to mitigate identified significant impacts, and describe reasonable alternatives to a project. The City of Fresno acting as lead agency has prepared this EIR pursuant to CEQA to analyze the potential environmental impacts of the construction and operation of the proposed Metro Plan Update. Chapter 2 provides background on the City's existing water supply.

The Metro Plan Update EIR is both a project and program EIR. As a project EIR it evaluates the environmental impacts of proposed near-term project elements consistent with *CEQA Guidelines* section15161. Future project elements are evaluated at a program level. Implementation of specific future projects will be examined in the light of this EIR to determine whether additional subsequent environmental review is required. Subsequent environmental review will focus on environmental issues specific to future projects to be implemented under the Metro Plan Update.

Inquiries about the proposed project should be directed to:

Brock Buche, Project Manager
City of Fresno Department of Public Utilities, Water Division
1910 East University Avenue
Fresno, CA 93703-2988
FresnoMetroPlan@esassoc.com

ES.2 Project Objectives

The overall objective of the City's Metro Plan Update is to provide sustainable and reliable water supplies to meet the demand of existing and future customers through 2025. The overall goals are to:

- Optimize the conjunctive use of the City's available surface water, groundwater, and recycled water supplies for direct treatment and use, and intentional groundwater recharge;
- Balance the City's groundwater operations by 2025;
- Replenish groundwater basin storage;
- Continue to implement and expand demand management/water conservation measures in compliance with the City's USBR contract and to achieve specific water conservation goals; and
- Utilize recycled water to meet in-City non-potable demands in new development areas and existing parts of the City.

ES.3 Proposed Project Summary

The Metro Plan Update proposes a comprehensive and integrated water supply plan to better manage the City's diverse water supplies, address groundwater level declines beneath the City's service area and groundwater quality concerns, and further balance and optimize the City's conjunctive use of its diversified water supply portfolio which would ultimately enhance overall water supply reliability. Key components of the proposed Metro Plan Update include:

- **Expand Demand Management and Water Conservation Measures.** Complete implementation of the on-going residential water metering program by 2013 and implementation of additional water conservation measures (at the time this Draft EIR was published the metering program had been completed).
- **Expand Use of Treated Surface Water Supplies.** Increase surface water treatment capacity by constructing and operating a new Southeast (SE) Surface Water Treatment Facility (SWTF), an expanded Northeast (NE) SWTF and potentially a new Southwest (SW) SWTF.
- **Balance In-City Groundwater Operations by 2025.** Reduce City's groundwater pumping and increase intentional groundwater recharge with a goal of balancing the City's groundwater operations within the City's service area (e.g., pumping equal to recharge) by 2025.
- **Use Recycled Water Supplies for Non-Potable Water Demands.** Maximize the direct use of recycled water for in-City non-potable water uses and thereby reduce potable water demands.

- **Assess Need and Availability of Future New Supply.** Assess the need for and timing of future new water supplies once future growth plans beyond buildout of the 2025 General Plan is determined.

The Metro Plan Update also includes:

- **Objectives, Goals and Policies.** Metro Plan Update objectives, goals and policies target conjunctive use of available groundwater and surface water supplies to optimize use of available surface water supplies; and the management of the local groundwater basin in a sustainable manner, which minimizes or eliminates localized groundwater overdraft and groundwater quality degradation.
- **Operational Principles.** The operational principals would guide conjunctive use and development of water supply operations throughout the Plan area. Specific operational principles have been developed to: (1) maximize the use of treated surface water from the City's existing and planned SWTFs in conjunction with the City's groundwater supplies; and (2) use existing and proposed groundwater recharge facilities to ensure balanced City groundwater operations by 2025.
- **Water Supply Components.** How the City intends to develop and use treated surface water, groundwater, demand management /water conservation measures, recycled water and any potential new water supplies to meet existing and future water demands.
- **Proposed Facilities.** New water supply facilities are needed to support implementation of the Metro Plan Update water supply plan and provide sufficient supplies for 2025 General Plan buildout. Facility improvements are proposed for all of the water supply components – treated surface water facilities, water transmission mains and distribution pipelines, groundwater wells, groundwater recharge basins, recycled water facilities, plus facilities to implement demand management measures such as modification of landscapes to conserve water. Facility construction would be phased based upon what is needed in the near-term and what is to be completed for 2025 General Plan buildout.
- **Proposed Near-term Projects.** Development and operation of three near-term projects would be evaluated at a project-level. Near-term projects include upgrades to the existing NE SWTF; construction of a new SE SWTF, with 80 million gallons per day (mgd) total design capacity; and regional water transmission mains and distribution pipelines located throughout the project area.

Project elements are proposed as both near-term and future projects which are described in more detail in Chapter 3, Project Description.

ES.4 Alternatives Analysis

Alternatives evaluated in this EIR, in addition to the proposed project, include: (1) No Project Alternative; (2) Alternative 1 – Canal/Pipeline Conveyance Option (3) Alternative 2 - No Relocation of Water Division Administrative Offices and Corporation Yard. As shown in Table ES-1 and as discussed in Chapter 6, Alternative 2 would be the environmentally superior alternative. This alternative would have similar but less environmental impacts when compared to the proposed project because less construction would take place due to the elimination of the relocation of water division administrative offices and corporation yard. As a result short term construction emissions of criteria pollutants and operational traffic impacts would occur and still be significant and unavoidable but they would be less in magnitude when compared to the proposed project. It would also meet all of the proposed project objectives.

TABLE ES-1
COMPARISON OF ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES COMPARED TO THE PROPOSED PROJECT

Issue Area	Proposed Project	No-Project Alternative	Alternative 1	Alternative 2
Meets Project Objectives?	Yes	No	Yes	Yes
Environmental Impacts				
4.2 Land Use and Agriculture	LS	NI	LS	LS
4.3 Geology and Soils	LS	NI	LS	LS
4.4 Hydrology and Water Quality	LS	NI	LS	LS
4.5 Biological Resources	LS	NI	LS	LS
4.6 Transportation	SU	NI	SU	SU-Less
4.7 Air Quality and Climate Change	SU	NI	SU-Less	SU-Less
4.8 Noise	LS	NI	LS	LS
4.9 Hazards and Hazardous Materials	LS	NI	LS	LS
4.10 Public Services and Utilities	LS	NI	LS	LS
4.11 Aesthetics	LS	NI	LS	LS
4.12 Cultural Resources	SU	NI	SU	SU

SU = Significant and Unavoidable Impact
LS = Less than Significant Impact
NI = No Impact
SU-Less = Significant and Unavoidable Impact but less order of magnitude than proposed project

ES.5 Potential Areas of Controversy and Concern

The City of Fresno submitted the Notice of Preparation (NOP) of this Draft EIR to the California Office of Planning and Research on September 6, 2013 (Appendix A). The NOP was distributed to local, state, and federal agencies, and to other interested parties for a 30-day review period ending October 14, 2013. During the NOP comment period two public scoping meetings were held on September 16, 2013 at the City of Fresno Department of Public Utilities Water Division Corporation Yard located at 1910 East University Avenue. The purpose of the NOP and the scoping meeting was to solicit comments from public agencies on issues germane to that agency that should be considered in the Draft EIR. Issues raised in the NOP comment letters (Appendix B) have been addressed in the Draft EIR, as appropriate and are summarized in Table ES-2.

ES.6 Summary of Impacts

Table ES-3 presents a summary of the impacts and mitigation measures identified for the proposed project. The complete impact statements and mitigation measures are presented in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. The level of significance for each impact was determined using standards of significance presented in the technical sections of Chapter 4. Significant impacts are those adverse environmental impacts that meet or exceed the standards of significance; less-than-significant impacts would not exceed the standards of significance. Table ES-3 presents: (1) environmental impacts; (2) level of significance prior to mitigation measures; (3) recommended mitigation measures; and (4) level of significance after mitigation.

TABLE ES-2
WRITTEN AND ORAL COMMENTS RECEIVED

Organization	Name	Title	Summary Comment
Written Comments			
Fresno Yosemite International Airport	Daniel Yrigollen	Airports Planning Manager	The EIR needs to incorporate a review of Federal Aviation Administration (FAA) regulations and address potential impacts to the safe navigation of aircraft at and around Fresno Yosemite International Airport and Fresno Chandler Executive Airport. Specific concerns include FAA Grant Assurance Numbers 20 and 21 which are related to airport hazard removal and mitigation and compatible land use, respectively. Concerns also include potential hazards associated with wildlife attractants and structure and equipment on or near the airports that could impact flight zones In addition, it is recommended that the City file a FAA Form 7460-1 Notice of Proposed Construction or Alteration related to the SE SWTP and associated basins as soon as possible.
Central Valley Flood Protection Board	James Herota	Staff Environmental Scientist, Projects and Environmental Branch	The proposed project should identify the Crescent Bypass, Dry Creek, Dog Creek, Globe Slough, Fresno Slough, Five Mile Slough, Kings River, James Bypass, Lower San Joaquin Flood Control Project, Sand Creek, and the San Joaquin River as being within the jurisdiction of the Central Valley Flood Protection Board. Acquire a Board permit prior to construction, if necessary. Concerns also included potential impacts to flood control from vegetation and encroachments.
Native American Heritage Commission	Dave Singleton	Program Analyst	A records search should be conducted at the appropriate Information Center to determine if the area of project effect (APE) has been previously surveyed for cultural places. Known cultural resources recorded on or adjacent to the APE should be listed in the EIR. Requests coordination with NAHC to prepare a professional report, if an additional archaeology inventory survey is required. Provided a list of appropriate Native American Contacts for consulting regarding the project site. The DEIR should include provisions for the identification and evaluation of accidentally discovered archaeological resources, recovered artifacts, and/or Native American remains pursuant to state regulations.
Fresno Irrigation District	Laurence Kimura	Assistant General Manager	Recognize that the water supplies that the City proposes to use in the future are already being used within the Fresno Irrigation District (FID) service area. If benefits within the City's footprint are discussed in the DEIR, then the impacts to the rest of the FID service area must also be discussed. Encourages the City to manage its consumption of water resources to the maximum extent possible and to be mindful of the terms and conditions of any existing agreements for water supplies. If compliance with the existing agreements is not desired, then the impacts should be evaluated. Analyze impacts to groundwater recharge from the urbanization of agricultural lands and the piping of open channels. Analyze potential operational impacts from the construction of the new SW SWTF on water demand, increase in conveyance capacity, and duration of delivery. Conduct project-level analysis for future SWTF when information is available. Determine if sufficient conveyance capacity exists for recharge facilities. Consider potential impacts to agriculture from land development. Consider comments on each phase of the Metro Plan, provided by the District. Recommends adding the California Department of Public Health to the list of regulatory requirements, permits, and approvals that will be obtained.
California Department of Transportation	Jennifer Bryan-Sanchez	Office of Transportation Planning – District 06	No comments or concerns regarding the NOP

TABLE ES-2
WRITTEN AND ORAL COMMENTS RECEIVED

Organization	Name	Title	Summary Comment
San Joaquin Valley Air Pollution Control District	David Warner	Director of Permit Services	Recommends the EIR include a discussion of criteria pollutants (construction emissions, operational emissions, and CalEEMod as the recommended model), nuisance odors, and health impacts. Also recommends including discussions of the methodology, model assumptions, inputs and results used in characterizing impacts to air quality; components and phases of the project and associated emissions; project design elements and mitigation measures; and whether the project would result in a cumulatively considerable net increase of any criteria pollutant or precursor for which the San Joaquin Valley Air Basin is non-attainment. Identify which District rules the proposed project is subject to and fulfill any needed application or permit process.

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
4.2 Land Use Planning and Agricultural Resources					
Impact 4.2.1: Implementation of the proposed project would include the construction and operation of water treatment, storage and transmission facilities that could conflict with existing and planned land uses and land use policies.	None required.	LS	NA	LS	NA
Impact 4.2.2: Implementation of the proposed project could result in the permanent conversion of land designated by the Department of Conservation FMMP as Prime Farmland, Farmland of Statewide Importance or Unique Farmland.	None required.	LS	NA	LS	NA
Impact 4.2.3: Implementation of the proposed project could result in conflicts with existing zoning for agricultural use or a Williamson Act contract.	None required.	LS	NA	LS	NA
Impact 4.2.4: Implementation of the proposed project could result in the conversion of farmland to non-agricultural uses.	None required.	LS	NA	LS	NA

TABLE ES-3
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		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.2.5: Implementation of the proposed project, when combined with development of other future projects, could make a cumulatively considerable contribution resulting in adverse impacts on agricultural resources.	None required.	LS	NA	LS	NA
4.3 Geology and Soils					
Impact 4.3.1 Proposed project facilities could be at risk of potential damage resulting from strong seismic ground shaking, or seismically-related ground failure.	**Measure 4.3.1a (NT/F):** The City shall prepare a site-specific soil and geotechnical engineering study prior to final design of individual projects under the Metro Plan Update. Each study shall be performed by a licensed professional including, but not limited to, a geologist, engineering geologist, certified soil scientist, certified agronomist, registered agricultural engineer, registered civil or structural engineer, and/or certified professional erosion and sediment control specialist with expertise in geotechnical engineering issues who is registered and/or certified in the State of California, to determine site specific impacts and to recommend site specific mitigations. The site-specific soil and geotechnical engineering studies shall be submitted to the all appropriate State and local regulatory agencies including, but not limited to, City of Fresno's Building and Safety Services Division for review and approval. All feasible recommendations addressing potential seismic hazards and soil constraints shall be implemented. **Measure 4.3.1b (NT/F):** All buildings shall conform to CBC standards for seismicity, engineered slope stability, and erosion control, as relevant. **Measure 4.3.1c (NT/F):** All pipelines shall be designed and installed consistent with the guidelines published by the American Water Works Association.	S	LS	S	LS
Impact 4.3.2 Activities associated with construction of proposed project facilities could result in substantial soil erosion or loss of topsoil.	**Measure 4.3.2 (NT/F):** Implement Mitigation Measure 4.3.1a.	LS	NA	LS	NA
Impact 4.3.3 The project could expose people to injury and structures to damage resulting from unstable soil conditions.	**Measure 4.3.3 (NT/F):** Implement Mitigation Measure 4.3.1.	S	LS	S	LS
Impact 4.3.4 Implementation of the proposed project, in combination with other development projects, could increase the risk of damage to structures due to seismically induced groundshaking and unstable soil conditions.	None required.	LS	LS	LS	LS

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		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
4.4 Hydrology and Water Quality					
Impact 4.4.1: Construction of the proposed project would involve activities that could result in increased amounts of sediment and construction equipment-related pollutants in storm water run-off that could adversely affect receiving water quality.	None required.	LS	NA	LS	NA
Impact 4.4.2: Implementation of the proposed project could adversely affect receiving water quality due to increased pollutants in surface runoff and/or accidental release of chemicals stored at project facilities.	None required.	LS	NA	LS	NA
Impact 4.4.3: The proposed project includes new and upgraded facilities that could reduce groundwater recharge potential and lower groundwater levels.	None required.	LS	NA	LS	NA
Impact 4.4.4: The proposed project would include new and upgraded facilities that would increase the rate and amount of runoff which could result in localized flooding or exceed drainage system capacity.	None required.	LS	NA	LS	NA
Impact 4.4.5: Placement of proposed project facilities in a designated flood hazard zone could impede or redirect flood flows resulting in off-site flooding and could expose facilities to damage resulting from flooding.	None required.	LS	NA	LS	NA
Impact 4.4.6: Implementation of the proposed project, when combined with construction and operation of other future projects, could adversely affect surface and groundwater quality.	None required.	LS	NA	LS	NA

TABLE ES-3
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		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.4.7: Implementation of the proposed project, when combined with implementation of other future projects, could increase rates of stormwater runoff that could exceed drainage system capacity.	None required.	LS	NA	LS	NA
Impact 4.4.8: Implementation of the proposed project, when combined with implementation of other future projects, could cumulatively contribute to increased flood elevations or redirecting or impeding flood flows increasing the risk of damage associated with flooding.	None required.	LS	NA	LS	NA
4.5 Biological Resources					
Impact 4.5.1: Implementation of the proposed project could result in potential disturbance or loss of special-status or migratory bird species and their habitats.	**Measure 4.5.1a (NT/F):** Pre-construction surveys for burrowing owls shall be conducted at any proposed project site containing suitable habitat by a qualified biologist [as approved by CDFW] within 30-days prior to the start of work activities where land construction is planned in known or suitable habitat for burrowing owls. If construction activities are delayed for more than 30 days after the initial preconstruction surveys, then a new preconstruction survey shall be required. All surveys shall be conducted in accordance with survey protocols from Appendix C and D of the *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012). **Measure 4.5.1b (NT/F):** If burrowing owls are discovered in the proposed project site vicinity during construction, the onsite biologist shall be notified immediately. Occupied burrows should not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by the CDFW verifies through non-invasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival. If this criteria is not met, occupied burrows during the nesting season will be avoided by establishment of a no-work buffer of 250-foot around the occupied/active burrow. Where maintenance of a 250-foot no-work buffer zone is not practical, the project applicant shall consult with the CDFW to determine appropriate avoidance measures. Burrows occupied during the breeding season (February 1 to August 31) will be closely monitored by the biologist until the young fledge/leave the nest. The onsite biologist shall have the authority to stop work if it is determined that construction related activities are disturbing the owls.	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	If criterion 1 or 2 above are met and as approved by CDFW, the biologist shall undertake passive relocation techniques by installing one-way doors in active and suitable burrows allowing owls to escape but not re-enter. Owls should be excluded from the immediate impact zone and within a 160-foot buffer zone by having one-way doors placed over the entrance to prevent owls from inhabiting those burrows. Outside of the nesting season (August 31 through January 31st), passive relocation techniques shall take place. Construction activities may occur once a qualified biologist has deemed the burrows are unoccupied. **Measure 4.5.1c (NT/F):** Prior to initiating construction activities at any proposed project site containing suitable habitat, a qualified biologist shall conduct a pre-construction survey for horned lark, Swainson's hawk, raptors, and other protected and migratory bird species. The survey shall be conducted to identify any active nests located within the construction area or up to 0.5 mile from the construction area. In addition, all trees slated for removal shall be surveyed by a qualified biologist no more than 48-hours before removal to ensure that no nesting birds are occupying the tree. If possible, trees slated for removal shall be removed starting September 1st through the end of February, outside of the nesting season. If active nests are found during the survey, the applicant shall implement appropriate mitigation measures to ensure that the species will not be adversely affected, which will include establishing a no-work buffer zone as, approved CDFW, around the active nest. The no-work buffer may vary depending on species and site specific conditions as approved by CDFW. Appropriate mitigation measures include delaying construction activities until a qualified biologist determines that juveniles have fledged the nest(s), or establishing a "no construction" zone buffer around the nest. The results of the survey shall be documented in a letter report that is distributed to the CDFW and the City of Fresno. These measures shall ensure compliance with the Migratory Bird Treaty Act and Fish and Game Code 3503.5.				
Impact 4.5.2: Implementation of the proposed project could result in potential disturbance or loss of valley elderberry longhorn beetle and its host plant, the elderberry shrub.	**Measure 4.5.2 (NT/F):** Prior to initiating construction activities at any project site, a qualified biologist shall conduct a pre-construction survey for the presence of the valley elderberry longhorn beetle and its elderberry host plant in accordance with USFWS protocols. If elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level occur on or adjacent to the project site, or are otherwise located where they may be directly or indirectly affected by the proposed project, minimization and compensation measures, which include transplanting	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	existing shrubs and planting replacement habitat (conservation plantings), are required (see below). Surveys are valid for a period of two years. No mitigation is required for the removal of elderberry stems measuring less than one inch in diameter, measured at ground level. For shrubs with stems measuring 1.0 inch or greater, the project proponent shall ensure that elderberry shrubs within 100 feet of proposed development be protected and/or compensated for in accordance with the *U.S. Fish and Wildlife Services' (USFWS) Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS, 1999a) and the *Programmatic Formal Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle Within the Jurisdiction of the Sacramento Field Office* (USFWS, 1996).				
Impact 4.5.3: Implementation of the proposed project could result in potential disturbance or loss of western pond turtle and its habitat.	**Measure 4.5.3 (NT/F):** No more than two weeks prior to the commencement of ground-disturbing activities a qualified biologist shall perform surveys for western pond turtle within suitable aquatic and upland habitat on the project site. Surveys shall include western pond turtle nests as well as individuals. The biologist (with the appropriate agency permits or approvals) shall temporarily move any identified western pond turtles upstream of the construction site, and temporary barriers shall be placed around the construction site to prevent ingress. Construction shall not proceed until the work area is determined to be free of turtles and their nests. The biologist will be responsible for moving adult turtles that enter the construction zone after construction has begun. If a nest is located within a work area, the biologist [with the appropriate permits or approvals from the California Department of Fish and Wildlife (CDFW)] may move the eggs to a suitable facility for incubation, and release hatchlings into the original habitat in late fall. The biologist shall be present on the project site during initial ground clearing and grading and during all other construction activities adjacent to drainages with the potential to support western pond turtle. The results of these surveys shall be documented in a technical memorandum that shall be submitted to the CDFW (if turtles are documented) and/or the City.	S	LS	S	LS
Impact 4.5.4: Implementation of the proposed project could result in potential disturbance or loss of San Joaquin kit fox and its habitat.	**Measure 4.5.4a (NT/F):** To ensure that impacts to the San Joaquin kit fox and its habitat are avoided or reduced, the following measures shall be implemented: Preconstruction surveys for the San Joaquin kit fox shall be conducted no less than two calendar weeks and no more than thirty calendar days prior to commencement of ground disturbance. Surveys shall be conducted by qualified biologists. When surveys identify potential dens (defined as burrows at least four	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	inches in diameter which open up within two feet), potential den entrances shall be dusted for three calendar days to register and track activity of any San Joaquin kit fox present. If no San Joaquin kit fox activity is identified, the den may be destroyed. If San Joaquin kit fox activity is identified, then dens shall be monitored for at least five consecutive days from the time of observation to determine if occupation is by an adult fox only or is a natal den (natal dens usually have multiple openings). If the den is occupied by an adult only, it may be destroyed when the adult fox has moved or is temporarily absent. If the den is a natal den, a buffer zone of 250 feet shall be maintained around the den and as approved by the USFWS. This buffer zone will be maintained until the biologist determines that the den has been vacated. Where San Joaquin kit fox are identified, the provisions of the USFWS's published *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS, 199b) shall apply (except that preconstruction survey protocols shall remain as established in this paragraph). These standards include provisions for educating construction workers regarding the kit fox, keeping heavy equipment operating at safe speeds, checking construction pipes for kit fox occupation during construction and similar low or no-cost activities. **Measure 4.5.4b (NT/F):** All excavated, steep-walled holes or trenches more than two feet deep shall be covered at the close of each working day by plywood or similar materials or provided with one or more escape ramps constructed of earth-full or wooden planks.				
Impact 4.5.5: Implementation of the proposed project could result in potential disturbance or loss of American badger and its habitat.	**Measure 4.5.5 (NT/F)**: To ensure that impacts to the American badger and their habitat are avoided or reduced, the following measures shall be implemented: • A qualified biologist shall conduct a training session for all construction personnel focused on the protection and conservation of protected, non-listed special-status wildlife species, including American badgers. At a minimum, the training shall include a species and habitat description for the American badger (in addition to other non-listed special-status species). The training session shall identify the general measures that are being implemented to minimize impacts on these species as they relate to the project, and the boundaries within which the project could be accomplished. • Concurrent with other required surveys, during winter/spring months before new project activities, and concurrent with other preconstruction surveys (e.g., kit fox and burrowing owl), a qualified biologist shall perform a pre-activity	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

Impacts	Mitigation Measures	Near-Term Project Elements		Future Project Elements	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
	survey to identify the presence of American badgers. If this species is not found, no further mitigation shall be required. If badgers are identified, they shall be passively relocated using burrow exclusion (e.g., installing one-way doors on burrows) or similar CDFW-approved exclusion methods. In unique situations it might be necessary to actively relocate badgers (e.g., using live traps) to protect individuals from potentially harmful situations. Such relocation could be performed with advance CDFW coordination and concurrence. When unoccupied dens are encountered outside of work areas but within 100 feet of proposed activities, vacated dens shall be inspected to ensure they are empty and temporarily covered using plywood sheets or similar materials. • If badger occupancy is determined at a given site within the work area, the construction manager should be informed that work should be halted. Depending on the den type, reasonable and prudent measures to avoid harming badgers will be implemented and may include seasonal limitations on project construction near the site (i.e., restricting the construction period to avoid spring-summer pupping season), and/or establishing a construction exclusion zone around the identified site, or resurveying the den a week later to determine species presence or absence. • To minimize the possibility of inadvertent badger mortality, project-related vehicles shall observe a maximum 20 miles per hour speed limit on private roads. • To prevent accidental entrapment of badgers or other animals during construction, all excavated holes or trenches greater than 2 feet deep shall be covered at the end of each work day by suitable materials, or escape routes constructed of earthen materials or wooden planks shall be provided. Before filling, such holes shall be thoroughly inspected for trapped animals. • All food-related trash items (such as wrappers, cans, bottles, and food scraps) shall be disposed of in closed containers and removed daily from the project area. • To prevent harassment and mortality of badgers or destruction of their dens, no pets shall be allowed in the project area.				
Impact 4.5.6: Proposed project activities could result in potential disturbance or loss of Western mastiff bat and hoary bat and their habitat.	**Measure 4.5.6 (NT/F):** To ensure that impacts to the special-status bat species and their habitat are avoided or reduced, the following measures shall be implemented:	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	• Before construction activities (i.e., ground clearing and grading, including trees removal) within 200 feet of trees that could support special-status bats, a qualified bat biologist shall survey for special-status bats. If no evidence of bats (i.e., direct observation, guano, staining, or strong odors) is observed, no further mitigation shall be required. • If evidence of bats is observed, the City of Fresno and its contractors shall implement the following measures to avoid potential impacts on breeding populations: • A no-disturbance buffer of 250-feet shall be created around active bat roosts during the breeding season (April 15 through August 15). Bat roosts initiated during construction are presumed to be unaffected by the indirect effects of noise and construction disturbances. However, the direct take of individuals will be prohibited. • Removal of trees showing evidence of active bat activity shall occur during the period least likely to affect bats, as determined by a qualified bat biologist (generally between February 15 and October 15 for winter hibernacula, and between August 15 and April 15 for maternity roosts). If the exclusion of bats from potential roost sites is necessary to prevent indirect impacts due to construction noise and human activity adjacent, bat exclusion activities (e.g., installation of netting to block roost entrances) shall also be conducted during these periods.				
Impact 4.5.7: Implementation of the proposed project could result in significant effects to rare or special-status plants and their habitat.	**Measure 4.5.7a (NT/F):** Prior to construction, vegetated portions of the project site, including wetland habitats, shall be surveyed by a qualified botanist for the California satintail, San Joaquin adobe sunburst, Sandford's arrowhead, and other special-status plant species with the potential to occur in the project area. The survey(s) shall be conducted in accordance with established CDFW Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities (CDFG, 2009), which calls for protocol-level surveys during the appropriate flowering/identification period for the species. **Measure 4.5.7b (NT/F):** The following measures shall be implemented to compensate for the loss of special-status or rare plants identified on the project site: • Avoid existing, known populations where possible; • Minimize impacts by restricting removal of plants to a few individuals of a	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

Impacts	Mitigation Measures	Near-Term Project Elements		Future Project Elements	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
	population where possible; • Prepare a Mitigation and Monitoring Plan to relocate plants and/or seed banks or reintroduce new populations in suitable habitat and soil types within the on-site Preserve or at a CDFW or USFWS-approved off-site location; • To the extent feasible/practical, restore project site locations that supported rare or special-status plants to its original condition.				
Impact 4.5.8: Implementation of the proposed project could result in the removal, filling, interruption or degradation of protected wetlands and other waters of the United States.	**Measure 4.5.8a (NT/F):** In order to protect and preserve wetland habitats within the proposed project area, the following measures shall be implemented: • Prior to construction, a jurisdictional wetland delineation shall be prepared for verification by the Corps to determine the location and extent of waters of the U.S. and wetlands on and near Project Elements. Following the verification, if jurisdictional wetlands will be impacted, a Section 404 permit application shall be prepared and submitted to the Corps. • The no net loss of wetland habitat and no significant impacts to potential jurisdictional features policy shall be complied with through compensation for the unavoidable loss of wetlands at a ratio no less than 1:1. Compensation shall take the form of wetland preservation or creation in accordance with Corps and CDFW mitigation requirements, as required under project permits. Preservation and creation may occur onsite through a conservation agreement or offsite through purchasing credits at a Corps approved mitigation bank. • In addition, the RWQCB regulates these features under Section 401 of the CWA; the City shall also apply for a Section 401 Water Quality Certification from the RWQCB prior to discharging fill in these features. Irrigation canals and potential wetlands within the proposed project area may be considered waters of the U.S. and fall under the jurisdictional purview of the Corps and/or RWQCB per Sections 401 and 404 of the CWA.	S	LS	S	LS
Impact 4.5.9: Proposed project activities could result in the removal of street trees protected by the City of Fresno or oak woodland habitat located within Fresno County.	**Measure 4.5.9a (NT/F):** Sensitive tree resources adjacent to construction activities may require additional protection. The following measures shall protect trees to be retained onsite during construction of the proposed project: • A Tree Protection Zone (TPZ) shall be established around any tree or group of trees to be retained. The formula typically used is defined as 1.5 times the radius of the dripline or 5 feet from the edge of any grading, whichever is greater. The TPZ may be adjusted on a case-by-case basis after consultation	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

Impacts	Mitigation Measures	Near-Term Project Elements		Future Project Elements	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
	with a certified arborist. • The TPZ of any protected trees shall be marked with permanent fencing (e.g., post and wire or equivalent), which shall remain in place for the duration of construction activities in the area. Post "keep out" signs on all sides of fencing. • Construction-related activities, including grading, trenching, construction, demolition, or other work shall be prohibited within the TPZ. No heavy equipment or machinery shall be operated within the TPZ. No construction materials, equipment, machinery, or other supplies shall be stored within a TPZ. No wires or signs shall be attached to any tree. Any modifications must be approved and monitored by a certified arborist. • Prune selected trees to provide necessary clearance during construction and to remove any defective limbs or other parts that may pose a failure risk. All pruning shall be completed by a certified arborist or tree worker and adhere to the *Tree Pruning Guidelines* of the International Society of Arboriculture. • The TPZs of protected trees shall be monitored on a weekly basis. • A certified arborist shall monitor the health and condition of the protected trees and, if necessary, recommend additional mitigations and appropriate actions. This shall include the monitoring of trees adjacent to project facilities in order to determine if construction activities (including the removal of nearby trees) would affect protected trees in the future. • Provide supplemental irrigation and other care, such as mulch and fertilizer, as deemed necessary by a certified arborist. Any injuries shall be treated by a certified arborist. **Measure 4.5.9b (NT/F):** the City shall comply with the Fresno Municipal Code (F.M.C. 11-305) if protected street trees are proposed for removal.				
Impact 4.5.10: Proposed project activities could potentially result in disturbance or loss of riparian habitat and/or lake or streambed alteration through direct and indirect impacts.	**Measure 4.5.10 (NT/F):** In order to protect and preserve riparian habitats and/or lake or streambeds within the proposed project area, the following measures shall be implemented: The City of Fresno shall obtain a Section 1602 Streambed Alteration Agreement prior to implementing any action that may alter a stream or lake within the jurisdictional limits of CDFW (typically the top of bank or edge of riparian habitat, whichever is greater).	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.5.11: Proposed project activities could potentially interfere with wildlife movement corridors through direct and indirect impacts.	**Measure 4.5.11 (NT):** Implement Mitigation Measures 4.5.8, 4.5.9, and 4.5.10.	S	LS	LS	NA
Impact 4.5.12: Implementation of the proposed project, when combined with development of other future projects, could contribute to the cumulative loss or degradation of habitat or species protected under federal, State and local regulations.	**Measure 4.5.12 (NT/F):** Implement Measures 4.5.1 through 4.5.11.	S	LS	S	LS
4.6 Transportation and Traffic					
Impact 4.6.1 Project construction activities would intermittently and temporarily increase traffic congestion due to vehicle trips generated by construction workers and construction vehicles on area roadways.	**Measure 4.6.1a (NT/F):** Prior to construction, the City of Fresno and its contractor(s) shall coordinate with the appropriate local government departments, and with utility districts and agencies regarding the timing of construction projects that would occur near project sites. Specific measures to mitigate potential significant impacts would be determined as part of the interagency coordination, and could include measures such as employing flaggers during key construction periods, designating alternate haul routes, and providing more outreach and community noticing. **Measure 4.6.1b (NT/F):** The following requirements shall be incorporated into contract specifications prepared by the City for the project: • The contractor(s) will obtain any necessary road encroachment permits prior to construction and will comply with conditions of approval attached to project implementation. As part of the road encroachment permit process, the contractor(s) will submit a traffic safety / traffic management plan (for work in the public right-of-way) to the agencies having jurisdiction over the affected roads. Elements of the plan will likely include, but are not necessarily limited to, the following: o Develop circulation and detour plans to minimize impacts to local street circulation. Use haul routes minimizing truck traffic on local roadways to the extent possible. Use flaggers and/or signage to guide vehicles through and/or around the construction zone. o Control and monitor construction vehicle movements through the enforcement of standard construction specifications by periodic onsite inspections.	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

Impacts	Mitigation Measures	Near-Term Project Elements		Future Project Elements	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
	o To the extent feasible, and as needed to avoid adverse impacts on traffic flow, schedule truck trips outside of peak morning and evening commute hours. o Limit lane closures during peak hours to the extent possible. Delays would also be experienced by drivers during off-peak hours, but because of the lower volume, fewer people would be affected by the delays during those periods. Restore roads and streets to normal operation by covering trenches with steel plates outside of allowed working hours or when work is not in progress. o Limit, where possible, the pipeline construction work zone to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone. Parking may be prohibited if necessary to facilitate construction activities or traffic movement. If the work zone width will not allow a 10-foot-wide paved travel lane, then the road will be closed to through-traffic (except emergency vehicles) and detour signing on alternative access streets will be used. o Include signage to direct pedestrians and bicyclists around project construction work zones that displace sidewalks and/or bike lanes. o Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite, in such a manner to minimize obstruction to traffic. o Comply with roadside safety protocols. Provide "Road Work Ahead" warning signs and speed control (including signs informing drivers of state-legislated double fines for speed infractions in a construction zone) to achieve required speed reductions for safe traffic flow through the work zone. o Coordinate with facility owners or administrators of sensitive land uses such as police and fire stations, transit stations, hospitals, and schools. Provide advance notification to the facility owner or operator of the timing, location, and duration of construction activities and the locations of detours and lane closures. o Coordinate construction activities, to extent possible, to minimize traffic disturbances adjacent to schools (e.g., do work during summer months when there is less activity at schools). For construction activities that occur during the school year, then at the start and end of the school day at schools adjacent to a pipeline project, the contractor(s) will provide flaggers in the				

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	school areas to ensure traffic and pedestrian safety. o Coordinate with the Fresno Area Express so the transit provider can temporarily relocate bus routes or bus stops in work zones as it deems necessary. o To the extent feasible, and as needed to avoid adverse impacts on traffic flow, schedule construction of project elements to avoid overlapping maximum trip-generation construction phases.				
Impact 4.6.2 Reduction in the number of, or the available width of, travel lanes on roads where pipeline construction would occur, would result in short-term traffic delays for vehicles traveling past the construction zones	**Measure 4.6.2 (NT/F):** Implement Mitigation Measure 4.6.1.	S	LS	S	LS
Impact 4.6.3 Project construction would potentially cause traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways	**Measure 4.6.3 (NT/F):** Implement Mitigation Measure 4.6.1.	S	LS	S	LS
Impact 4.6.4 Project construction activities would intermittently and temporarily impede access to local streets or adjacent uses (including access for emergency vehicles), as well as disruption to bicycle/pedestrian access and circulation.	**Measure 4.6.4 (NT/F):** Implement Mitigation Measure 4.6.1.	S	LS	S	LS
Impact 4.6.5: Under Existing Plus Project Conditions operation of the proposed SE SWTF would result in an increase in vehicle trips that could exceed levels of service standards for surrounding roadways.	**Measure 4.6.5 (NT):** Prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF the intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations: • Eastbound: one left-turn lane and a shared through/right-turn lane • Westbound: two left-turn lanes and a shared through/right-turn lane • Northbound: one left-turn lane and a shared through/right-turn lane	S	LS	NA	NA

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	• Southbound: one left-turn lane and a shared through/right-turn lane To receive the two left-hand turn lanes west bound, a second southbound lane would be required south of Olive Avenue to tie into the existing portion of Fowler that has already been built. With implementation of this mitigation the intersection would operate at LOS C and 95th percentile queues in the left-turn and right-turn lanes will be 219 feet or less. The maximum calculated 95th-percentile queue in the westbound left-turn lanes is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound dual left-turn lanes, which should provide a storage length of at least 319 feet.				
Impact 4.6.6 Under Cumulative (2035) Plus Project Conditions without the McKinley Road realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways.	**Measure 4.6.6a (NT):** The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards improvements at the Fowler and Floradora Avenues intersection. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The widening shall be designed in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations: • Eastbound: one shared left-turn/right turn land • Westbound: does not exist • Northbound: two through lanes with a shared right turn • Southbound: one left-turn lane and two through lanes All-way stop control would not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. With implementation of the improvements identified in this mitigation measure the intersection would continue to operate at LOS F during the a.m. and p.m. peak hours. **Measure 4.6.6b (NT):** The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards improvements at the Armstrong and Floradora Avenues intersection. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The widening shall be designed in accordance with City of Fresno standards with two-way stop-control and the following minimum lane	S	SU	NA	NA

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

Impacts	Mitigation Measures	Near-Term Project Elements		Future Project Elements	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
	configurations: • Eastbound: one shared left-turn/through/right-turn lane • Westbound: one shared left-turn/through/right-turn lane • Northbound: one left-turn lane and two through lanes with a shared right turn • Southbound: one left-turn lane and two through lanes with a shared right turn All-way stop control would not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. With implementation of the improvements identified in this mitigation measure the eastbound and westbound approaches to the intersection would continue to operate at LOS F during a.m. and p.m. peak hours. **Measure 4.6.6c (NT):** Implement Mitigation Measure 4.6.5. **Measure 4.6.6d (NT):** The City of Fresno shall pay its fair share contribution of applicable TSMI and FMSI fees towards the signalization of the Armstrong and Olive Avenues intersection. The signal shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The signal would be installed in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations: • Eastbound: one left-turn lane and two through lanes with a shared right turn • Westbound: one left-turn lane and two through lanes with a shared right turn • Northbound: one left-turn lane, two through lanes, and one right-turn lane • Southbound: one left-turn lane, two through lanes, and one right-turn lane With implementation of this mitigation the intersection would operate at LOS C during a.m. and p.m. peak hours. With the exception of the eastbound left-turn lane, 95th-percentile queues in the left-turn lanes will be 201 feet or less and 95th-percentile queues in right-turn lanes will be 92 feet or less. The maximum calculated 95th-percentile queue in the eastbound left-turn lane is 308 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound left-turn lane, which should provide a storage length				

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	of at least 308 feet. **Measure 4.6.6e (NT):** The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards the widening of Fowler Avenue between Olive and Floradora Avenues to four lanes in accordance with City of Fresno standards. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. With implementation of this mitigation measure the road segment would operate at LOS D during both a.m. and p.m. peak hours. This configuration would conform to the City of Fresno General Plan and City of Fresno standards for a four-lane arterial. **Measure 4.6.6f (NT):** The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards the widening of Armstrong Avenue between Olive and Floradora Avenues to four lanes in accordance with City of Fresno standards. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. With implementation of this mitigation measure the road segment would operate at LOS C during both a.m. and p.m. peak hours. This configuration would conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. **Measure 4.6.6g (NT):** The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards the widening of Olive Avenue between Fowler and Armstrong Avenues to four lanes in accordance with City of Fresno standards. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. With implementation of this mitigation measure the road segment would operate at LOS C during both a.m. and p.m. peak hours. This configuration would conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector.				

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.6.7 Under Cumulative (2035) Plus Project Conditions with the McKinley Avenue realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways.	**Measure 4.6.7a (NT):** The City of Fresno shall pay its fair share contribution of applicable TSMI and FMSI fees towards improvements at the Fowler and Floradora (McKinley) Avenues intersection. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The intersection shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations: • Eastbound: one left-turn land, one through lane, and one right-turn lane • Westbound: two left-turn lanes, one through lane, and one right-turn lane • Northbound: two left-turn lane and two through lanes, and one right-turn lane • Southbound: one left-turn lane, two through lanes, and one right-turn lane With implementation of this mitigation measure the intersection would operate at LOS C during both a.m. and p.m. peak hours. The 95th-percentile queues in the left-turn and right-turn lanes would be 164 feet or less. Therefore, standard City of Fresno turn lanes are recommended. **Measure 4.6.7b (NT):** The City of Fresno shall pay its fair share contribution of applicable TSMI and FMSI fees towards improvements at the Armstrong and Floradora (McKinley) Avenues intersection. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The widening shall be designed in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations: • Eastbound: one left-turn, one through lane, and one right-turn lane • Westbound: one left-turn, one through lane, and one right-turn lane • Northbound: one left-turn lane and two through lanes with a shared right turn • Southbound: one left-turn lane and two through lanes with a shared right turn With implementation of this mitigation measure the intersection would operate at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour. The 95th-percentile queues in the left-turn and right-turn lanes would be 203 feet or less.	S	SU	NA	NA

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

Impacts	Mitigation Measures	Near-Term Project Elements		Future Project Elements	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
	Measure 4.6.7c (NT): Implement Mitigation Measure 4.6.5. **Measure 4.6.7d (NT):** Implement Mitigation Measure 4.6.6d. With implementation of this mitigation measure the intersection would operate at LOS C during both a.m. and p.m. peak hours. With the exception of the eastbound left-turn lane, 95th-percentile queues in the left-turn lanes would be 187 feet or less and 95th-percentile queues in right-turn lanes would be 89 feet or less. The maximum calculated 95th-percentile queue in the eastbound left-turn lane is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the eastbound left-turn lane, which should provide a storage length of at least 319 feet. **Measure 4.6.7e (NT):** Implement Mitigation Measure 4.6.6e. **Measure 4.6.7f (NT):** Implement Mitigation Measure 4.6.6f. **Measure 4.6.7g (NT):** Implement Mitigation Measure 4.6.6g.				
Impact 4.6.8 Construction of the proposed project, in combination with construction projects could temporarily increase traffic congestion, result in short-term traffic delays, and create traffic hazards.	**Measure 4.6.8 (NT/F):** Implement Mitigation Measure 4.6.1.	S	LS	S	LS
4.7 Air Quality and Climate Change					
Impact 4.7.1: Construction activities associated with development of the project would generate short-term emissions of criteria pollutants.	**Measure 4.7.1a (NT/F):** The City of Fresno shall comply with Regulation VIII Rule 8011 and implement the following dust control measures during all future project construction: • The City of Fresno's general construction contractor shall submit a Dust Control Plan subject to review and approval of the SJVAPCD at least 30 days prior to the start of any construction activity on a site that includes 40 acres or more of disturbed surface area. Specific control measures for construction, excavation, extraction, and other earthmoving activities required by the SJVAPCD include: • All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or	S	SU	S	SU

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

Impacts	Mitigation Measures	Near-Term Project Elements		Future Project Elements	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
	other suitable cover or vegetative ground cover in order to comply with Regulation VIII's 20 percent opacity limitation. • All onsite unpaved roads and offsite unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant. • All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water (at least two times per day) or by presoaking. • When materials are transported offsite, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained. • All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. However, the use of blower devices is expressly forbidden, and the use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. • Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant. • Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday. • Any site with 150 or more vehicle trips per day shall prevent carryout and trackout. Enhanced and additional control measures for construction emissions of PM_{10} shall be implemented where feasible. These measures include: • Limit traffic speeds on unpaved roads to 15 mph. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent. • Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site.				

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

Impacts	Mitigation Measures	Near-Term Project Elements		Future Project Elements	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
	• Install wind breaks at windward side(s) of construction areas. • Suspend excavation and grading activity when winds exceed 20 mph. • Limit area subject to excavation, grading, and other construction activity at any one time. **Measure 4.7.1b (NT/F):** Implementation Plans prepared by the City of Fresno for this project shall comply with Rule 9510 Indirect Source Review. Compliance with Rule 9510 would require reductions of 20 percent of the NO_x construction emissions and 45 percent of the PM_{10} construction exhaust emissions. If these emission reductions are not met, then the City of Fresno shall pay the required mitigation fees by the SJVAPCD. **Measure 4.7.1c (NT/F):** Off-road construction equipment used on site shall achieve fleet average emissions equal to or less than the Tier II emissions standard of 4.8 NO_x g/hp-hr.				
Impact 4.7.2: Operation of the project could generate criteria air pollutant emissions that could contribute to existing nonattainment conditions and degrade air quality.	None required.	LS	NA	LS	NA
Impact 4.7.3: Construction and/or operation of the project could expose sensitive receptors to substantial pollutant concentrations.	None required.	LS	NA	LS	NA
Impact 4.7.4: The project could create objectionable odors affecting a substantial number of people.	None required.	LS	NA	LS	NA
Impact 4.7.5: Construction and operation of the project could result in a cumulatively considerable increase in greenhouse gas emissions.	None required.	LS	NA	LS	NA
Impact 4.7.6: Construction of proposed project facilities, when combined other development projects in the San Joaquin Valley air basin, would result in cumulative air quality impacts.	**Measure 4.7.6 (NT/F):** Implement Mitigation Measure 4.7.1.	S	SU	S	SU

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.7.7: Operation of proposed project facilities, when combined other development projects in the San Joaquin Valley air basin, would result in cumulative air quality impacts.	None required.	LS	NA	LS	NA
4.8 Noise					
Impact 4.8-1 Project construction could temporarily increase noise levels at nearby sensitive receptor locations.	**Measure 4.8.1 (NT/F):** The City and its contractors shall implement the following mitigation measures when project-related construction in the City is planned to occur within 1,500 feet of sensitive receptors: • Sensitive receptors (residences, residential areas, schools, and hospitals) within 1,500 of project construction activities shall be identified and mapped, and this information shall be used to minimize noise impacts to sensitive receptors. • Construction activities shall meet municipal code requirements related to noise. Construction activities shall be limited to between 7 a.m. and 6 p.m. Monday through Saturday to avoid noise-sensitive hours of the day. Construction activities shall be prohibited on Sundays and holidays. • Construction equipment noise shall be minimized by muffling and shielding intakes and exhaust on construction equipment (per the manufacturer's specifications) and by shrouding or shielding impact tools. • Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. External jackets on the tools themselves shall be used where feasible. Quieter procedures, such as use of drills rather than impact tools, shall be used whenever feasible. • Construction contractors shall locate fixed construction equipment (such as compressors and generators) and construction staging areas as far as possible from nearby sensitive receptors including residences, schools, and hospitals. • If construction were to occur near a school, the construction contractor shall coordinate with the most noise producing construction activities with school administration in order to limit disturbance to the campus. • Signs shall be posted at constructions sites that include permitted construction	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	days and hours, a day and evening contact number for the job site, and a contact number in the event of problems. • An onsite complaint and enforcement manager shall respond to and track complaints and questions related to noise.				
Impact 4.8-2 Project construction could expose persons and structures to ground-borne vibration or ground-borne noise levels.	**Measure 4.8.2 (NT/F):** The City and its contractors shall implement the following measures when project-related construction is planned to occur within the City limits and/or within 1,500 feet of sensitive receptors: • Sensitive receptors (residences, residential areas, schools, and hospitals) within 1,500 of project construction activities shall be identified and mapped, and this information shall be used to minimize ground-borne vibration and ground-borne noise impacts to sensitive receptors. • Limit jack and bore drilling to 45 feet from sensitive receptors and 15 feet from any structures. • If jack and bore drilling must occur within 15 feet of any structure, the construction contractor shall conduct crack surveys before drilling to prevent potential architectural damage to nearby structures. The surveys shall be done by photographs, video tape, or visual inventory, and shall include inside as well as outside locations. All existing cracks in walls, floors, and driveways shall be documented with sufficient detail for comparison after construction to determine whether actual vibration damage occurred. A post-construction survey shall be conducted to document the condition of the surrounding buildings after the construction is complete.	S	LS	S	LS
Impact 4.8-3 Activities associated with operation of proposed project facilities could increase ambient noise levels at nearby land uses.	None required.	LS	NA	LS	NA
Impact 4.8-4 Operation of project facilities in the vicinity of an airport could expose employees to excessive noise levels.	None required.	LS	NA	NA	NA
Impact 4.8-5 Construction of the proposed project, when combined with construction of other future projects, could increase noise levels at nearby sensitive receptor locations.	**Measure 4.8.5 (NT/F):** Implement Mitigation Measures 4.8.1 and 4.8.2.	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

Impacts	Mitigation Measures	Near-Term Project Elements		Future Project Elements	
		Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Impact 4.8-6 Operation of proposed project facilities, when combined with operation of other future projects, could increase noise levels at nearby sensitive receptor locations.	None required.	LS	NA	LS	NA
4.9 Hazards and Hazardous Materials					
Impact 4.9.1: Construction of proposed project facilities could result in the potential exposure of construction workers, the public and the environment to existing soil and/or groundwater contamination.	**Measure 4.9.1a (NT/F):** Prior to final project design and any earth disturbing activities, the City shall conduct a Phase I Site Assessment. The Phase I Site Assessment shall be prepared by a Registered Environmental Assessor (REA) or equally qualified professional to assess the potential for contaminated soil or groundwater conditions at the project site and along conveyance alignments. The Phase I Site Assessment shall include a review of appropriate federal and State hazardous materials databases, as well as relevant local hazardous material site databases for hazardous waste on-site and off-site locations within a one quarter mile radius of the project site and along conveyance alignments. The Phase I Site Assessment shall also include a review of existing or past land uses and aerial photographs, summary of results of reconnaissance site visit(s), and review of other relevant existing information that could identify the potential existence of contaminated soil or groundwater. If no contaminated soil or groundwater is identified or if the Phase I Site Assessment does not recommend any further investigation then the City shall proceed with final project design and construction. **Measure 4.9.1b (NT/F):** If existing soil or groundwater contamination is identified and if the Phase 1 Site Assessment recommends further review, the City shall retain a REA to conduct follow-up sampling to characterize the contamination and to identify any required remediation that shall be conducted consistent with applicable regulations prior to any earth disturbing activities. The environmental professional shall prepare a report that includes, but is not limited to, activities performed for the assessment, summary of anticipated contaminants and contaminant concentrations at the proposed construction site, and recommendations for appropriate handling of any contaminated materials during construction. **Measure 4.9.1c (NT/F):** If unidentified or suspected contaminated soil or groundwater is encountered during construction activities, work shall be halted in the area of potential exposure, and the type and extent of contamination shall be identified by a REA. The environmental professional shall prepare a report that includes, but is not limited to, activities performed for the assessment, summary of anticipated contaminants and contaminant concentrations at the proposed construction site, and recommendations for appropriate handling of any contaminated materials during construction.	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	Measure 4.9.1d (F): Groundwater wells and recharge basins shall be located at least 1,000 feet from any area that is listed and verified as a hazardous materials site on LUST, SLIC, Cortese, or other relevant databases.				
Impact 4.9.2: Construction and operation of proposed project facilities would involve the use, storage and transportation of hazardous materials which if released could result in a potential risk to the public and the environment.	None required.	LS	NA	LS	NA
Impact 4.9.3: Proposed project facilities could be located within one-quarter mile of a school resulting in potential hazards associated with accidental release of hazardous materials	None required.	LS	NA	LS	NA
Impact 4.9.4: Proposed project facilities could be located within two miles of an airport resulting in a safety hazard.	**Measure 4.9.4a (NT/F). P**roposed facilities located within two miles of a public use airport shall incorporate height and lighting restrictions identified in the applicable ALUCP. Construction equipment used to build structures and the structures themselves shall be limited in height in accordance with the Code of Federal Regulations. **Measure 4.9.4b (NT/F).** Surface water features (settling basins, groundwater recharge facilities, etc.) associated with proposed project facilities shall be sited consistent with the guidance contained in the Federal Aviation Administration Advisory Circular 150/520-33b Hazardous Wildlife Attractants on or Near Airports, as applicable.	S	LS	S	LS
Impact 4.9.5: Installation of transmission pipelines in public rights-of-way could impair or physically interfere with an adopted emergency response plan or emergency evacuation plan.	**Measure 4.9.5 (NT/F):** Implement Mitigation Measure 4.6.1.	S	LS	S	LS
Impact 4.9.6: Construction and operation of the proposed project could increase the risk of fire hazards.	None required.	LS	NA	LS	NA

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.9.7: Implementation of the proposed project could contribute to cumulative impacts associated with release of hazardous materials or other hazards.	None required.	LS	NA	LS	NA
4.10 Public Services and Utilities					
Impact 4.10.1: The proposed project could increase demands for public services.	None required.	LS	NA	LS	NA
Impact 4.10.2: The proposed project could generate solid waste that would be disposed of at a landfill without sufficient permitted capacity or violate statutes and regulations related to solid waste.	None required.	LS	NA	LS	NA
Impact 4.10.3: Implementation of the proposed project would increase demand for water supply and treatment.	None required.	LS	NA	LS	NA
Impact 4.10.4: Implementation of the proposed project would increase demand for wastewater treatment.	None required.	LS	NA	LS	NA
Impact 4.10.5: Implementation of the proposed project could increase energy demand.	None required.	LS	NA	LS	NA
Impact 4.10.6: Construction of the proposed project could result in temporary interference or disruption of utility service.	**Measure 4.10.6 (NT/F):** Prior to construction of individual projects, the City shall prepare and implement a Utility Avoidance Plan. The plan would ensure that individual project specifications contain a detailed engineering and construction plan to avoid utility conflicts. Measures to avoid utility conflicts include but might not be limited to: • Verification of utility locations through field survey and use of the Underground Service Alert (USA). • Specifications prepared as part of the design plans that include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utilities shall be notified of construction plans and schedule. Arrangements may be made with these entities regarding protection, relocation, or temporary disconnection of services. • Notification of residents and businesses in the proposed project construction	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	area of any planned utility service disruption two to four days in advance, in conformance with City, County and state standards. • Reconnection of any disconnected cables and lines as soon as possible.				
Impact 4.10.7: Implementation of the proposed project, in combination with other projects, could cumulative increase demands public services and utilities.	None required.	LS	NA	LS	NA
Impact 4.10.8: Construction of the proposed project, in combination with other projects, could result in temporary interference or disruption of utility service.	**Measure 4.10.8 (NT/F):** Implement Mitigation Measure 4.10.6.	S	LS	S	LS
4.11 Aesthetic Resources					
Impact 4.11.1: Implementation of the proposed project could adversely impact scenic vistas or scenic resources within a state scenic highway.	None required.	LS	NA	LS	NA
Impact 4.11.2: Implementation of the proposed project could degrade the existing visual character or quality of the project area.	**Measure 4.11.2a (NT/F):** During facility design, the design consultant shall prepare a landscape plan for each aboveground project facility. The landscape plan shall include measures to restore disturbed areas by reestablishing existing topography, including replanting trees and/or reseeding with a native seed mix typical of the immediately surrounding area. The landscape plan shall include a required seed mix and plant palate. Vegetation screening shall be included in the landscape plan in order to shield proposed aboveground facilities from public view. The landscape plan shall include a monitoring plan to ensure that the site restoration and the establishment of vegetation is successful. **Measure 4.11.2b (NT/F):** Surface water treatment facility design shall include non-glare exterior coatings that are colored an earth tone to blend in with the surrounding landscape.	S	LS	S	LS
Impact 4.11.3: Operation of project related facilities would introduce new sources of light and increase ambient light in the project area.	**Measure 4.11.3 (NT/F):** Nighttime security lighting shall be equipped with directional shields that aim light downward and away from adjacent properties and public roadways. In addition, lighting fixtures shall be placed to concentrate light onsite to avoid spillover onto adjacent properties and public roadways.	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.11.4: Implementation of the proposed project could make a cumulatively considerable contribution to adverse effects on the visual/aesthetic resources of local viewsheds in the project area.	**Measure 4.11.4 (NT/F):** Implement Mitigation Measures 4.11.2 and 4.11.3.	S	LS	S	LS
4.12 Cultural Resources					
Impact 4.12.1: Implementation of the proposed project could adversely impact historic architectural resources directly through demolition or substantial alteration, or indirectly through changes to historical setting.	**Measure 4.12.1a (NT):** Prior to construction of Conveyance Option 1, cultural resource surveys covering the remaining portions of the year-round maintenance access road along the Mill Ditch/Fresno Canal shall be completed and the findings documented. Mill Ditch/Fresno Canal shall be evaluated for its eligibility for listing in the National, California, and Fresno Registers. The evaluation shall be carried out by a qualified archaeologist and historian or architectural historian meeting the Secretary of the Interior's Standards. In the event that the canal is determined eligible for listing in the federal, state, or local registers, mitigation shall be recommended to minimize impacts to the canal. If avoidance of impacts is deemed infeasible, the City shall implement Mitigation Measure 4.12.1c. **Measure 4.12.1b (NT/F):** All areas slated for development or other ground-disturbing activities in the project area that contain structures 45 years old or older shall be surveyed and evaluated for their potential historic significance on a project-specific basis prior to approval of project plans. The survey shall be carried out by a qualified historian or architectural historian meeting the Secretary of the Interior's Standards for Architectural History. Demolition or substantial alteration of all previously recorded historic resources, including significant historic resources are encountered during the survey and evaluation efforts, shall be avoided. Any alterations, including relocation, to historic buildings or structures shall conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (NPS, 1995). If avoidance of identified historic resources is deemed infeasible, the City shall implement Mitigation Measure 4.12.1c. **Measure 4.12.1c (NT/F)**: If avoidance or relocation of an historic resource is determined infeasible, a qualified architectural historian shall be retained to document the affected historic resource in accordance with the National Park Service's Historic American Buildings Survey (HABS) and/or Historic American Engineering Record (HAER) standards. Such standards typically include large format photography using (4x5) negatives, written data, and copies of original plans if available. The HABS/HAER documentation packages shall be archived at local libraries and historical repositories the Southern San Joaquin Valley Information Center of the California Historical Resources Information System, and in the City	S	SU	S	SU

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	of Fresno's Historic Preservation archives. Public interpretation of historic resources at their original site shall also occur in the form of a plaque, kiosk or other method of describing the building's historic or architectural importance to the general public.				
Impact 4.12.2: Implementation of the proposed project could result in damage or destruction of known or previously unidentified archeological resources.	**Measure 4.12.2a (NT/F):** All areas slated for development or other ground-disturbing activities shall be subject to a Phase I survey (including records search and archaeological survey) for archaeological resources on a project-specific basis prior to approval of proposed project plans. The survey shall be carried out by a qualified archaeologist in consultation with local Native American groups. If potentially significant archaeological resources are encountered during the survey, the City shall require that the resources are evaluated for their eligibility for listing on the National Register or the California Register, and that recommendations are made for treatment of these resources if found to be significant, in consultation with the appropriate Native American groups. All previously recorded prehistoric and historic-period archaeological resources, as well as any significant resources identified as a result of the survey, shall be avoided. Ground-disturbing activity in areas determined to be sensitive for cultural resources shall be monitored by a qualified archaeologist and Native American representative. **Measure 4.12.2b (NT/F):** Prior to construction a worker training program shall be implemented to inform all personnel involved with earthmoving activities the potential for prehistoric and historic-period subsurface archaeological resources to be uncovered and/or disturbed by proposed project-related earth moving; where such remains are most likely to be encountered during earth moving; and procedures to be employed if archaeological resources are discovered during excavations. **Measure 4.12.2c (NT/F):** During construction, should prehistoric or historic-period subsurface cultural resources be discovered, all activity in the vicinity of the find shall stop and a Secretary of the Interior qualified archaeologist will be contacted to assess the significance of the find according to *CEQA Guidelines* section 15064.5. If any find is determined to be significant, the proposed project proponent and the archaeologist will determine, in consultation with local Native American groups, appropriate avoidance measures or other appropriate mitigation. All significant cultural materials recovered may be, as necessary and at the discretion of the consulting archaeologist and in consultation with local Native American groups, subject to scientific analysis, professional museum duration, and documentation according to current professional standards.	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.12.3: Ground-disturbing activities associated with construction of the proposed project could result in damage to previously unidentified human remains.	**Measure 4.12.3a (NT/F):** If human skeletal remains are uncovered during proposed project construction, work in the vicinity of the find shall cease and the Fresno County coroner will be contacted to evaluate the remains, following the procedures and protocols set forth in section 15064.5 (e)(1) of the *CEQA Guidelines*. If the County coroner determines that the remains are Native American, the proposed project proponent will contact the Native American Heritage Commission, in accordance with Health and Safety Code Section 7050.5, subdivision (c), and Public Resources Code 5097.98 (as amended by AB 2641) and the Most Likely Descendant will be identified. The Most Likely Descendant will make recommendations for the treatment of any human remains.	S	LS	S	LS
Impact 4.12.4: Ground-disturbing construction associated with implementation of the proposed project could result in disturbance or destruction of a paleontological resource.	**Measure 4.12.4a (NT/F):** If paleontological resources, such as fossilized bone, teeth, shell, tracks, trails, casts, molds, or impressions are discovered during ground-disturbing activities, all ground disturbing activities within 50 feet of the find shall be halted until a qualified paleontologist can assess the significance of the find and, if necessary, develop appropriate salvage measures in consultation with the City of Fresno and in conformance with Society of Vertebrate Paleontology Guidelines (SVP, 1995; SVP, 1996). **Measure 4.12.4b (NT/F):** Prior to all Master Plan facilities involving excavations greater than 6 feet in depth (including pipeline crossings and groundwater recharge basins), the City of Fresno shall retain a qualified paleontologist to design a monitoring and mitigation program. The paleontological resource monitoring and mitigation program should include: • A worker training program to inform all personnel involved with earthmoving activities the potential for fossil remains being uncovered and/or disturbed by proposed project-related earth moving; where such remains are most likely to be encountered during earth moving; and procedures to be employed if fossil remains are discovered during excavations. • Preconstruction coordination with appropriate agencies, and identification of an institution willing and able to accept fossil specimens collected during the mitigation program. The institution shall serve as an information repository over the course of the proposed project. • A schedule and plan for monitoring earth-moving activities, and a provision that monitoring personnel have the authority to halt construction activities should a potential fossil-find be unearthed. • Emergency discovery procedures, including survey and record keeping of fossil-finds, bulk sediment sample collection and processing, specimen identification, disposition, or museum curation of any specimens and data	S	LS	S	LS

TABLE ES-3
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF FRESNO METRO PLAN UPDATE

		Near-Term Project Elements		Future Project Elements	
Impacts	**Mitigation Measures**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
	recovered. • Monitoring and data recovery activities shall be documented in daily monitoring reports, as well as a final mitigation monitoring report at the completion of construction activities, which shall be submitted to the City of Fresno. Implementation of the mitigation program and data recovery shall occur in accordance with SVP standards (SVP, 1995; SVP, 1996).				
Impact 4.12.5: Implementation of the proposed project, combined with other projects could result in the loss or destruction of historical architectural resources.	**Measure 4.12.5 (NT/F):** Implement Mitigation Measure 4.12.1.	S	SU	S	SU
Impact 4.12.6: Implementation of the proposed project, combined with other projects could result in the loss of destruction of archaeological and/or paleontological resources.	**Measure 4.12.6 (NT/F):** Implement Mitigation Measures 4.12.2, 4.12.3, and 4.12.4.	S	LS	S	LS

SU = Significant and Unavoidable Impact
LS = Less than Significant Impact
NI = No Impact

CHAPTER 1
Introduction

The City of Fresno (City) proposes to adopt and implement the Fresno Metropolitan Water Resources Management Plan Update (Metro Plan Update or proposed project). The purpose of the Metro Plan Update is to update and refine the 1996 Fresno Metropolitan Water Resources Management Plan (1996 Metro Plan) taking into consideration available new data and accommodating physical and institutional changes which have occurred since the 1996 Metro Plan was prepared. The completed Metro Plan Update would facilitate future water resource decisions and utility planning, and could assist in the pursuit of potential funding opportunities. Implementation of the City's recommended water supply plan would result in a more optimized and efficient conjunctive use of the City's available water resources, which will enhance the City's overall water supply reliability. Chapter 2 provides background on the City's existing water supply. The proposed Metro Plan Update includes near-term and future project elements including surface water treatment facilities, regional transmission facilities, groundwater facilities, potable water storage facilities, recycled water facilities, and water conservation measures. A detailed description of near-term and future project elements is described Chapter 3, Project Description.

The overall objective of the City's Metro Plan Update is to provide sustainable and reliable water supplies to meet the demands of existing and future customers through buildout of the adopted general plan in effect at the time of approval of the Environmental Impact Report (EIR). The City is in process of updating the General Plan (2035 General Plan Update). The project area for the proposed Metro Plan Update includes the existing city limits and the City of Fresno Sphere of Influence (SOI) designated by the adopted 2025 General Plan. The boundaries designated by the proposed 2035 General Plan Update are consistent with those adopted in the 2025 General Plan; therefore, the proposed project area would not change. Because the City is in the process of updating its general plan, the EIR will analyze the project with regard to the adopted general plan in effect at the time of consideration of certification of the EIR.

As described in the California Environmental Quality Act (CEQA) *Guidelines* (section15121 [a]); an EIR is a document to inform the lead agency and the public of the significant environmental effects of a project, identify possible measures to mitigate identified significant impacts, and describe reasonable alternatives to a project. The City of Fresno, acting as lead agency, has prepared this EIR pursuant to CEQA to analyze the potential environmental impacts of the construction and operation of the proposed Metro Plan Update.

1.1 Type of EIR

This EIR is both a project and program EIR. As a project EIR it evaluates the environmental impacts of proposed near-term project elements consistent with *CEQA Guidelines* section 5161. Future project elements are evaluated at a program level. As described in *CEQA Guidelines* section15168, a program EIR can be prepared on a series of actions that can be characterized as one large project and are related either:

- Geographically;
- As logical parts in the chain of contemplated actions;
- In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or
- As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

Consistent with CEQA guidelines on preparation and use of a program EIR, this EIR assesses and documents the broad environmental impacts of the proposed Metro Plan Update. Implementation of specific future project elements will be examined in the light of this EIR to determine whether additional subsequent environmental review is required (*CEQA Guidelines* section 15168). Subsequent environmental review documents may be "tiered" from this EIR, pursuant to *CEQA Guidelines* sections15152 and 15168. "Tiering" refers to the use of analysis from a broader EIR with subsequent environmental review concentrating on environmental issues specific to the future project elements that were not fully evaluated in this EIR.

1.2 Intended Uses of this EIR

CEQA requires that state and local government agencies consider the environmental consequences of projects over which they have discretionary authority. The City, as the lead agency for CEQA compliance, will use this EIR to evaluate the proposed project's potential environmental impacts, and can further use it to modify, approve, or deny approval of the proposed project based on the analysis provided in this EIR. The City has prepared this EIR to provide the public and responsible and trustee agencies with information about the potential environmental effects of the proposed project, and recommended mitigation measures and alternatives to the proposed project that would reduce or avoid adverse environmental impacts.

This EIR can also be used as CEQA compliance for subsequent activities implementing the proposed project by the City of Fresno (as the lead agency), and by responsible agencies that might need to issue approvals or permits for the proposed project. Subsection 3.6 in Chapter 3 lists the responsible agencies and the potential regulatory permits which could be for the proposed project.

1.3 Environmental Review and Approval Process

The preparation of an EIR involves multiple steps wherein the public is provided the opportunity to review and comment on the content of the EIR, the scope of the analyses, results and conclusions presented, and the overall adequacy of the document to meet the substantive requirements of CEQA

provide full disclosure of the potential environmental consequences of implementing the proposed project. The following discussion describes the major steps in the environmental review process.

1.3.1 Notice of Preparation

CEQA recommends conducting early coordination with the general public, appropriate public agencies, and local jurisdictions to assist in developing the scope of the environmental document. In accordance with sections 15063 and 15082 of the *CEQA Guidelines*, the City prepared a Notice of Preparation (NOP) to identify potential significant impacts that would be evaluated in this Program EIR (see Appendix A). The NOP was distributed to local, state, and federal agencies, and to other interested parties for a 30-day review period extending from September 6 through October 14, 2013. During the NOP review period, pursuant to *CEQA Guidelines* section15083, two public scoping meetings were held on September 16, 2013 at the City of Fresno Department of Public Utilities Water Division Corporation Yard located at 1910 East University Avenue. Public notices were placed in local newspapers informing the general public of the scoping meeting and the availability of the NOP. The purpose of the meeting was to present to the public the proposed project and its potential environmental impacts. Attendees were provided an opportunity to express comments on the scope of the EIR. Comments received during the NOP comment period are included in Appendix B and are summarized in the technical sections of Chapter 4, as applicable.

1.3.2 Draft EIR

The Draft EIR was made available to local, state, and federal agencies and to interested organizations and individuals who may want to review and comment on the adequacy of the analysis included in the EIR. Notice of this Draft EIR was also sent to every agency, person, or organization that commented on the NOP. The publication of the Draft EIR marks the beginning of a 45-day public review period. The 45-day public review period for the proposed project will be from February 14, 2014 through April1, 2014 ending at 5 PM. During the public comment period, written comments should be mailed or hand delivered to:

Brock D. Buche, PE, PLS, Project Manager
City of Fresno Department of Public Utilities, Water Division
1910 East University Avenue
Fresno, CA 93703-2988
FresnoMetroPlan@esassoc.com

A copy of this Draft EIR and the Draft Fresno Metropolitan Water Resources Management Plan Update are available at the following locations:

- City website - www.fresno.gov/water (go to “Important Documents”)
- City of Fresno Department of Public Utilities Water Division, 1910 East University Avenue, Fresno, CA 93703-2988
- City of Fresno City Hall, 2600 Fresno Street, 4th Floor, Room 4019, Department of Public Utilities Administration, Fresno, CA 93721
- County of Fresno Central Library, 2420 Mariposa Street, Fresno, CA 93721

1.3.3 Final EIR and Project Approval

Written and oral comments received in response to the Draft EIR will be addressed in a Final EIR, which together with the Draft EIR will constitute the EIR for the proposed project. The EIR will be made available to commenting agencies at least 10 days before the City Council considers action to certify the EIR.

Prior to considering the project for approval, the Fresno City Council will review and consider the information presented in the EIR and will certify that the EIR has been adequately prepared in accordance with CEQA. Prior to approving the project, the City shall make Findings regarding any significant, unavoidable environmental effects identified in the Final Program EIR, and if necessary, adopt Statements of Overriding Considerations regarding these impacts (*CEQA Guidelines* sections15091 and 15093). Once the EIR is certified, the City may proceed to consider project approval (*CEQA Guidelines* sections15090 and 15096(f)).

Following certification of the EIR and project approval the City will file a Notice of Determination (NOD) with the County of Fresno Clerk and the State Clearinghouse. The Responsible Agencies will then adopt the certified EIR and file separate NODs prior to implementing their segments of the proposed project. Each Responsible Agency also shall make Findings and adopt Statements of Overriding Considerations for any significant, unavoidable environmental effects identified in the Final EIR (*CEQA Guidelines* section 15096(h)).

1.3.4 Mitigation Monitoring and Reporting Program

CEQA requires lead agencies to adopt a reporting and mitigation monitoring program for the changes to the project that it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment (CEQA section 21081.6, *CEQA Guidelines* section15097). A Mitigation Monitoring and Reporting Plan (MMRP) for the proposed project will be prepared based on the mitigation measures included in the Final EIR.

1.4 Scope of the EIR

Based on the NOP, and on the scoping comments received, this Draft EIR addresses the following environmental issues:

- Land Use and Agricultural Resources
- Geology and Soils
- Hydrology and Water Quality
- Biological Resources
- Transportation
- Air Quality and Climate Change
- Noise
- Hazards and Hazardous Materials
- Public Services and Utilities
- Aesthetics
- Cultural Resources

The specific topics evaluated are described in each of the technical sections presented in Chapter 4.

1.5 Organization of the Draft EIR

The chapters of this Draft Program EIR are as follows:

Executive Summary. This chapter summarizes the contents of the Draft EIR.

Chapter 1 Introduction. This chapter describes the type of EIR, intended uses of the EIR, the environmental review and approval process and document organization.

Chapter 2 Project Background. This chapter provides background information for the proposed project.

Chapter 3 Project Description. This chapter provides an overview of the proposed Metro Plan, describes the objectives of the proposed project, and provides detail on the characteristics of the near-term and future project elements.

Chapter 4 Environmental Setting, Impacts and Mitigation Measures. This chapter describes the environmental setting for each technical issue area, discusses the project-specific and cumulative environmental impacts associated with the construction and operation of the proposed Metro Plan, and identifies mitigation measures.

Chapter 5 Other CEQA Considerations. This chapter includes a summary of cumulative and significant and unavoidable impacts evaluated in each technical issue area included in Chapter 4. This chapter also includes a discussion of the potential for the proposed project to induce growth, and a discussion of significant irreversible environmental changes associated with the construction and operation of the proposed project.

Chapter 6 Alternatives Analysis. This chapter describes potential alternatives to the proposed project, along with an analysis of suitability towards meeting proposed project objectives and differences in environmental impacts when compared to proposed project impacts. This chapter also identifies the Environmentally Superior Alternative.

Chapter 7 Report Preparers. This chapter identifies those involved in preparing this Draft EIR, including persons and organizations consulted.

Chapter 8 References. This chapter lists all the references cited in the Draft EIR.

Chapter 9 Acronyms and Abbreviations. This chapter defines the acronyms and abbreviations used in this Draft EIR.

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CHAPTER 2
Background

This chapter presents background information for the development of the Metro Plan Update and existing City water supply sources.

2.1 Project Background

The Metro Plan Update would refine and bring up to date the 1996 Metro Plan. Over the past 12-plus years, population growth, land development and water use trends, institutional and regulatory issues, and other factors have shifted, motivating this planning effort. The engineers and planners tasked with preparing the Metro Plan Update have reviewed and evaluated a broad variety of water demand and facility information including new population projections, and physical and institutional changes which have occurred since 1996 and have identified the following changes:

- **Growth in Water Demand.** Fresno's population and associated water demand grew faster than was projected in the 1996 Metro Plan Update.
- **Need for Additional Water System Facilities.** The existing water system infrastructure is inadequate to meet future demand. The City's predominant use of groundwater wells is no longer considered sustainable due to groundwater level declines and degradation of water quality.
- **Refocused Study Area.** The 1996 Metro Plan evaluated the entire Fresno-Clovis metropolitan area. To meet the future needs and challenges of the City, this Metro Plan Update is focused entirely on the City and its defined SOI.

2.2 Existing Water Supply

The City of Fresno Water Division (Water Division) serves an estimated population of 514,090 (as of January 1, 2013) located in the City limits and SOI. Areas not served by the Water Division within the SOI include areas served by: the Bakman Water Company; Pinedale County Water District; Park Van Ness Mutual Water Company; California State University at Fresno (CSU Fresno); and private groundwater users located within County islands in the City SOI.

The City holds diversified rights to obtain both surface water and groundwater. The City rights to obtain surface water from the San Joaquin River through the United States Bureau of Reclamation's (USBR) Central Valley Project Friant Division and Kings River water through the Fresno Irrigation District (FID). The City has long-established rights to pump groundwater from the regional (Kings) groundwater subbasin. The City also recharges and banks its treated municipal wastewater in the groundwater basin for subsequent reuse.

In 2012, the City met water demand by using 86 percent groundwater and 14 percent treated surface water. Prior to the 2004 opening of the City's Northeast (NE) Surface Water Treatment Facility (SWTF), groundwater accounted for 100 percent of the City's water supplies delivered to its customers. Prior to 2004 and continuing in the present, the City manages its surface water and recycled water through agreements with FID. The following sections describe existing groundwater and surface water supply sources in more detail.

2.2.1 Groundwater

The City's groundwater supplies are extracted from the Kings Subbasin, which is a subbasin of the San Joaquin Valley Groundwater Basin (SJV Basin). The City currently operates approximately 270 municipal supply wells, and until late 2004, relied solely on pumped groundwater to meet water demands within its service area.

Groundwater levels in the Fresno area have declined by an average of about 1.5 feet per year since 1990. The slowest groundwater level declines (less than 0.5 feet per year) were generally observed in the southwestern portion of the City in the downtown area, while groundwater level declines were observed to increase to one foot per year northeast of the downtown area, and as high as 1.5 feet per year in the northern and southeastern (near the Fresno Air Terminal) portions of the City. The largest average annual groundwater level declines (three feet per year) were observed in the northeastern area of the City, near the City of Clovis border.

2.2.2 Surface Water

The City of Fresno currently has three sources of surface water supplies:

- Rights to Kings River water through FID;
- Rights to San Joaquin water through the Friant Division of the USBR Central Valley Project (CVP); and
- Surface water obtained from FID in exchange for City recycled water, pursuant to the City – FID Exchange of Recycled Water agreement.

Some of these available surface water supplies are treated at the City's existing NE SWTF located in northeast Fresno and some are used for intentional groundwater recharge. The information below, included in the City's 2010 Urban Water Management Plan, indicates the amount of water available for diversion during "Normal Years". A normal year is a hydrologic year classification that averages "normal wet" and "normal dry" years based on available water data 1964 to 2002.

Kings River Surface Water

FID holds the most senior water rights on the Kings River. As the urban boundaries of the City have grown, it has annexed portions of the FID service area and assumed the obligation to provide water service to those lands. As a result, the City is entitled to a portion of FID's Kings River water rights and supplies. Currently, the City and FID manage those supplies through a contract dated May 25, 1976, through which FID and the City manage the City's pro rata share of FID's water entitlements on the Kings River. Table 2-1 presents the FID Kings River water projected to be available to the City during normal years.

TABLE 2-1
FID KINGS RIVER DIVERSIONS PROJECTED TO BE AVAILABLE TO THE CITY FOR EACH HYDROLOGIC YEAR TYPE (ACRE FEET OR AF)

Classification	2015	2020	2025
Wet	126,400	139,100	151,800
Normal-wet	115,200	126,800	138,400
Normal	105,400	115,900	126,500
Normal-dry	96,500	106,200	115,800
Dry	86,600	95,300	104,000
Critical-high	62,800	69,100	75,400
Critical-low	54,600	60,100	65,600

SOURCE: City of Fresno, 2012

CVP Friant Division Surface Water

In December 2010, the City executed a permanent contract with the USBR authorized under Section 9(d) of the Reclamation Project Act of 1939 providing the City with a permanent supply of surface water supplies from the USBR. USBR oversees diversions from the San Joaquin River through the Friant-Kern Canal of the CVP. The USBR owns the Friant-Kern Canal and the Friant Water Authority maintains and operates the Friant Kern Canal. The City's total entitlement from the USBR is 60,000 acre-feet per year (AFY) of Class 1 water.

USBR Class 1 water is generally water available from Millerton Lake, and is a very dependable water supply, regardless of the type of hydrologic water year. Class 2 water is generally any excess water available as determined by USBR, and is not considered as dependable as Class 1 water. The projected surface water available for the City to purchase from the USBR during each hydrologic year defined by the 2006 Settlement Agreement is summarized in Table 2-2. As shown in Table 2-2, the projected water supply from the USBR, during each hydrologic year type, does not change over time. Unlike the City's contract with FID, the entitlement the City has with the USBR is not tied to growth of the City's water service area.

TABLE 2-2
USBR ENTITLEMENT PROJECTED TO BE AVAILABLE TO THE CITY FOR EACH HYDROLOGIC YEAR TYPE (AF)

Classification	2015	2020	2025
Wet	60,000	60,000	60,000
Normal-wet	60,000	60,000	60,000
Normal	58,200	58,200	58,200
Normal-dry	56,200	56,200	56,200
Dry	39,200	39,200	39,200
Critical-high	25,200	25,200	25,200
Critical-low	13,900	13,900	13,900

SOURCE: City of Fresno, 2012

Recycled Water (Treated Wastewater) Exchange Agreement for FID Surface Water

Essentially all of the City's municipal wastewater is treated and spread in percolation basins to recharge the local groundwater basin, for storage and for subsequent reuse. Currently, the City makes available a portion of its recycled water for FID's use. Through a contract with FID, the City delivers recycled water into FID canals for agricultural uses.

In exchange for the recycled water, FID provides the City with surface water from either FID's Kings River entitlement or its Class 2 USBR water. Currently, this contract quantifies the surface water that FID is required to provide and is limited to 46 percent of the groundwater that the City pumps into FID's delivery canal. The contract further limits the annual quantity that can be pumped into FID's canals to 30,000 AFY or 100,000 acre-feet (af) over a 10-year period. Based on a 46 percent return from FID, the City is entitled to obtain 13,800 af (or 46 percent of 30,000 AFY) from FID during all hydrologic conditions. Table 2-3 presents the exchange water projected to be available to the City.

TABLE 2-3
EXCHANGE WATER PROJECTED TO BE AVAILABLE TO THE CITY (AF)

Classification	2015	2020	2025
All Hydrologic Years (Wet, Normal-wet, Normal, Normal-dry, Dry, Critical-high and Critical-low)	13,800	13,800	13,800

SOURCE: City of Fresno, 2012

2.2.3 Summary of Existing and Future Surface Water Supplies

Table 2-4 provides a summary of the City's estimated available existing and projected surface water supplies based on the information described above. As shown, the City's projected future surface water supplies in normal years are expected to increase to 198,500 AFY by 2025 as the City's supply from the FID Kings River increases (as agricultural areas within FID's service area are annexed into the City).

TABLE 2-4
EXISTING AND FUTURE SURFACE WATER SUPPLIES PROJECTED TO BE AVAILABLE DURING NORMAL YEARS (AF)

Surface Water Supply	2015	2020	2025
Kings River	105,400	115,900	126,500
USBR CVP Friant Division	58,200	58,200	58,200
Recycled / Exchange Water	13,800	13,800	13,800
Total Surface Water Supply in Normal Years	177,400	187,900	198,500
Planned Future Surface Water Treatment Capacity [a, b]	30,800	123,400	123,400

a. The existing treatment capacity for the NE SWTF is 30,800 AFY or 30 gallons per day (mgd).
b. Planned future treatment capacity includes: constructing a new 80 mgd Southeast (SE) SWTF to be located in the southeast portion of the City beginning in spring of 2015 and completed by winter 2018; and expanding the existing NE SWTF from 30 mgd to 60 mgd about 2020. The proposed new Southwest (SW) SWTF is not included as it is anticipated to be constructed sometime after 2025. Annual treatment capacity assumes that the SWTFs are out of service for one month of the year for maintenance activities.

SOURCE: City of Fresno, 2012

CHAPTER 3
Project Description

3.1 Introduction

The purpose of the Metro Plan Update is to update and refine the 1996 Metro Plan taking into consideration available new data and accommodating physical and institutional changes which have occurred since the 1996 Metro Plan was prepared. The completed Metro Plan Update would facilitate future water resource decisions and utility planning, and could assist in the pursuit of potential funding opportunities. Implementation of the City's recommended water supply plan would result in a more optimized and efficient conjunctive use of the City's available water resources, which will enhance the City's overall water supply reliability. The proposed Metro Plan Update includes near-term and future project elements including surface water treatment facilities, regional transmission facilities, groundwater facilities, potable water storage facilities, recycled water facilities, and water conservation measures.

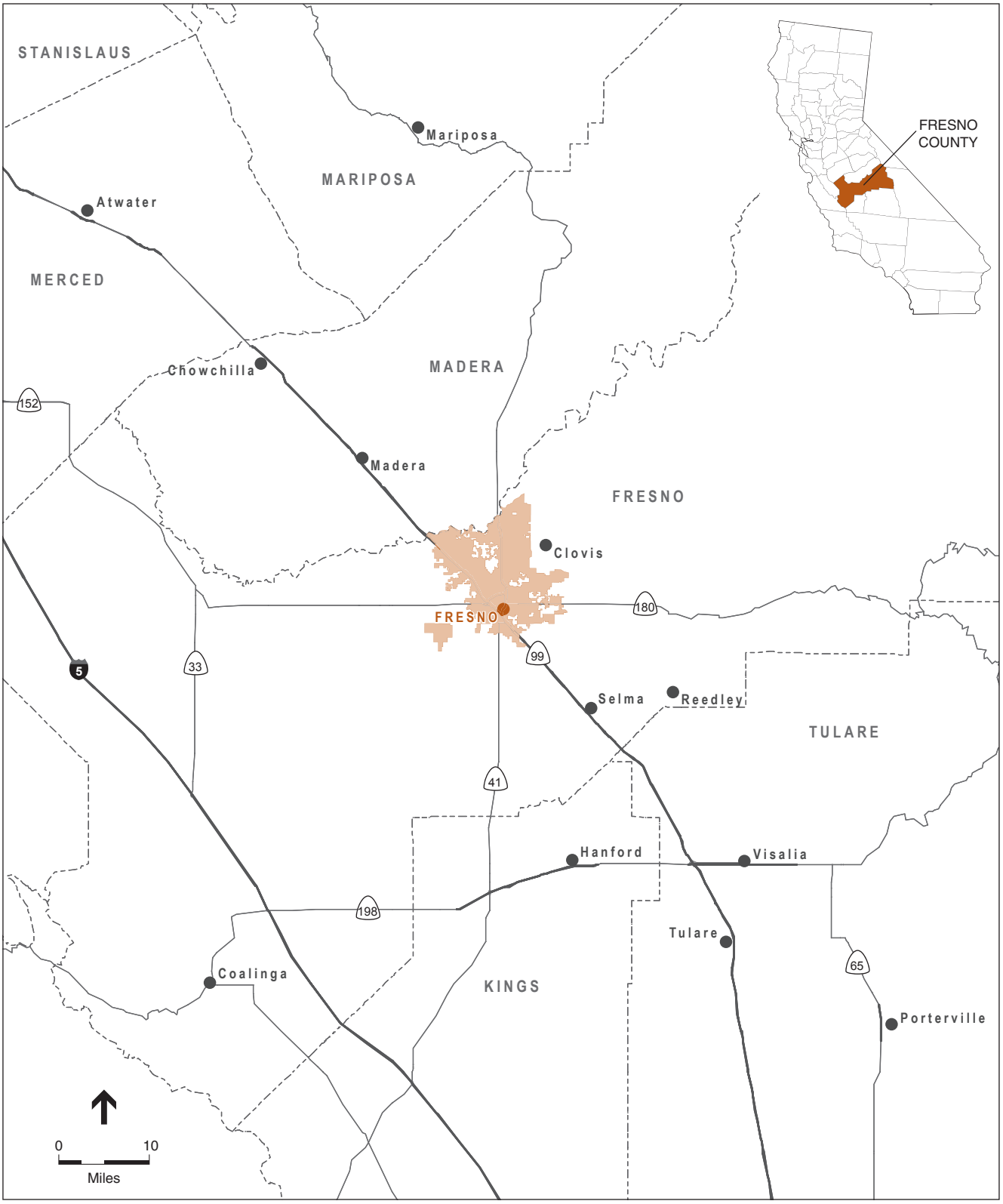
3.2 Project Location

The City is located in California's Central Valley in northern Fresno County primarily east of State Highway 99. The City is located approximately 170 miles south of the City of Sacramento and 220 miles northeast of the City of Los Angeles (see Figure 3-1). The Fresno-Clovis metropolitan area, with a current population of 1,002,046, is the second largest metropolitan area in the Central Valley after the Sacramento metropolitan area. The City is the county seat of Fresno County, the fifth largest city in California, and currently encompasses approximately 110 square miles in geographic area. The project area for the Metro Plan Update includes the existing city limits, the City of Fresno SOI, and unincorporated Fresno County east of the City, within the City's SOI (see Figure 3-2).

3.3 Project Objectives

The overall objective of the City's Metro Plan Update is to provide sustainable and reliable water supplies to meet the demand of existing and future customers through 2025. The overall goals are to:

- Optimize the conjunctive use of the City's available surface water, groundwater, and recycled water supplies for direct treatment and use, and intentional groundwater recharge;
- Balance the City's groundwater operations by 2025;
- Replenish groundwater basin storage;



SOURCE: DeLorme Street Atlas USA, 2000; ESA, 2013

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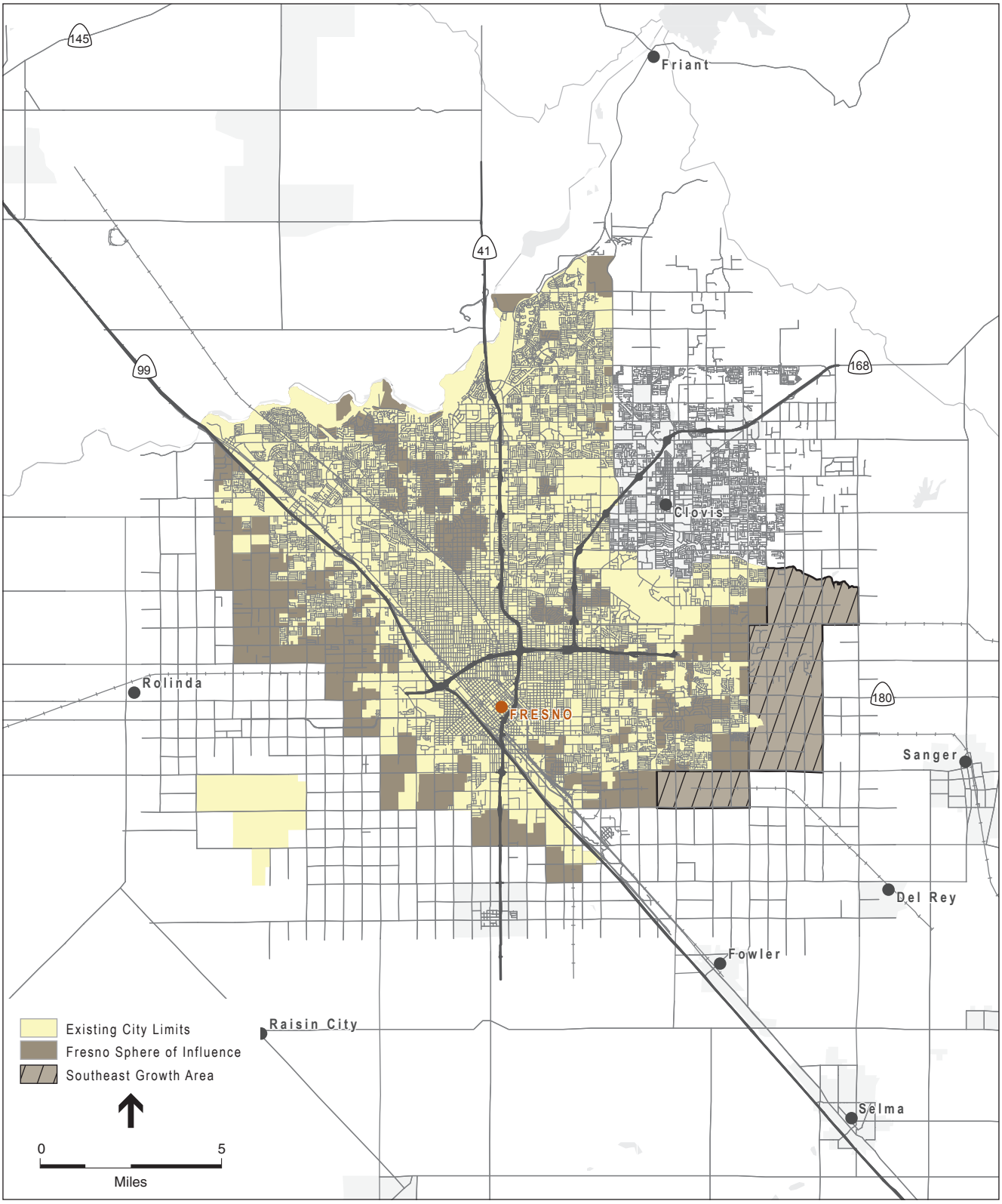
Figure 3-1
Regional Location



SOURCE: ESRI, 2008; West Yost, 2009; City of Fresno, 2009; ESA, 2013

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Figure 3-2
City of Fresno Project Area

- Continue to implement and expand demand management/water conservation measures in compliance with the City's USBR contract and to achieve specific water conservation goals; and
- Utilize recycled water to meet in-City non-potable demands in new development areas and existing parts of the City.

3.4 Proposed Project

3.4.1 Metro Plan Update Overview

The Metro Plan Update proposes a comprehensive and integrated water supply plan to better manage the City's diverse water supplies, address groundwater level declines beneath the City's service area and groundwater quality concerns, and further balance and optimize the City's conjunctive use of its diversified water supply portfolio which would ultimately enhance overall water supply reliability. Key components of the proposed Metro Plan Update include:

- **Expand Demand Management and Water Conservation Measures.** Complete implementation of the on-going residential water metering program by 2013 and implementation of additional water conservation measures (at the time this Draft EIR was published the metering program had been completed).
- **Expand Use of Treated Surface Water Supplies.** Increase surface water treatment capacity by constructing and operating a new Southeast (SE) Surface Water Treatment Facility (SWTF), an expanded Northeast (NE) SWTF and potentially a new Southwest (SW) SWTF.
- **Balance In-City Groundwater Operations by 2025.** Reduce City's groundwater pumping and increase intentional groundwater recharge with a goal of balancing the City's groundwater operations within the City's service area (e.g., pumping equal to recharge) by 2025.
- **Use Recycled Water Supplies for Non-Potable Water Demands.** Maximize the direct use of recycled water for in-City non-potable water uses and thereby reduce potable water demands.
- **Assess Need and Availability of Future New Supply.** Assess the need for and timing of future new water supplies once future growth plans beyond buildout of the 2025 General Plan is determined.

The Metro Plan Update includes:

- **Objectives, Goals and Policies.** Metro Plan Update objectives, goals and policies target conjunctive use of available groundwater and surface water supplies to optimize use of available surface water supplies; and the management of the local groundwater basin in a sustainable manner, which minimizes or eliminates localized groundwater overdraft and groundwater quality degradation.
- **Operational Principles.** The operational principals would guide conjunctive use and development of water supply operations throughout the Plan area. Specific operational principles have been developed to: (1) maximize the use of treated surface water from the City's existing and planned SWTFs in conjunction with the City's groundwater supplies; and (2) use existing and proposed groundwater recharge facilities to ensure balanced City groundwater operations by 2025.

- **Water Supply Components.** How the City intends to develop and use treated surface water, groundwater, demand management /water conservation measures, recycled water and any potential new water supplies to meet existing and future water demands.
- **Proposed Facilities.** New water supply facilities are needed to support implementation of the Metro Plan Update. Facility improvements are proposed for all of the water supply components – treated surface water facilities, water transmission mains and distribution pipelines, groundwater wells, groundwater recharge basins, recycled water facilities, plus facilities to implement demand management measures such as modification of landscapes to conserve water. Facility construction would be phased based upon what is needed in the near-term and what is to be completed for 2025 General Plan buildout.
- **Proposed Near-term Projects.** Development and operation of three near-term projects would be evaluated at a project-level. Near-term projects include upgrades to the existing NE SWTF; construction of a new SE SWTF, with 80 million gallons per day (mgd) total design capacity; and regional water transmission mains and distribution pipelines located throughout the project area.

The proposed Metro Plan Update describes proposed project elements which are summarized below and presented in Figure 3-3 and Figure 3-4. Project elements are proposed as both near-term and future projects which are described in more detail below in subsections 3.4.2 and 3.4.3.

Surface Water Treatment Facility and Storage Facilities

Table 3-1 summarizes proposed future surface water treatment facilities and their proposed capacity.

TABLE 3-1
PROPOSED FUTURE SURFACE WATER TREATMENT CAPACITY

Surface Water Treatment Facility	Design Capacity (Average Treatment Capacity)[a], mgd	Annual Production Capacity, AFY
New SE SWTF (by 2018)	80 mgd (70 mgd)	72,000 AFY
Existing NE SWTF		
Current Design Capacity	30 mgd	30,800 AFY
Future Expansion (Additional 30 mgd) (by about 2020)	60 mgd (50 mgd)	51,400 AFY
Future SW SWTF (by about 2025) [b]	10 to 20 mgd	10,000 to 20,000 AFY
Total Nominal Future SWTF Treatment and Production Capacity[c]	140 mgd (120 mgd)	123,400 AFY

a. Average treatment capacity is based on an 11-month operations period each year to produce the required quantity of treated surface water for direct use.
b. Future construction of a new SW SWTF in the southwestern part of the City to provide added flexibility for serving future demands in that portion of the City.
c. Total does not include potential new SW SWTF, for which the timing and treatment capacity will be determined in the future.
SOURCE: City of Fresno, 2012

New potable water storage facilities located at key locations in the City to provide operational flexibility during peak demand periods and provide emergency storage capacity.

Groundwater

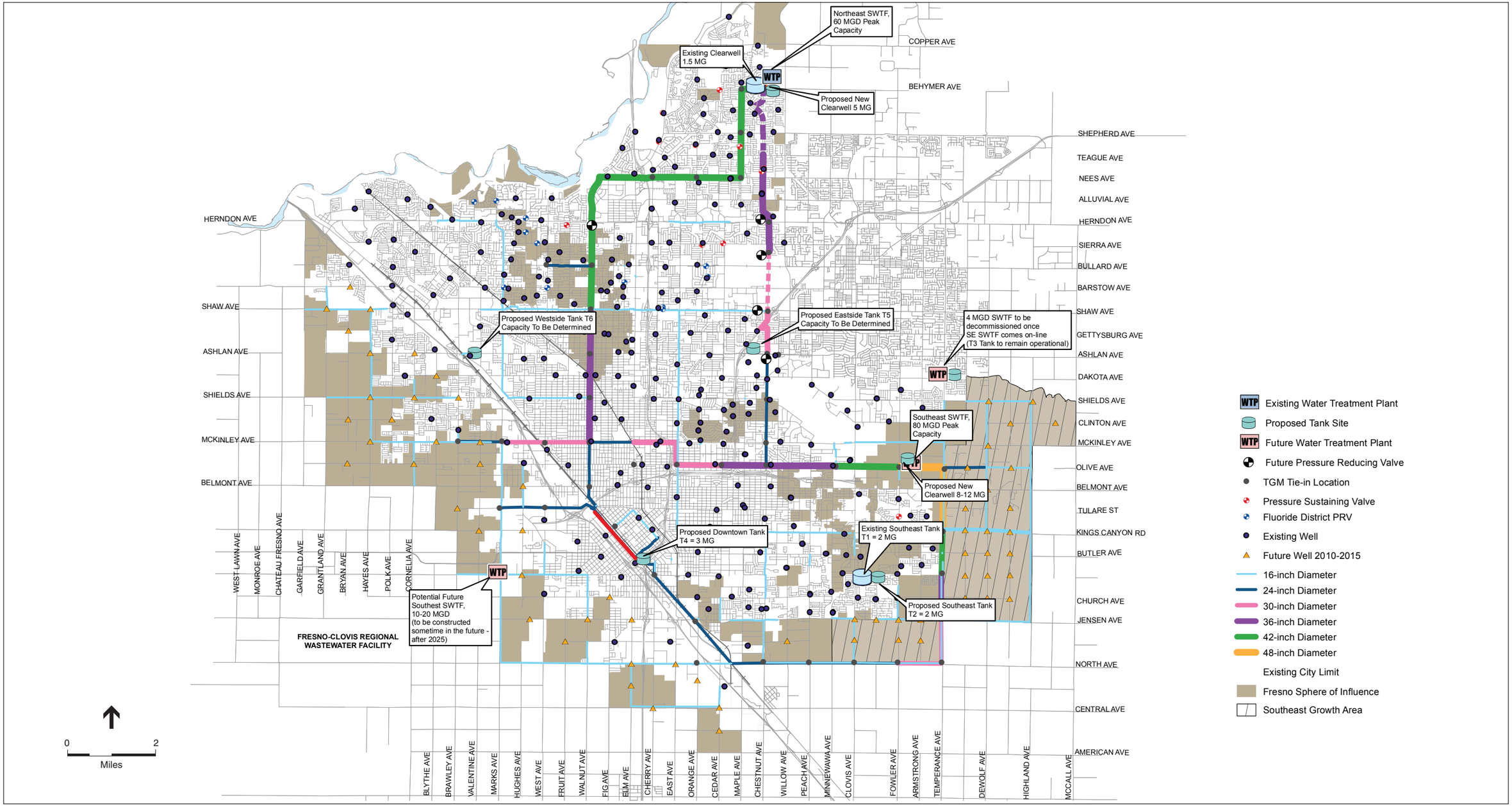
- Reduction in City's annual groundwater use and maintenance of existing intentional groundwater recharge quantities to achieve and maintain balanced City groundwater operations;
- Increased City recharge capacity (20,500 AFY additional) through the increased use of existing recharge facilities and construction and maintenance of new recharge facilities (approximately 340 acres of additional recharge area) to allow for increased recharge in years when surplus surface water is available to help restore groundwater levels to historical levels;
- Additional intentional groundwater recharge may be achieved through the construction of City expanded or new recharge basins and/or the development of an Aquifer Storage and Recovery (ASR) Well System.

Recycled Water Supplies

The City of Fresno Recycled Water Master Plan was adopted by the City and the EIR (SCH# 2010051015) was certified by the City of Fresno in April 2013. The Recycled Water Master Plan EIR is on file for review at the City of Fresno Wastewater Management Division located at the Fresno-Clovis Regional Water Reclamation Facility, 5607 West Jensen Avenue, Fresno, California. The Recycled Water Master Plan identifies potential recycled water use opportunities within the City and its SOI and includes a plan for the installation and operation of treatment, storage and distribution infrastructure to serve the City and SOI. In addition to the Recycled Water Master Plan, the City intends to consider the adoption of a "Recycled Water Ordinance" to assist the City in implementing the Recycled Water Master Plan. The purpose of the ordinance would be to establish water recycling policy and criteria for its use within the current City limits as well as its SOI as lands within the SOI are annexed into the City. More specifically, the Ordinance would contain provisions addressing various topics related to implementation of the goals, policies and objectives of the Master Plan.

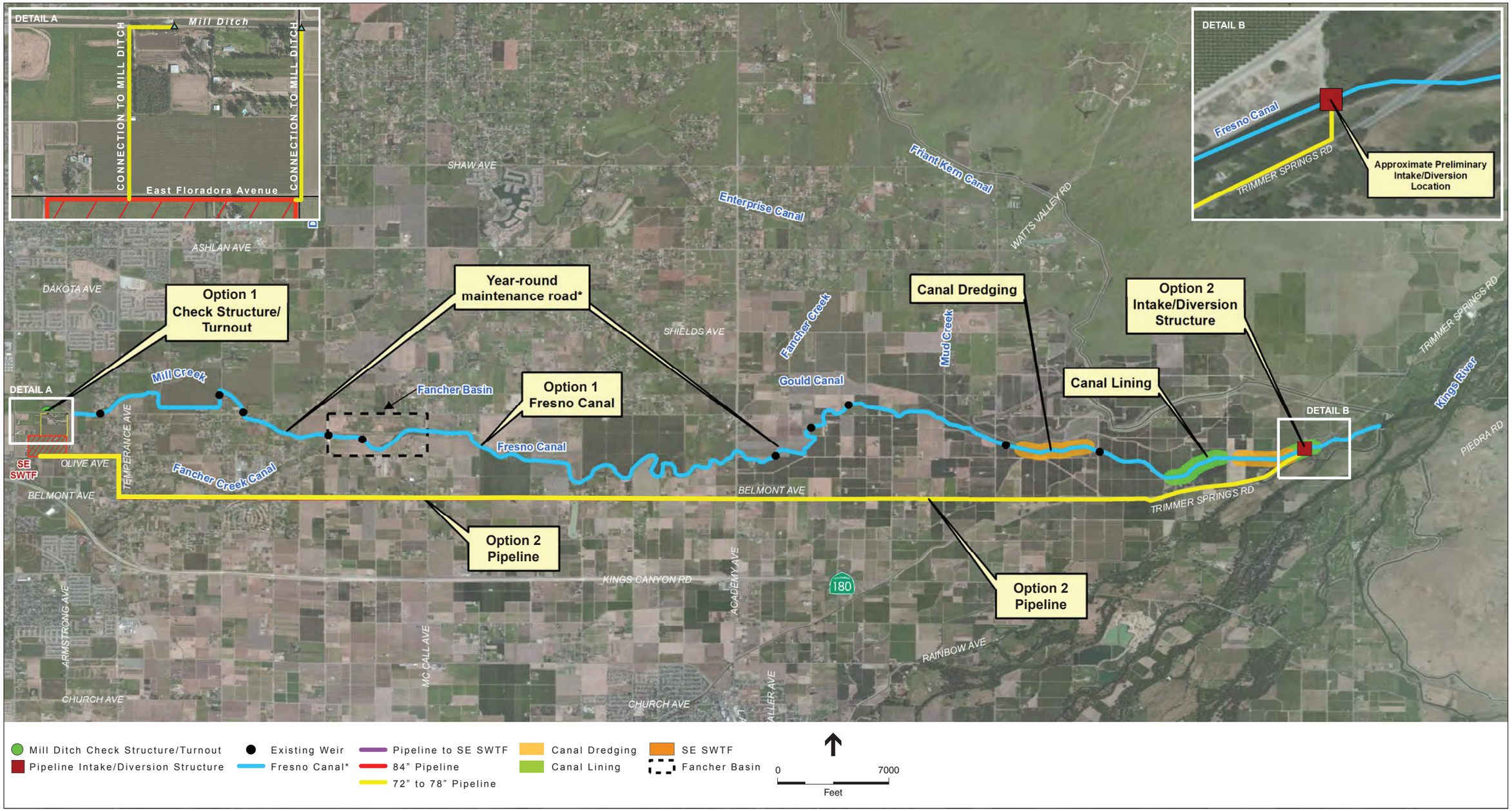
A brief description of the topics discussed in the Recycled Water Master Plan is provided below. The Metro Plan Update takes into account the City's anticipated future use of recycled water as part of its overall future water supply plan. However, the Metro Plan EIR does not re-analyze the construction and operation of specific recycled water facilities as they were analyzed in the certified Recycled Water Master Plan EIR.

- Introduction of recycled water supply for landscape irrigation and other non-potable uses to offset potable water demands:
    - Use of North Fresno Regional Wastewater Reclamation Facility (RWRF) to irrigate Copper River Golf Course (initially 750 AFY, increasing to 1,000 AFY by 2015)
    - Use of up to 25,000 AFY of recycled water for landscape irrigation and other non-potable uses in new development areas and existing parts of the City by 2025 (highly treated recycled water to be produced at new satellite plants, stand-alone plants and/or an expanded RWRF)



SOURCE: City of Fresno, 2009; ESRI, 2009; West Yost, 2014; ESA, 2014

Figure 3-3
Proposed Project – Overview



SOURCE: Carollo Engineers, 2013; ESA, 2013

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Figure 3-4

Raw Water Diversion and Conveyance Options

Water Conservation

- Water conservation measures including:
    - Completing residential water metering program (completed)
    - Implementing rebate programs for water conserving devices and systems
    - Implementing Commercial, Industrial, and Institutional water conservation programs
    - Joining the California Urban Water Conservation Council and participating in informational and training workshops and jointly-funded water conservation programs
    - Enacting a Retrofit Upon Resale Ordinance
    - Implementing Turf Replacement Rebates ("Cash for Grass")
    - Developing a Landscape Water Audit and Budget Program
    - Developing a Prioritized Leak Detection Program
    - Conducting a Complete Water System Audit
    - Billing with Commodity Rates (and eventually Tiered Rates)

3.4.2 Near-term Project Elements

Proposed near-term elements for the Metro Plan Update are summarized in Table 3-2 and described below. Near-term elements are analyzed at a project level in this EIR.

TABLE 3-2
NEAR-TERM PROJECT ELEMENTS

Infrastructure Component	Description
Surface Water Treatment Facilities	New SE SWTF • New SWTF with total design capacity of 80 mgd • Raw water intake and conveyance facilities to SE SWTF • New clearwell (8 to 12 million gallons) • Emergency water supply storage • Settling basins and drying beds • Operations building • Potential relocation of the existing City Department of Public Utilities Water Division Administrative Offices and Corporation Yard (i.e. Water Yard) to the SE SWTF property • Solar and hydro power facilities to provide an on-site energy source • Emergency generators • Ancillary support uses (parking, landscaping, fencing) Existing NE SWTF • Operational improvements to increase from current 27.5 mgd operational capacity to 30 mgd design capacity • Expansion of existing SWTF design capacity from 30 to 60 mgd • New 5.0 MG clearwell (in addition to existing 1.5 MG clearwell)
Potable Water Regional Transmission Facilities	Extensive new potable water transmission system pipelines to distribute treated surface water supplies from the SWTFs to customers: • Regional transmission main from proposed SE SWTF west in Olive Avenue, north in First Street, and west in McKinley Avenue or Belmont Avenue, then south in Palm Avenue • Regional transmission main from the proposed SE SWTF east in Olive Avenue,

TABLE 3-2
NEAR-TERM PROJECT ELEMENTS

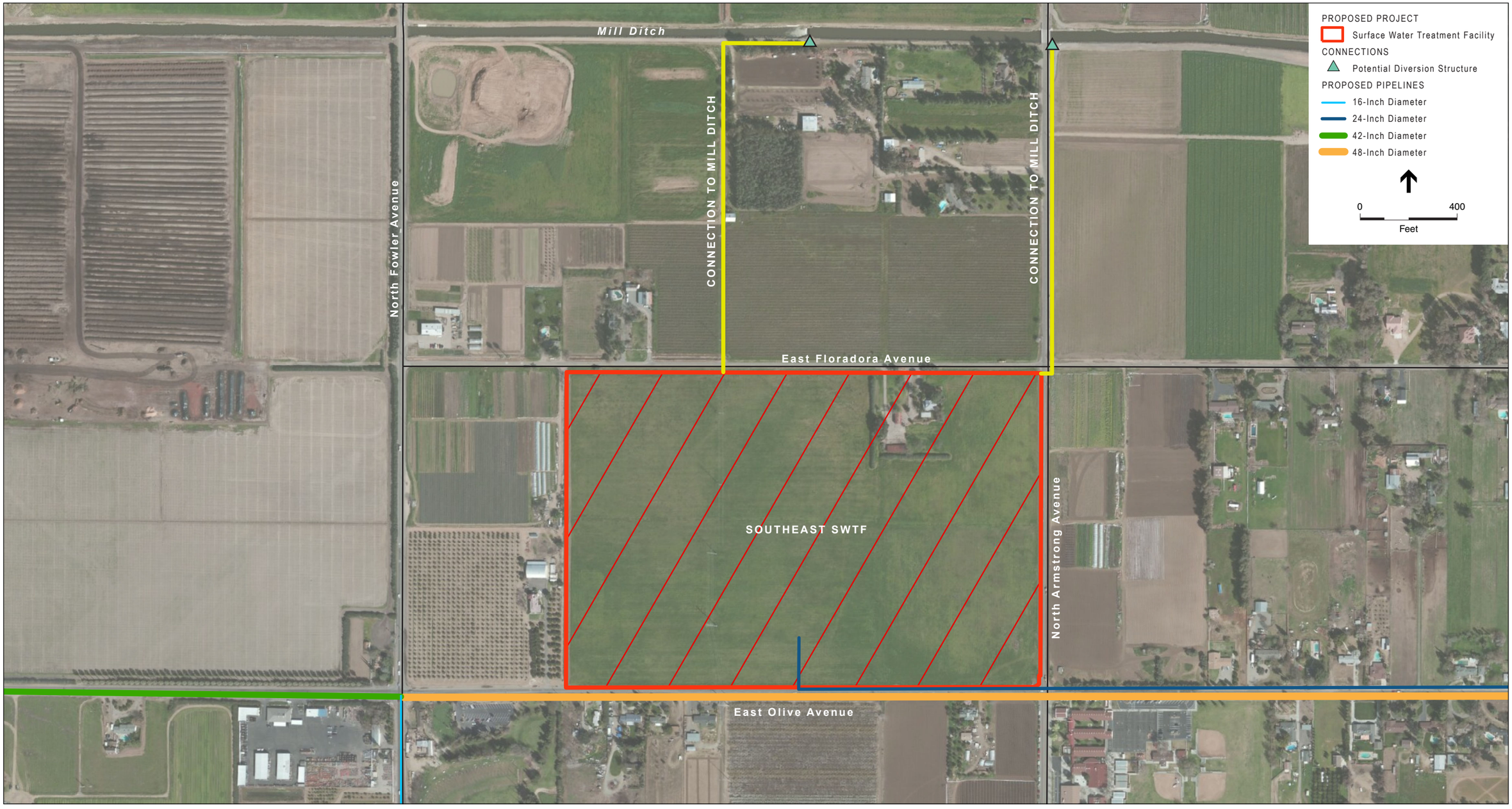
Infrastructure Component	Description
	south in Temperance Avenue, west in North Avenue until the intersection with the railroad tracks, then northwest parallel to the railroad tracks, possibly along Golden State Highway, connecting to the Downtown storage tank located near H Street and Santa Clara • Regional transmission main from proposed SE SWTF east in Olive Avenue to DeWolf Avenue to serve the proposed Southeast Growth Area • Regional transmission main from NE SWTF along Behymer Avenue to Maple Avenue, Maple Avenue to Nees Avenue, Nees Avenue to Palm Avenue , and Palm Avenue to McKinley Avenue • Northerly crossing beneath Highway 99 and railroad, along McKinley Avenue.

New 80 MGD SE SWTF

Based on the overall objective of providing a sustainable and reliable water supply for the City for the future, the Metro Plan Update recommends optimizing the conjunctive use of available surface water, groundwater, and recycled water supplies, balancing groundwater operations and replenishing groundwater storage to improve the reliability and diversity of the City's water supply portfolio. A new SE SWTF is proposed to help meet these objectives. The proposed SE SWTF site would be located on a 58-acre property at the northwest corner of Armstrong and Olive Avenues (see Figure 3-5). Treated surface water supplies from the proposed new SE SWTF would serve existing and future customers in the southern part of the City's water service area within the City's SOI. A conceptual site plan layout is shown in Figure 3-6.

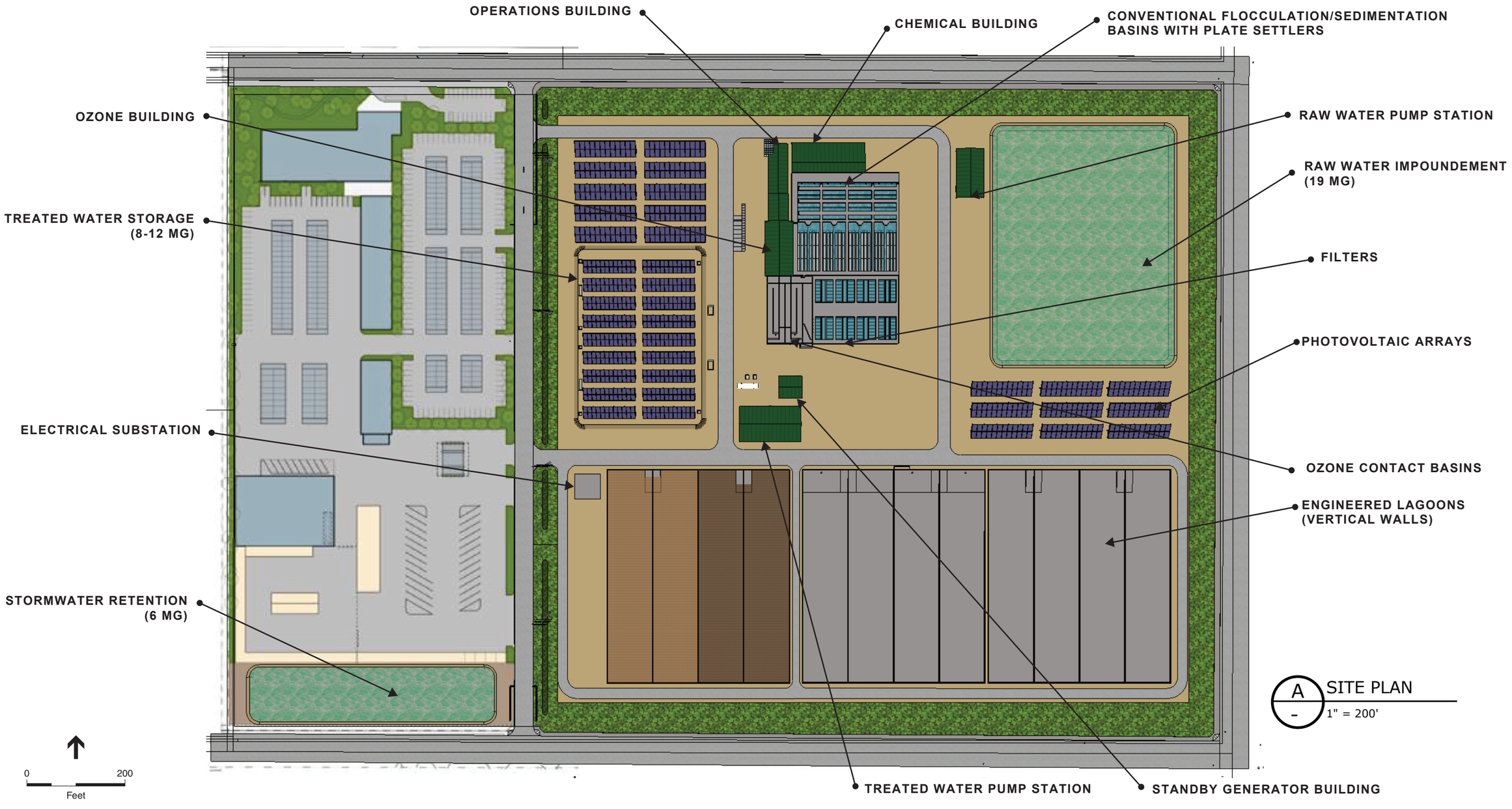
The proposed 80 mgd design capacity for the SE SWTF would allow the City to treat up to 72,000 AFY of surface water supplies for direct use (based on an average treatment capacity of 70 mgd for 11 months of the year assuming a Mill Canal raw water conveyance system), or approximately 89,600 AFY assuming the full 80 mgd capacity for 12 months served via a raw water conveyance pipeline which is not associated with Mill Canal. In either conveyance scenario, the source of raw water for the SE SWTF is the Kings River. Kings River water would be delivered via FID's Fresno Canal and the Mill Canal (Conveyance Option 1) or through a new intake/diversion and raw water transmission pipeline located east of the SE SWTF along the Fresno Canal (Conveyance Option 2). These two conveyance options are shown in Figure 3-4 and described in more detail in the Raw Water Diversion and Conveyance section.

The SE SWTF would operate continuously, 24 hours per day, every day of the year at various flow rates during the year with ongoing operations and maintenance, similar to the existing NE SWTF. Staffing levels would be in accordance with the requirements of the California Department of Public Health (DPH) for operating the facility at all times (i.e., 24 hours per day, 365 days per year) in order to adequately monitor the treatment processes and ensure production of treated water quality that continuously conforms to the drinking water standards. Up to 15 new facility staff would be required for the proposed project and would likely include a Facility Superintendent, Senior Facility Operator(s), Shift Operators, Senior Maintenance Technician, and Maintenance Technician(s).



SOURCE: ESRI, 2009; City of Fresno, 2009; West Yost, 2010; ESA, 2013

Figure 3-5
Proposed Project –
Southeast Surface Water Treatment Facility



SOURCE: Carollo Engineers, 2013; ESA, 2014

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Figure 3-6

SE SWTF Site Layout

Treatment Process

Water quality concerns for treating raw water include the removal of turbidity and particles from the water during high turbidity events, the control of disinfection by-products, the control of tastes and odors if they are present, and the control of distribution system corrosion. Among the water quality issues with raw water are increased levels of microbes, disinfection by-product precursors, tastes and odors due to algae, and potential trace levels of organic chemicals. Surface water would be treated to produce a potable supply meeting drinking water standards as set forth in regulations established by the United States Environmental Protection Agency (EPA) and the DPH, which has primacy in enforcing drinking water regulations in California.

Like the existing NE SWTF, the proposed SE SWTF would be a conventional treatment facility using ozone, deep bed granular activated carbon gravity filters, and chlorine disinfection. A conventional process is less sensitive to raw water quality changes than other processes and provides the greatest flexibility in addressing various water quality parameters. Secondary unit processes such as pH adjustment, and corrosion control can also easily be incorporated into the conventional treatment process as necessary.

The proposed treatment process would include a two unit process for removing suspended material from the water: clarification and filtration. The clarification process would involve the addition of coagulants in a flash mix facility at the beginning of the process to coagulate particulates (sediments) in the raw water to heavier clumps of the particulates, called "floc." The floc would flow to settling basins for removal. After clarification, the remaining suspended material in the water would be removed by filtration through granular dual-media filters composed of anthracite or granular activated carbon and sand.

Ozone would be used as the primary disinfectant at the facility. Ozone would provide an effective barrier to *Cryptosporidium* and *Giardia*, microscopic parasitic pathogens often present in raw surface water. The ozone would be generated on-site and fed at a set of contact basins placed at an intermediate location in the process, just after flocculation/sedimentation (also called clarification), and ahead of filtration. Ozone typically has a 90 to 95 percent transfer rate to the water. Any off-gasses would be destroyed to a level acceptable to the Occupational Safety and Health Administration (OSHA) and the San Joaquin Valley Air Pollution Control District (SJVAPCD). Ozone does not provide residual disinfection properties as required by DPH, so chlorine (as a six percent liquid solution of sodium hypochlorite) would be added to the filtered water to maintain disinfection residual in the distribution system.

Taste and odor compounds from algae and trace levels of organic compounds would be removed with ozone. The pH, and possibly the carbonate alkalinity, of the treated water would be adjusted as needed after chlorine contact, to make the water less corrosive to distribution system pipelines. If needed, a corrosive inhibitor chemical could also be applied.

Specific chemicals to be used and stored on site are described below.

Treatment Chemicals

All chemicals anticipated to be used at the SE SWTF are common to the drinking water treatment industry and are routinely used at surface water treatment facilities. These would include, but might not be limited to:

- Alum (aluminum sulfate) would be used for the primary coagulant feed system. Alum has shown excellent performance removing suspended particles and disinfection by-product precursors. In addition, poly-aluminum chloride could also be used. All chemicals would be stored in approved vessels.
- A cationic polymer could also be used as a coagulant aid, and an anionic (or non-ionic) polymer would be added as a flocculent and filter aid. Both types of polymers are most conveniently handled in their liquid forms and would be stored on-site in above-ground tanks in the chemical room.
- Ozone could be used as the primary disinfectant. Ozone is generated on-site by passing a high voltage alternating current across a dielectric discharge gap through which oxygen-bearing gas is injected. There are different types of ozone generators for use in water treatment plants. The design for the facility would likely be based on liquid oxygen as the feed gas rather than air because of the lower construction costs and relative ease of operation and maintenance. Chlorine could be used to provide the residual disinfection element of the treatment process. Sodium hypochlorite ("bleach" solution) would be used for this purpose. It would be delivered to the site by truck as a 12.5 percent strength solution, and stored on-site in approved above-ground tank.
- Carbon dioxide would be the primary chemical used for pH or alkalinity adjustment. (Other chemicals that could be used would include sodium bicarbonate, soda ash, caustic soda, lime (quick or hydrated), and sulfuric acid). Corrosion control chemicals such as zinc orthophosphate, polyphosphate such as sodium hexametaphosphate, and caustic silicate also could be used.

It is anticipated that the chemicals selected would be delivered and stored on site in appropriate above-ground, double-contained storage vessels that are approved for each chemical. All materials used at the facility would be transported, stored, handled and used in a manner consistent with the appropriate regulatory agency guidelines. Chemicals which are anticipated to be used at the SE SWTF are listed in Table 3-3.

TABLE 3-3
CHEMICALS ANTICIPATED TO BE USED AT THE SE SWTF

Chemical	Purpose	Injection Point
Aluminum sulfate (Alum)	Coagulation	Flash Mix Pump Discharge
Cationic polymer	Coagulation aid	Flash Mix Pump Discharge
Anionic polymer	Flocculation aid	Flocculation Basin Influent Channel
Non-Ionic polymer	Filter aid	Filter Influent Channel
Ozone	Taste and odor, organic control	Ozone Contactor, Post Sedimentation
Sodium hypochlorite	Disinfection residual	Filter Effluent Channel
Liquid Oxygen	Carbon Dioxide	

SOURCE: Based on chemicals currently used at the existing NE SWTF

In addition to water treatment chemicals, minor amounts of other chemicals would be used for equipment operation and operation of facilities (i.e., lubricants, oils, cleaning solvents, laboratory solutions). These chemicals would be stored in the operations and administration building. Diesel storage for the backup generators, if utilized, also would be located at the site. All chemical and fuel storage would be contained and safety procedures and best management practices would be implemented.

Solids Handling

Waste streams would include sludge removed from the sedimentation basins, filter backwash water, filter-to-waste water, and sampling water. Filter backwash water, filter-to-waste water, sampling water, and drying bed decant water would be treated with a polymer. Solids from the grit and equalization basins and sludge from the sedimentation basin would be sent to concrete-lined drying beds for drying. Multiple lagoons would be provided to allow for cycling and settling periods. The drying beds would be cycled on four-month cycles. Dried sludge would be transported to a landfill for ultimate disposal. The lagoons would be routinely cleaned, and the dried sludge removed approximately three times per year.

On-Site Storage Facilities and Solids Drying Beds

On-site emergency raw water storage pond facilities would be constructed to store water being conveyed in the Mill Canal by FID which couldn't be processed at the SE SWTF due to some major operational issue (if the raw water conveyance pipeline is not the City's selected conveyance option). Up to 19 MG would be stored in a single 3.9 acre storage pond located on the site. The pond would hold water at a depth of 15 feet deep with three feet of freeboard.

Operations Building

The Operations Building would provide space for the facility Control Room and offices, a small laboratory suitable for use by the operations staff for process control; a multi-purpose room for staff meetings and training activities, as well as for eating; a small kitchen; a first aid room; and men's and women's toilets, showers and lockers.

The Operations Building would also include rooms for computer equipment, electrical equipment and HVAC equipment. A maintenance shop with adjacent parts and tools storage would likely be included along with a separate room for ozone generation facilities. A portion of the Operations Building would house chemical storage/chemical delivery facilities (the building would meet standards required for chemical storage). Maintenance vehicle access would be provided. Access to the filter pipe gallery between the filters would also be provided. The Operations Building would also include a computer-based Supervisory Control and Data Acquisition (SCADA) system that would monitor treatment process and resulting water quality and respond accordingly. The SE SWTF SCADA system would interface with the Water Division SCADA system.

Fresno Water Division Administration Building and Corporation Yard

The Fresno Water Division offices would be relocated from their current locations (1910 East University Avenue, Fresno as well as City Hall and other locations) to the proposed SE SWTF site.

Existing facilities that are proposed to be relocated could include: warehouse; meter shop; four-vehicle bay maintenance shop; electrical shop and warehouse; joint conference room and crew locker room; Technical Services Section buildings; Conservation, Water Quality and Information Systems building; Engineering and Planning Section building; pipe racks; pipe fittings storage; employee parking; City vehicle parking; vehicle wash area; radio tower (100-foot high); emergency power generators; above grade motor oil and waste oil storage tanks; gas and diesel fuel pumps; covered materials storage area. Specifically, proposed facilities could include: (1) a 60,000 square foot (sf) Administrative/Engineering Operations Building; (2) 15,000 sf Shop Building; (3) 9,600 sf Fleet Maintenance Shop Building; and (4) a 26,000 sf warehouse building. All structures would be one-story in height, with the exception of the Administrative/Engineering Operations Building which would be two stories. Vehicles entering and exiting the proposed facility include semi-truck and trailers for delivery of materials, City fleet vehicles and employee and visitor vehicles. Approximately 450 parking spaces for staff and visitors would be provided on site; however, the final number of parking spaces would be determined in conjunction with final building design.

Power Supply

Electrical power would be provided by Pacific Gas and Electric (PG&E) via a 115 kilovolt (kVA) distribution line at the SE SWTF. An approximately 150 foot by 110 foot transmission distribution substation (approximately 22 feet in height) would be constructed to distribute power to the distribution line. The proposed substation would include two approximately 16 foot tall 10 megawatt (MW) transformers, PG&E metering and metering transformers, and associated primary and secondary switching. The substation would be owned, operated, and maintained by the City.

The facility would also include an emergency electrical generator of sufficient size to power all office and communication equipment in the event of an electrical power failure. This unit would be in compliance with SJVAPCD regulations for emergency internal combustion engines. The facility would also include an additional, enclosed generator with a capacity adequate to power all process and pumping equipment. On-site generation of renewable power is also proposed through the use of photovoltaic (PV) panels and/or hydro turbines to offset a portion of energy use by proposed pretreatment, ozone generation, filtration, chemical addition, and dewatering processes as well as the offices and other administrative facilities. The proposed renewable energy facilities would include installation and operation of a PV system to generate approximately 2MW of power to be used at the SE SWTF. It is assumed that the system would be placed on covered parking structures/carports, the warehouse and maintenance fleet building, covered storage structure, roof of office and shop and water storage reservoir. In addition, ground mounted solar panels could be installed on approximately 2.55 acres of the SE SWTF site.

Renewable energy could also be generated on site through the use of a hydro-turbine to be located at the raw water pipeline. While the capacity and sizing would be dependent on the head available and the flow rate through the turbine, preliminary sizing indicates a propeller turbine could be installed to generate approximately 125 kilowatt (kW) of power. This estimate

is based on 15 feet of available head and a flow to the plant of 80 MGD. The facility would require a building with approximately 2,000 sf and would be located at the SE SWTF near the pretreatment facilities.

Landscaping, Parking and Fencing

Landscaped areas would be installed along the perimeter of the site. A mix of deciduous and evergreen trees would be planted to assist in screening the basins and buildings from the adjacent roadways and homes. Parking would be provided for facility staff, as well as for visitors. A bus turnout would be provided to facilitate school bus ingress and egress. Perimeter fencing would be consistent with the proposed changes at the NE SWTF and include installation of either a seven foot masonry block wall topped with Sheppards Hooks to eight feet, or eight-foot wrought iron fence, depending on the specific location, so that the fence best integrates with the adjacent facility building. Other security measures would include installation of perimeter motion detectors and pan-tilt-zoom security system. The landscaping along the perimeter of the site would be used in conjunction with the security fencing.

Construction Considerations

The proposed SE SWTF would be constructed on a 58-acre parcel, and is expected to be operational two years after construction has begun. It is anticipated that excavation would be required during the construction of the following underground structures: intake piping and metering vault, flash mixing chamber, filters, sedimentation/flocculation basins, clearwell/pump station, stabilization basins, equalization basins, plate setters, and drying beds. Facilities anticipated to be constructed above ground would include: operations and administration building, electrical building, chemical building, access road, and wash water treatment structure. Each of these structures would be single-story, except for the Administrative/Engineering Operations Building which is anticipated to be a 2-story building.

Concrete and masonry block would be the primary construction material for facility structures. Major process piping and chemical storage tanks would be generally constructed of steel, with certain chemically resistant materials used where required for particular chemicals. The major construction phases for the new SE SWTF would be:

- Clearing and Grubbing
- Excavation and Site work
- Structural Facilities
- Electrical, Process Mechanical, and Instrumentation
- Paving and Striping
- Architectural and Landscaping
- Startup and Testing

Clearing and Grubbing

Survey staking would be used to define the limits of the SE SWTF site. Underbrush, vines, and small trees that would interfere with construction and operation of the SE SWTF would be removed from the site.

Excavation and Site work

After the SE SWTF site has been cleared of underbrush, small trees, and structures; grading would begin. It is expected that the contractor would attempt to balance cut and fill quantities within the construction area. Material excavated for water storage facilities, basins and drying beds would likely be used to create berms and/or spread across other areas of the site to establish a preliminary grade for forming all concrete slabs. Following rough grading, additional excavation would bring the site to final grade and prepare the soil for underground piping and structural slabs. Site work would involve installing large underground pipes (six-inch diameter or larger), manholes, structural foundations, curbs, gutters, and sidewalks.

Structural Facilities

This phase would consist of compacting and preparing the soil for all structural facilities. Prior to pouring concrete and/or installation of masonry units, structural forms, rebar, and conduits would be installed for each facility. After the concrete is poured, it would be finished and cured before the forms are removed. After the concrete footing, slab, and walls are poured, the overhead structural steel and roof decking would be erected.

Paving and Striping

All parking areas, roads, and designated locations would be paved and striped. Paving would be performed incrementally throughout the site area as large construction and non-rubber tread equipment are removed from the site.

Electrical, Process Mechanical, and Instrumentation

After the structures have been erected and roofed, electrical equipment (e.g., machinery control consoles, switchboards, lighting, etc.) would be installed. Site work such as installing pull boxes, conduits, and cables would continue. Process mechanical equipment (e.g., pumps, mixers, and chemical injection systems) would be installed and piped through the process facilities. Site work would continue as small diameter chemical piping would be routed throughout the site. After roofs on buildings and facilities are secured, flow meters, level probes, pressure meters, and other instrumentation such as process analyzers would be installed.

Architectural and Landscaping

During the architectural phase, several specialized crews would apply stucco finishes, tile and flooring, windows, paint, and wall fixtures.

Startup and Testing

This final phase of construction would involve City personnel (i.e., operators, maintenance crews, and instrumentation specialists) working with the equipment vendors to confirm operation of equipment at the SE SWTF. Under City supervision, the equipment vendors would startup and test the equipment on-site to guarantee that pumps, mixers, gauges, SCADA system, and other

operating equipment are functional and able to meet design standards. This phase of construction would not involve any heavy equipment.

Raw Water Diversion and Conveyance

As described above, the source of the raw water supply for the new SE SWTF would be from the Kings River, delivered via FID's Fresno Canal and the Mill Ditch (Conveyance Option 1) or through a new intake/diversion and raw water transmission pipeline located east of the SE SWTF along the Fresno Canal (Conveyance Option 2). Specific details of the intake and each conveyance option are provided below.

Conveyance Option 1

Under Conveyance Option 1, water would be conveyed to the SE SWTF from the Kings River via the Fresno Canal and Mill Ditch (Figure 3-4). Improvements to the existing Mill Canal will likely be required along certain sections to handle this increased flow. A new or modified check structure would be required just west of the intersection of Armstrong and Mill Ditch Canal, north of the location of the SE SWTF, to be able to divert flow into the turnout that feeds the SE SWTF influent pump station. The check structure would require modification to an existing weir, as necessary to facilitate conveyance of flows to the SE SWTF. The new pump station would be constructed on the site of the new SE SWTF with sufficient pressure head to operate the various treatment processes completely by gravity. The pump station would be sized to 80 MGD capacity and its electric pumps, housed in a closed structure. A schematic of the check structure/diversion weir and pump station conceptual site plan is shown in Figure 3-5.

To facilitate this conveyance option, several improvements would be required in the Fresno Canal, upstream of the Mill Ditch. In order to control existing seepage concerns, two stretches of the Fresno Canal (totaling approximately 0.8 miles) would be lined using non-reinforced gunite at locations between the canal head gates and approximately 3.5 miles downstream.

Dredging of the Fresno Canal would be needed to mitigate hydraulic constraints in two canal stretches between the canal head gates and approximately 6.1 miles downstream (totaling approximately 1.1 miles). It is conservatively estimated that a dredging depth of one foot would be required to increase canal flow capacity by approximately 150 cubic feet per second (cfs). This would produce approximately 10,000 cubic yards (CY) of dredging spoils over the 1.1 mile dredged length. Following current FID standard practice, dredged material would be spread out along the existing canal bank.

Lastly, levee improvements to portions of the canal would be required to facilitate the construction of a year round access road along the entire canal conveyance (18.5 miles) from the Fresno Canal head gates to the SE SWTF check structure/turnout on Mill Ditch. The access road would facilitate routine operation and maintenance (O&M) responsibilities including driving the length of the canal on a daily basis in order to identify potential threats to water quality. Removal of existing vegetation/debris along the length of the access road would be necessary. FID possesses easements along the length of the entire canal.

Ongoing maintenance of the canal and improvements would be performed by FID as needed to maintain the capacity to provide contracted water supplies to the City and to its agricultural clients (i.e., minor grading along canal banks to mitigate erosion, removal of accumulated debris, routine mechanical repair of gates and weirs, re-grading of canal access roads, etc.).

FID indicated that providing year-round operation of the canal—inspecting and servicing the canal on a daily basis including weekends and holidays—could require the addition of 1 to 2 full-time ditch tenders.

Construction Considerations

TABLE 3-4
CONVEYANCE OPTION 1 CONSTRUCTION DETAILS

Facility Type	Length (feet)	Length (miles)	Estimated Excavation Quantity (Cut & Fill) (cubic yards)	Construction Trips	Construction Duration
Intake/Diversion Structure	N/A	N/A	1,000	220	20 weeks
Canal All Weather Road	95,600	18.1	N/A	9200	68 weeks
Canal Dredge and Line	95,600	18.1	10,000	190-260	50 weeks
On-Site Storage	N/A	N/A	65,000	45-60	15 weeks

NOTES: Includes all Option 1 facilities including canal lining, dredging, and construction of access road. Does not include other improvements such as removal of tailwater pipes, pipe crossings, fencing, agricultural chemical/fuel containment, debris removal, etc.

Estimated ranges of construction vehicle traffic, cut and fill quantities, and construction duration for the main project elements of Conveyance Option 1 are provided in Table 3-4. Although FID possesses easements along the canal suitable for the year-round access road, additional temporary construction easements may be required in order to accommodate ingress/egress and staging of construction vehicles and equipment during construction.

Construction Equipment and Materials

Anticipated construction materials and equipment for the construction of Conveyance Option 1 is shown in Table 3-5 below. The actual equipment used during construction would be determined by the contractor and the construction schedule. Listed equipment includes all aspects of construction for facility construction and materials handling.

TABLE 3-5
CONVEYANCE OPTION 1 CONSTRUCTION ASSUMPTIONS

Infrastructure Component	Equipment and Manpower	Materials

Intake/Diversion Structure	• Manpower estimate: 500 hours
	• Equipment needed:
	  ○ One excavator
	  ○ Concrete hauling and mixing equipment
	  ○ Dump trucks for hauling/relocation of excavated material
	  ○ Pickups and construction support vehicles
		• 500 CY concrete
		• Two intake pipelines, one with a manual screen and the other with a mechanical screen
		• Automated weir

TABLE 3-5
CONVEYANCE OPTION 1 CONSTRUCTION ASSUMPTIONS

Infrastructure Component	Equipment and Manpower	Materials
Canal	• Manpower estimate: 31,000 man-hours over 400 days, or approximately 78 man-hours/workday • Equipment needed: o Two excavators: 75 days o Two scrapers: 75 days o Two bulldozers: 160 days o Multiple dump trucks for delivery of canal all weather road base: 160 days: o Multiple pickups and other construction support vehicles (240 days)	• 65,000 CY of excavation and berm construction for on-site storage • 15,000 CY ag base for all-weather canal access road • 95,000 sf of shotcrete liner for canal • 10,000 CY canal spoils from dredging (no off-haul, placed on site on canal bank exterior)

Conveyance Option 2

Proposed Diversion Structure

A proposed new diversion structure would be installed on the south bank of the Fresno Canal to the west of its intersection with E. Trimmer Springs Road, approximately 0.6 miles downstream of the canal head gates within existing FID easements (Figure 3-7). The proposed diversion structure would include the construction and operation of a passive gravity intake with a capacity of 80 mgd (124 cfs) that would include one manual and one mechanical screen. Since the conveyance would be gravity driven, no pumps would be required, and water would flow by gravity to the proposed conveyance pipeline described in more detail below. Operation frequency of the diversion structure would mirror that of the SE SWTF and would be controlled through the SCADA system at the facility. Standard lighting would be installed to provide for staff safety and to allow for performance of maintenance activities. Access to the diversion structure would be provided by a new access road to be constructed off of E. Trimmer Springs Road.

Conveyance Pipeline

Conveyance Option 2 includes construction of a new raw water pipeline to convey raw water to the SE SWTF from the new diversion. This new raw water pipeline is anticipated to be approximately a 72 to 78-inch diameter pipeline. The proposed 13 mile route (see Figure 3-4) would be installed within existing roadways or adjacent to roadways within existing Fresno County rights-of-way.

Pipeline appurtenances would include both blow off valves and air relief valves (ARVs) located strategically at high points along the pipeline alignment. The ARVs would be placed in underground vaults wherever it is feasible. The vaults would have a footprint approximately four feet by four feet square. Approximately three to five drain valves would be located strategically along the pipeline alignment at low points to allow for draining of the pipeline. The blow off valves would also be located in underground vaults. The vaults would have a footprint approximately four feet by four feet square.

Fresno County right-of-way (ROW) within E. Belmont Avenue is continuous and varies from 60 to 90 feet. Therefore, in order to minimize existing roadway and traffic impacts, trench top widths

would be kept to a minimum, approximately 8 to10 feet, using vertical trench walls with shoring where necessary. Temporary construction easements would be necessary in stretches of narrower ROW along Belmont Road, but all permanent improvements would lie within the public ROW and the need for acquisition of permanent ROW or easements along the pipeline alignment is not anticipated.

Construction Considerations

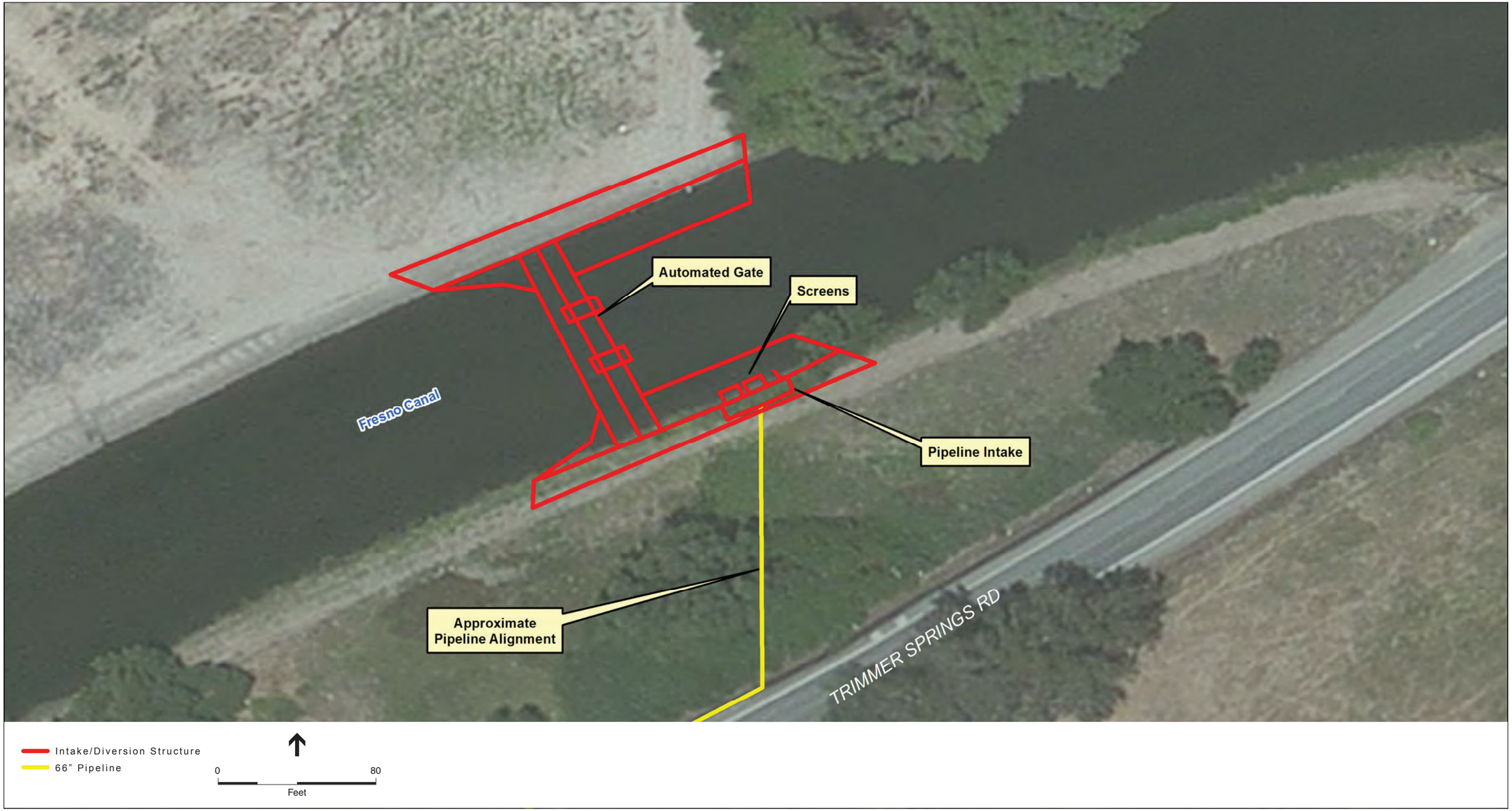
Conveyance Option 2 would involve of the installation of an approximately 72 or 78-inch diameter pipeline beginning near the Fresno Canal head gates to the proposed new SE SWTF. Installation of the pipeline would be accomplished primarily through trenching. Based on preliminary hydraulic design, the pipeline would be installed at a depth of approximately 14 feet. Trench width would be approximately 8 to 10 feet wide, with vertical walls and shoring installed per OSHA requirements. General pipeline construction methods, techniques, traffic controls, and staging assumptions are explained in more detail in below.

Construction Equipment and Materials

Anticipated construction materials and equipment for the construction of Conveyance Option 2 is shown in Tables 3-6 and 3-7. The actual equipment used during construction would be determined by the contractor and the construction schedule. Listed equipment includes all aspects of construction for facility construction and materials handling.

TABLE 3-6
CONVEYANCE OPTION 2 CONSTRUCTION DETAILS

Facility Type	Length (feet)	Length (miles)	Estimated Excavation Quantity (Cut and Fill) (cubic yards)	Construction Truck Trips	Construction Duration
Intake/Diversion Structure	n/a	n/a	1,000	220	20 weeks
72 to 78-inch diameter Pipeline	69,000	13.1	315,000	15,100	75 weeks



SOURCE: Carollo Engineers, 2013; ESA, 2013

Figure 3-7
Conveyance Option 2

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TABLE 3-7
CONVEYANCE OPTION 2 CONSTRUCTION ASSUMPTIONS

Infrastructure Component	Equipment and Manpower	Materials
Intake/diversion structure	• Manpower estimate: 500 hours • Equipment needed: o One excavator o Concrete hauling and mixing equipment o Dump trucks for hauling/relocation of excavated material o Pickups and construction support vehicles	• 500 CY concrete • Two intake pipelines, one with a manual screen and the other with a mechanical screen • Automated weir
Pipeline	• Manpower estimate: 35,000 man-hours over 450 days, or approximately 80 manhours/workday • Equipment needed: o Two excavators: 350 days o Crane/hoist for pipe loading/unloading and placement: 350 days o Multiple trucks for hauling pipe to/within job site: 350 days o Multiple dump trucks for hauling of trench spoils and delivery of bed fill and pavement materials: 390 days o Multiple pickups and other construction support vehicles (450 days) o Pavement cutter, grinder o Paving equipment	• 39,000 ft of 84” diameter raw water pipe (welded steel or reinforced concrete) • 30,000 ft of 66” diameter raw water pipe (welded steel or reinforced concrete) • 11,000 CY bed fill (granular or soil-cement slurry) • 3,000 CY aggregate road base to replace disturbed roadway • 1,000 CY A/C to replaced disturbed pavement

Operational Improvements and Expansion of the Existing NE SWTF

The City’s existing NE SWTF has a current operational capacity of 27.5 mgd and has some operational constraints which prevent it from being operated at its full design capacity of 30 mgd. Proposed improvements for this facility so that it could be operated at full design capacity include, but are not limited to: expansion of new floc/sedimentation basins and ozone systems, upgraded security measures including revision of perimeter fencing to a seven foot tall masonry block wall with a one foot tall Shepherds Hook above, hydropower generation unit, expanded storage facilities, increased clearwell storage capacity, re-rating of filter flow capacity, installation of a 100 foot communication tower, and installation of onsite emergency generators. In addition to improvements to achieve full design capacity, the Metro Plan Update proposes that this facility be expanded by 30 mgd to a total design capacity of 60 mgd and be operational in 2020. The main facilities required to accomplish this 30 mg expansion are construction of new floc/sedimentation basins and ozone system. This proposed expansion would provide the City with the capability to treat a total of 51,400 AFY for direct use from the NE SWTF based on an average treatment capacity of 50 mgd for 11 months of the year, consistent with the Metro Plan Update objectives previously described of maximizing the use of available surface water supplies to improve the reliability and diversity of the City’s water supply portfolio.

Construction Considerations

Proposed improvements to the NE SWTF would all be located within the existing facility site boundaries (see Figure 3-8). Construction vehicles and equipment would park on-site and all construction staging would occur on-site. Construction activities would be limited to the

portion of the existing site receiving upgrades. The following construction activities are expected to occur for the NE SWTF upgrades:

- Clearing and Grubbing
- Excavation and Site work
- Electrical, Process Mechanical, and Instrumentation
- Paving
- Architectural and Landscaping

These activities are expected to be required for construction of the new clearwell, the new single-story warehouse and storage facility and the new emergency generators.

Transmission System

A major north/south regional transmission system in Chestnut Avenue is proposed to connect the proposed SE SWTF and the NE SWTF. Other major transmission mains (24-inch diameter to 48-inch diameter) would be located in Behymer Avenue, North Maple Avenue, Nees Avenue, Olive Avenue, McKinley Avenue, North Avenue, G Street, Palm Avenue, Bullard Avenue, and Temperance Avenue, as shown on, as shown on Figure 3-3. A summary of the proposed regional transmission main system and transmission grid main (TGM) pipelines that would be needed to serve the 2025 SOI is presented in Table 3-8 and 3-9. Specific characteristics of the system include:

- No individual customer service taps on regional transmission system pipelines;
- Water to the TGM system would be provided from turnouts off the regional transmission system;
- The existing TGM system would be expanded and strengthened; and
- Water would be provided to the local distribution systems through a grid of 16-inch diameter TGM pipes.

TABLE 3-8
POTABLE WATER TRANSMISSION MAIN SUMMARY (THROUGH 2025)

Pipe Diameter, inches	Length, feet
48	12,900
42	59,100
36	47,100
30	39,200
24	107,500
16 (TGM)	506,200
Total	**772,000**

SOURCE: City of Fresno Metro Plan Phase 2, January 2011

SOURCE: ESRI, 2009; City of Fresno, 2009; West Yost, 2010; ESA, 2013

Figure 3-8
Proposed Project –
Northeast Surface Water Treatment Facility/
Improvement Projects

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TABLE 3-9
WATER TRANSMISSION PIPELINES (ALL)

Location (pipeline route)	Diameter Size	Crossings (roads, railroads, streams, etc.)
Regional transmission main in Olive Avenue, McKinley Avenue, and Walnut Avenue by 2014		
Olive Ave from Southeast-SWTF west to Minnewawa Ave	42"	Clovis Ave, Fowler Ave, Minnewawa Ave Private canal pipeline - Temperance #3
Olive Ave from Minnewawa Ave to Cedar Ave	36"	Peach Ave, Willow Ave, Chestnut Ave, Hwy 168, Maple Ave, Cedar Ave
Olive Ave from Cedar Ave to First St	30"	First St
First St from Olive Ave to McKinley Ave	30"	Floradora Ave, McKinley Ave FID - Dry Creek Thru Town
McKinley Ave from First St to Blackstone Ave	30"	Hwy 41, Blackstone Ave BNSF Railroad
McKinley Ave from Blackstone Ave to Walnut Ave	24"	Van Ness Ave, Palm Ave
Walnut Ave from McKinley Ave to H St	24"	Olive Ave, Belmont Ave FID - Dry Creek Thru Town
Regional transmission main in Chestnut Avenue by 2014		
Chestnut Ave from Ashlan Ave to Olive Ave	24"	Dakota Ave, Shields Ave, Clinton Ave, McKinley Ave FID - Gould Canal Pipeline, Mill Canal
Regional transmission main from SE SWTF east in Olive Avenue, South in Temperance Avenue, west in North Avenue, northwest in various alignments, and Connect to Downtown storage tank located near H Street and Santa Clara (southern loop) by 2014		
Olive Ave from SE SWTF east to Temperance Ave	48"	Armstrong Ave
Olive Ave from SE SWTF east to Temperance Ave	24"	Armstrong Ave
Temperance Ave from Olive Ave to Kings Canyon Rd	48"	Belmont Ave, Tulare St, Kings Canyon Rd FID - Eisen Canal, Fancher Creek Pipeline, Briggs Canal
Temperance Ave from Kings Canyon Rd to California Ave	42"	Butler Ave FID - Briggs Canal
Temperance Ave from California Ave to Jensen Ave	36"	Church Ave, Jensen Ave
Temperance Ave from Jensen Ave to North Ave	30"	North Ave FID - Briggs Canal
North Ave from Temperance Ave to Fowler Ave	30"	Armstrong Ave, Fowler Ave FID - Briggs Canal
North Ave from Fowler Ave to Frontage Rd/Railroad Ave, or potentially along Golden State Highway	24"	Clovis Ave, Minnewawa Ave, Peach Ave, Willow Ave, Chestnut Ave Union Pacific & BSNF Railroad FID - Washington Colony Canal, Central Canal
Frontage Rd/Railroad Ave or possibly Golden State Highway from North Ave to Tank Site 4	24"	Jensen Ave, Church Ave, Hamilton Ave, Hwy 41 FID - Braly Pipeline
Ventura St from H St to O St	24"	Van Ness Ave, M St
Regional transmission main from NE SWTF to Olive Avenue by 2020		
Behymer Ave from NE SWTF to Maple Ave	42"	Chestnut Ave, Maple Ave FID - Enterprise pipeline
Maple Ave from Behymer Ave to Nees Ave	42"	Perrin Ave, Shepherd Ave, Teague Ave, Nees Ave FID Enterprise Pipeline
Nees Ave from Maple Ave to Palm Ave	42"	Cedar Ave, Milbrook Ave, First St, Fresno St, Hwy 41, Blackstone Ave, Ingram Ave FID - Forkner Pipeline, Enterprise Pipeline Private - Knapp Pipeline

TABLE 3-9
WATER TRANSMISSION PIPELINES (ALL)

Location (pipeline route)	Diameter Size	Crossings (roads, railroads, streams, etc.)
Palm Ave from Nees to Shaw Ave	42"	Nees Ave, Alluvial Ave, Herndon Ave, Sierra Ave, Bullard Ave, Barstow Ave, Shaw Ave FID, Bullard Pipeline, Forkner Canal, Enterprise-Holland Pipeline, B-Main Pipeline
Palm Ave from Shaw Ave to McKinley Ave	36"	Gettysburg Ave, Ashlan Ave, Dakota Ave, Shields Ave, Clinton Ave, McKinley Ave Burlington Northern Santa Fe Railroad FID - Herndon Canal
Bullard Ave from Palm Ave to West Ave	24"	Palm Ave, Fruit Ave, West Ave FID - B-Main Pipeline
Nielsen Ave from Hughes Ave to Marks Ave	24"	Marks Ave, Hughes Ave
Olive Ave from Temperance Ave to Dewolf Ave	24"	Temperance Ave
Northerly crossing beneath Highway 99 and railroad by 2020.		
McKinley Ave from Palm Ave to Marks Ave	30"	Palm Ave, Fruit Ave, West Ave, Hwy 99 Union Pacific Railroad FID - Cole S. Branch Pipeline, Cole W. Branch Canal
McKinley Ave from Marks Ave to Brawley Ave	24"	Valentine Ave, Brawley Ave, Marks Ave FID - Victoria Colony E. Branch Pipeline, Victoria Colony W. Branch Canal

Distribution Pipelines

Water would be provided to the local distribution systems through a grid of 12-inch and 16-inch diameter transmission pipes. As shown on Figure 3-3, there would be about 96 miles of new 16-inch transmission grid distribution pipelines constructed to provide water for local use. Pipelines sized 12-inch diameter and less would be installed for actual distribution of treated water to individual businesses and residential areas.

Pipeline Operation and Maintenance

Once the project transmission and distribution pipelines are built, operation would be monitored by the City's SCADA system, controlled from the SE SWTF or NE SWTF. No permanent employees or daily worker trips would be required to operate the pipeline system; however, periodic inspection and maintenance would be conducted as needed.

Pipeline Construction Considerations

Raw and treated water transmission and conveyance facilities would be constructed and installed throughout the Metro Plan Update project area (shown on Figure 3-3) and phased over a number of years (see Table 3-10). Construction methods and schedules depend upon local conditions, therefore construction of each facility differs between methods used in suburban and rural-residential roadways and construction techniques for constrained areas (e.g.- downtown Fresno) areas and major infrastructure crossings (e.g. highway, arterial intersection and railroad crossings).

TABLE 3-10
RAW AND TREATED WATER CONVEYANCE FACILITIES CONSTRUCTION DETAILS

Pipeline Classification	Pipeline Diameter	Length (feet)	Length (miles)	Estimated Max Trench Width (feet)	Estimated Max Trench Depth (assumes 5 feet of cover) (feet)	Estimated Excavation Quantity (Cut and Fill) (cubic yards)
Regional Transmission Mains	48	12,900	2.4	9.5	9	40,850
	42	59,100	11.2	8	8.5	148,844
	36	47,100	8.9	8	8	111,644
	30	39,200	7.4	6	7.5	65,333
	24	107,500	20.4	5	7	139,352
	Totals	265,800	50.3	-	-	506,023
Transmission Grid Mains	16	506,200	95.6	n/a	n/a	593,691
	Totals	506,200	95.6	n/a	n/a	593,691
	TOTALS	**772,000**	**145.9**			**1,099,714**

Except for crossings at interchanges or streams, facilities would be constructed within existing street rights of way and would be installed using open cut trenching. Where minor ditch crossings (less than 15 feet in width) are required, the ditches would most likely be temporarily dammed prior to open cut trenching or trenching scheduled to coincide with periods when these ditches are not conveying any water. In areas where open cut trenching is not possible due to limited construction area, geotechnical conditions, or environmentally sensitive areas (i.e.- stream crossings), trenchless construction techniques (e.g., jack and bore, horizontal directional drilling, or micro tunneling) would be employed.

Open Trench Installation

In most areas, the pipeline would be installed in open trenches, using conventional cut and cover construction techniques. Typical pipeline construction would consist of trench excavation, pipe installation, and backfill operations. For pipeline construction in special locations (i.e.- known high groundwater locations), dewatering would be necessary prior to trench excavation. Construction would be confined within a maximum 40-foot wide construction corridor. In street rights of way, the pipeline would be buried deeper than 5 feet to avoid potential conflicts with existing and future adjacent utilities, which are usually buried from 3.5 to 5 feet.

The width and depth of the trench would vary, depending on the location along the route and the diameter of the pipeline. The estimated trench width for all project facilities would be between 7 to 10 feet wide. Approximately 1.3 million CY of material would be excavated for the all raw and treated water transmission/conveyance facilities. In areas that contain shallow groundwater, dewatering activities would be required. Groundwater encountered during construction that cannot be contained on-site would be pumped into multiple Baker tanks or approved equivalent with either a filter or gel coagulant system or other containment to remove sediment. The remaining water would then be discharged to irrigation ditches, if located near the construction area.

Discharges would comply with the Central Valley Regional Water Quality Control Board's requirements for discharges from general construction activity and trench dewatering.

During construction, vertical wall trenches would be temporarily closed at the end of each work day, either by covering with steel trench plates, backfill material, or installing barricades to restrict access depending on the conditions of the encroachment permit. A temporary patch would be used until final repaving of the affected area occurs, about two to six weeks after pipeline installation is complete within a given road segment.

The final phase of pipeline construction would be surface restoration. In areas where pipe is installed within or along roadways, repaving would be the final step. Where temporary patching was done, permanent repaving would be the final step. Final repaving would be done at one time, after the entire pipe installation was completed or after pipe installation was completed for a particular reach of pipeline. Unpaved surfaces would be restored by replanting grasses, shrubs, and trees. A minimum 40-foot permanent right-of-way would be needed for the pipelines in areas outside of the roadways.

Trenchless Construction

The trenchless construction techniques that would be considered are bore and jack, micro tunneling, and horizontal directional drilling. These trenchless techniques would be utilized for installing underground pipelines without disturbing the ground surface and where open trenches are not acceptable or practical. Trenchless construction is anticipated to occur at all major street and railroad crossings listed on Table 3-8. Bore and jack employs an augur or hand excavation to remove material ahead of the pipe, while micro tunneling uses a laser guided and remotely controlled Micro tunnel Boring Machine. For both techniques, powerful hydraulic jacks are used to push pipe from a launch (bore) pit to a receiving pit. As the tunneling machine is driven foreword, a jacking pipe is added into the pipe string. Installation of a pipeline by horizontal directional drilling would be accomplished in two stages: (1) a small diameter pilot hole would be directionally drilled along a designed directional path; and (2) the pilot hole would be enlarged to a diameter that would accommodate the pipeline and the pipeline would be pulled back into the enlarged hole.

Slurry, typically bentonite (an inert clay), would be used as a drilling lubricant, and would be processed by separating solids from the slurry and discharging the clear liquid to waterways or storm drains. Groundwater levels in micro tunneled areas would be identified prior to construction to determine the extent of dewatering required at tunnel pits. Dewatering of launching and receiving pits could require groundwater pumping, which would be discharged on-site and/or discharged to the sanitary sewer, or alternatively discharged to waterways or storm drains. Dewatering and slurry waste discharges would comply with the Central Valley Regional Water Quality Control Board's (CVRWQCB) requirements for discharges from general construction activity and trench dewatering.

Right of Way and Construction Easement Widths

The City intends to construct all pipelines within existing road ROW; however there is the possibility that alignments could be modified prior to final design. For the various sized pipelines constructed in areas outside of the roadways, a minimum construction easement 40-foot and maximum easement of 100 feet of permanent ROW would be required.

Pipeline Construction Rates

Pipeline installation would occur at a rate of 300 to 400 feet per day in locations where the water pipelines would cross open land or use low-use sections of roadways. In more developed areas of Fresno, where there are narrow construction corridors, higher traffic volumes, and more utilities, the installation rate is expected to average approximately 200 feet per day. In downtown Fresno or other constrained areas of pipeline construction, the approximate rate of construction can be as low as 80 feet per day.

Assuming these rates of construction, it is anticipated that construction of Priority 2 and Priority 3 transmission mains (shown on Figure 3-3) would take approximately 53 months.

Excavation Spoils

In areas with sufficient right of way available, excavated soil would be sidecast then returned to cover each pipeline section after its installation. In constrained areas, excavated soil would be hauled to a suitable temporary storage area until it is returned to the construction site. Stored soil would be protected from wind and rain erosion, sedimentation, and runoff. Soil in excess of backfill requirements would be hauled to a suitable disposal area or made available for other uses.

Pipeline Staging Areas

At various locations within the pipeline construction zones, staging areas would be required to store pipe, construction equipment, and other construction related items. Staging areas would be established in areas near construction zones that are open and easily accessed (i.e., vacant lots). In some cases, staging areas could be used for the duration of the project. In other cases, as pipeline construction moves along the route, the staging area could also be moved to minimize hauling distances and avoid disrupting any one area for extended periods of time. The City would require contractors to negotiate short-term temporary easements for staging areas. The location of the staging areas would be determined by the contractor, with direction from the City, and would typically be located every five miles along the pipeline alignment. The maximum size of these staging areas would be five acres. Additional staging areas would be located within the up to 100-foot construction corridor along the pipeline alignment. Two staging areas would be required along the pipeline alignment for storing equipment and materials, and a construction office trailer. Trenchless construction would occur in parallel with the activities above.

Traffic Control

Although major portions of the pipeline are anticipated to be installed along existing roadways, complete road closures during construction activities are not anticipated. Flagging and other forms of temporary traffic control, such as re-directing lanes with cones and signage, may be necessary at intersections where the pipeline alignment lies under an existing road or to allow for delivery or placement of equipment, pipe sections, or other materials. A detailed traffic control plan would be developed by the contractor and submitted to the City of Fresno and/or the County of Fresno for approval prior to commencement of construction. The contractor would follow the standard practice of metal plating open trenches or disturbed pavement areas until trenches are backfilled and/or new pavement can be installed. In any given area along the pipeline alignment, minimal temporary staging areas for materials and equipment may be established for two to four weeks while work is being completed in that particular area.

3.4.3 Future Project Elements

Proposed future elements for the Metro Plan Update are summarized in Table 3-11 below. These elements are analyzed at a program level in the EIR and will require additional environmental analysis and documentation prior to construction and operation in order to be in compliance with CEQA. The future elements of the proposed Metro Plan Update include improvements proposed as part of the City of Fresno Recycled Water Master Plan that was adopted by the City in April 2013. The Metro Plan EIR will not re-analyze the construction and operation of these specific recycled water facilities because they were analyzed in the certified Recycled Water Master Plan EIR (SCH# 2010051015). The Recycled Water Master Plan EIR is on file and can be reviewed at the City of Fresno Wastewater Management Division offices located at the Fresno-Clovis Regional Water Reclamation Facility, 5607 West Jensen Avenue, Fresno, California, 93706.

TABLE 3-11
FUTURE PROJECT ELEMENTS

Infrastructure Component	Description
Surface Water Treatment Facilities	Future SW SWTF • 10 to 20 mgd
Potable Water Regional Transmission Facilities	• New potable water transmission and distribution system pipelines to distribute water supplies to customers
Potable Water Storage Facilities	New potable water storage facilities located at key locations in the City to provide operational flexibility during peak demand periods and provide emergency storage capacity • • New Eastside Tank "T5" (assumed to be 4 million gallons) (possibly near Chestnut Avenue and Ashlan Avenue) • New Westside Tank "T6" (assumed to be 4 million gallons) (near Highway 99 at Ashlan Avenue)
Groundwater Facilities	• 65 new wells by 2025 • Groundwater treatment systems on new wells as needed to address organic and inorganic water quality contaminants, as well as potential upcoming State and Federal regulations • Expanded existing groundwater recharge basins and/or new groundwater recharge basins/areas (340 acres of additional recharge area; 425 acres total including roadways and setbacks) to increase intentional groundwater recharge capabilities, particularly in years when surplus surface water supplies are available for recharge • Potential Aquifer Storage and Recovery (ASR) System for groundwater injection and extraction in lieu of or in addition to new recharge basins
Recycled Water Facilities (City of Fresno Recycled Water Master Plan)	• Improvements to the existing RWRF and construction of satellite and/or stand-alone Wastewater Treatment Plants (WWTP) to produce tertiary treated recycled water for non-potable uses including landscape irrigation to offset potable water demands [a] • Recycled water storage facilities to serve peak demands [a] • Extensive new recycled water transmission and distribution system pipelines to distribute recycled water supplies from the RWRF/WWTPs to customers [a]
Water Conservation [b]	• Implement a tiered water rate structure as soon as possible to further encourage water conservation; • Require new development to offset a portion of their required supply needs by implementing conservation measures (anticipated to provide a five percent demand reduction); • Establish aggressive water conservation goals/policies for new construction; • Establish more efficient exterior water use goals/policies for existing users including water conservation measures specifically geared towards reducing water use for landscape and turf irrigation; • Provide additional staff and program-specific financial resources required to implement and manage conservation programs (e.g., grant writer, CII conservation representative); • Maintain compliance with CVP Contract including the Best Management Practices

TABLE 3-11
FUTURE PROJECT ELEMENTS

Infrastructure Component	Description
	requirements; and • Update the City's Urban Water Management Plan every five years per State requirements.

a. These facilities have undergone environmental review and will not be evaluated in the Metro Plan Update EIR.
b. No physical facilities associated with water conservation measures

3.5 Schedule

The estimated implementation schedule for both near-term and future projects of the proposed Metro Plan Update is shown in Table 3-12. The timing of the individual infrastructure components of the Metro Plan Update will ultimately depend on the need for additional water supply capacity and the availability of funding.

TABLE 3-12
PROPOSED SCHEDULE FOR IMPLEMENTATION OF THE METRO PLAN UPDATE

Infrastructure Component	Construction Period
Surface Water Treatment Facilities	• 2015-2018: 80 mgd SE SWTF • About 2020: Expanded (60 mgd) NE SWTF • About 2025: New SW SWTF
Potable Water Transmission Facilities	• 2014-2018: Regional Transmission Main pipelines to convey treated water from new SE SWTF • Regional Transmission Grid Main pipelines to distribute treated water from expanded NE SWTF • About 2020 -2025: Transmission Main pipelines to distribute treated water from new SW SWTF
Potable Water Storage Facilities	• 2015-2025
Groundwater Facilities	• 2014-2025: New wells, wellhead treatment, groundwater storage/recharge facilities
Recycled Water Facilities (Recycled Water Master Plan)	• 2015-2025: Recycled water treatment and distribution facilities (treatment and distribution)
Water Conservation	• 2014-2025: Implement additional water conservation measures to reduce water use

3.6 Regulatory Requirements, Permits and Approvals

In addition to meeting CEQA requirements, proposed project(s) would be required to obtain federal, state and local permits and regulatory approvals. It is possible that construction projects to be implemented as part of the Metro Plan Update could require, depending upon the environmental resources identified on or near project sites and water pipeline alignments, authorization from the following agencies:

- Federal –U.S. Army Corps of Engineers (wetlands), U.S. Fish and Wildlife Service (terrestrial species), and National Marine Fisheries Service (aquatic species), Federal Aviation Administration (airport land use compatibility)
- State –Central Valley Regional Water Quality Control Board (water quality certificate, waste discharge requirements), California Department of Fish and Wildlife (streambed alteration permit), Central Valley Flood Protection Board (floodplains), California

Department of Transportation (highway crossings), California Department of Conservation (important farmlands), California Department of Public Health, San Joaquin Valley Unified Air Pollution Control District, and potentially the California Native American Heritage Commission and the State Office of Historic Preservation

- Local – City would work cooperatively with Fresno County and special districts on required permitting issues
- City of Fresno – entitlements, such as a Conditional Use Permit, for water facilities

Additional approvals for project construction and operation would also be required for implementation of all the project alternatives. The approvals listed below are considered distinct from permits because they are not required by resource agencies for protection of natural and cultural resources. Examples of approvals, possibly using eminent domain for purchase of land or easements, that would need to be negotiated include:

- Temporary construction easements along and across local roadways – public and private property owners along pipeline alignments
- Temporary right-of-way borings – California Department of Transportation, Union Pacific Railroad company, Fresno County
- Operational agreements – Fresno Irrigation District and Fresno Metropolitan Flood Control District
- Acquisition of land and utility rights-of-way through purchase or condemnation, if necessary

The agencies and organizations responsible for issuing project approvals would consider the information presented in the EIR during their deliberations.

CHAPTER 4
Environmental Setting, Impacts and Mitigation Measures

4.1 Introduction

4.1.1 Scope of the EIR

Chapter 4 presents the environmental and regulatory setting, impacts and mitigation measures for the technical issue areas (4.2 through 4.12). Based on the NOP and scoping comments received, the following environmental issues areas are addressed in the Program EIR:

4.2 Land Use and Agricultural Resources
4.3 Geology and Soils
4.4 Hydrology and Water Quality
4.5 Biological Resources
4.6 Transportation
4.7 Air Quality and Climate Change
4.8 Noise
4.9 Hazards and Hazardous Materials
4.10 Public Services and Utilities
4.11 Aesthetics
4.12 Cultural Resources

4.1.2 Section Format

Each section contains: (1) environmental and regulatory settings; (2) standards of significance; (3) method of analysis; and (4) project-specific and cumulative impacts with recommended mitigation measures. The physical and regulatory setting provides a point of reference for assessing the environmental impacts of the proposed project. The setting discussion is followed by an impacts and mitigation discussion. Preceding each impact and mitigation measure discussion is a summary table that lists the impacts identified and the significance conclusion with implementation of mitigation measures for near-term and future project elements. Where no impact would occur after consideration of the standard of significance, a discussion is provided that supports that conclusion.

4.1.3 Impacts and Mitigation Measures

Each impact discussion includes an impact statement (in bold text), an explanation of the impact (as it relates to the proposed project), an analysis of the significance of the impact, identification of relevant mitigation measures, if appropriate, and an evaluation of whether the recommended mitigation measures would reduce the magnitude of identified impacts. Each impact statement is assigned a number based on the section and the order they appear (for example, 4.2.1, 4.2.2, etc).

As described in Chapter 1, this EIR evaluates near-term project elements at a project level and future project elements at a program level. If the impact analysis would be the same regardless of the project facility or option then the discussion is prefaced by the following header:

- **Near-Term and Future Project Elements**

If there are differences between the elements, the discussion will be prefaced by the following headers:

- **Near-Term Project Elements**
- **Future Project Elements**
- **Summary**

In cases where the impact discussion is separated, then a summary of the conclusions is presented and a common finding of significance is provided.

In order to understand what mitigation measures apply to which project elements the following designations are used:

- **Near-Term Project Elements (NT)**
- **Future Project Elements (F)**

4.1.4 Terminology

This Draft EIR uses the following terminology to describe environmental effects of the proposed project in Chapter 4:

- **Standards of Significance**: A set of criteria used by the lead agency to determine at what level or "threshold" an impact would be considered significant. Standards of Significance used in this EIR are based on Appendix G of the CEQA Guidelines. In determining the level of significance, the analysis assumes that the proposed project would comply with relevant federal, State, and local regulations and ordinances.
- **Less than Significant Impact**: A project impact is considered less than significant when it does not reach the standard of significance and would therefore cause no substantial change in the environment (no mitigation required).
- **Significant Impact**: A project impact is considered significant if it would result in a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of project effects in the context of specified

significance criteria. Mitigation measures and/or project alternatives are identified to reduce these effects to the environment where feasible.

- **Significant and Unavoidable Impact**: A project impact is considered significant and unavoidable if it would result in a substantial adverse change in the environment that cannot be feasibly avoided or mitigated to a less-than-significant level if the project is implemented. Findings of Fact and a Statement of Overriding Considerations must be adopted if impacts cannot be mitigated.
- **Cumulative Impacts**: According to CEQA, "cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (*CEQA Guidelines*, section 15355). CEQA requires that cumulative impacts be discussed when the "project's incremental effect is cumulatively considerable" (*CEQA Guidelines*, section 15130 (a)).
- **Mitigation Measures**: The *CEQA Guidelines* (section 15370) define mitigation as:

    1. Avoiding the impact altogether by not taking a certain action or parts of an action;
    2. Minimizing impacts by limiting the degree of magnitude of the action and its implementation;
    3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
    4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
    5. Compensating for the impact by replacing or providing substitute resources or environments.

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4.2 Land Use and Agricultural Resources

This section evaluates consistency of the proposed project with existing and future land uses. The City is in process of updating the General Plan (2035 General Plan Update). The project area for the proposed Metro Plan Update includes the existing city limits and the City of Fresno SOI designated by the adopted 2025 General Plan. The boundaries designated by the proposed 2035 General Plan Update are consistent with those adopted in the 2025 General Plan; therefore, the proposed project area would not change. Because the City is in the process of updating its general plan, the EIR analyzes the project with regard to the adopted general plan in effect at the time of consideration of certification of the EIR.

This section of the EIR also addresses potential impacts associated with agricultural resources, specifically the permanent conversion of important farmland to non-agricultural uses and potential conflicts with zoning for agricultural land.

Comments addressing land use and agricultural resources received in response to the NOP address potential conversion of agricultural land to accommodate proposed groundwater recharge facilities and the potential for growth inducement. Growth inducement is addressed in Chapter 5. See Appendix B for NOP comment letters.

4.2.1 Environmental Setting

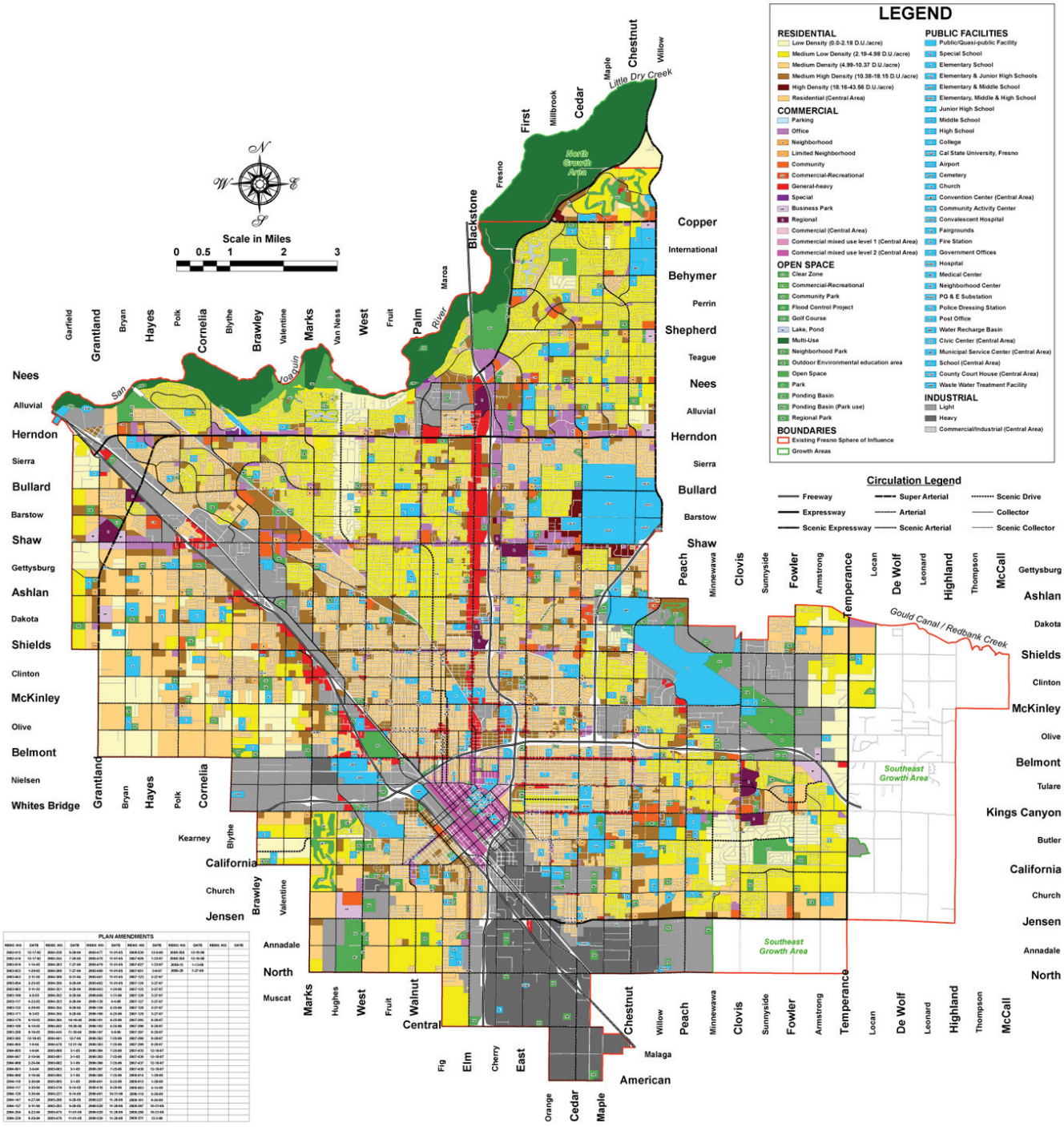
Regional Overview

The City of Fresno is located in Fresno County and in the San Joaquin Valley. The San Joaquin Valley is the southern portion of the Great Central Valley of California. Geographically, the San Joaquin Valley is long and relatively narrow, stretching from the Tehachapi Mountains in the south to the San Joaquin Delta in the north, a distance of nearly 300 miles. The eastern boundary of Fresno County is the Sierra Nevada, which reach elevations of over 14,000 feet, while the western boundary of the County is the lower coastal ranges. Total land area of the San Joaquin Valley is approximately 23,720 square miles.

The City is located in northern Fresno County and primarily east of State Route 99 approximately 170 miles south of the City of Sacramento, and 220 miles northeast of the City of Los Angeles (see Figure 3-1). The Fresno-Clovis metropolitan area, with a current population of 1,002,046, is the second largest metropolitan area in the Central Valley after Sacramento. The City is the county seat of Fresno County, the fifth largest city in California, and currently encompasses 110 square miles in geographic area.

Proposed Project Area

As shown in the land use and zoning diagrams for the project area (Figure 4.2-1) the City of Fresno 2025 General Plan includes land use designations for the areas within the City limits and its SOI. Some of the land use designations were changed with the release of the 2025 General Plan, including the parcels where the NE SWTF and SE SWTF would be sited. The NE SWTF



SOURCE: City of Fresno, 2009; ESA, 2013

Figure 4.2-1

Land Use and Zoning Diagrams for the Project Area

had an existing land use designation of open space/agriculture and was changed to a planned land use of water recharge basin – a subset of the public facility designation. The SE SWTF had an existing land use designation of open space/agriculture and was changed to light industrial. The proposed SE SWTF site is located on undeveloped fallow farmland. Adjacent uses include rural residential housing, an elementary school, a golf course, as well as farmland and other open space areas. Conveyance Options 1 and 2 alignments are located primarily within the unincorporated area of Fresno County on or adjacent to land designated AE 20, exclusive agriculture. The remainder of both near-term and future project elements, including conveyance pipelines, storage tanks, ground water wells, and groundwater recharge basins would be located within the urban core of the City of Fresno on or adjacent to a variety of land use classifications including residential, commercial, open space, industrial, and public facilities.

Agricultural Resources

The San Joaquin Valley, including the Fresno area, is well known for agricultural production. Nearly ideal growing conditions, reservoirs, and water distribution projects, such as the federal CVP and the State Water Project (SWP) have resulted in seven of the top ten agricultural counties in the nation being in the San Joaquin Valley (Fresno, Tulare, Kern, Merced, Stanislaus, San Joaquin and Kings Counties).

To characterize agricultural resources in Fresno County, Important Farmland Maps (Draft 2010 Series) produced by the Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) were reviewed. Important Farmland maps show categories of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance (if adopted by the county), Grazing Land, Urban and Built-up Land, Other Land, and Water. Prime Farmland and Farmland of Statewide Importance map categories are based on qualifying soil types, as determined by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), as well as current land use (irrigated agriculture). These map categories are defined by the Department of Conservation's FMMP as follows:

- ***Prime Farmland:*** 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.
- ***Farmland of Statewide Importance:*** Farmland similar to 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.
- ***Unique Farmland:*** Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.
- ***Farmland of Local Importance:*** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

- ***Grazing Land:*** Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres. Due to variations in soil quality, smaller units of Grazing Land may appear within larger irrigated pastures.
- ***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.
- ***Other Land:*** Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.
- ***Water:*** Perennial water bodies with an extent of at least 40 acres.

Table 4.2-1 shows the acres of farmland in Fresno County, as well as the amount of farmland conversions using the most recent data available from the California Department of Conservation farmland monitoring program. The majority of lands in the City of Fresno are classified as urban. Even though the majority of land outside the city limits within the SOI has been planned for urban uses, there are lands designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. There are also lands classified as Williamson Act Contract; however, the majority of these lands are in non-renewal status.

TABLE 4.2-1
FARMLAND CONVERSION FROM 2008–2010 IN FRESNO COUNTY

	Total Acres Inventoried		2008–2010 Acreage Changes		
Land Use Category	2008	2010	Acres Lost	Acres Gained	Net Change
Prime Farmland	693,174	685,411	11,052	3,289	-7,763
Farmland of Statewide Importance	439,020	415,689	24,776	1,445	-23,331
Unique Farmland	94,177	92,649	2,065	537	-1,528
Farmland of Local Importance	149,907	176,524	7,963	34,580	26,617
Grazing Land	826,953	825,752	1,423	222	-7,206
Agricultural Land Subtotal	**2,203,231**	**2,196,025**	**47,279**	**40,073**	**-7,206**

SOURCE: California Department of Conservation (Table A-7) (2010)

4.2.2 Regulatory Setting

State

California Land Conservation Act (Williamson Act)

Under the provisions of the Williamson Act (Section 51200 of the California Land Conservation Act of 1965), landowners contract with the County to maintain agricultural or open space use of

their lands in return for a reduced property tax assessment. In 1994, the Williamson Act was amended to include specific language regarding "conditional compatibility" (Government Code Section 51238.1), mining compatibility (Section 51238.2) and grandfather provisions (Section 51238.3). Approximately 1.5 million acres are currently under contract in Fresno County (Fresno County Farm Bureau, 2009). Williamson Act land is located throughout Fresno County's agricultural regions, generally some distance from the urban centers. As previously noted, the majority of lands classified as Williamson Act Contract in the City's SOI are in non-renewal status, including the proposed SE SWTF site.

California Farmland Mapping and Monitoring Program

The California Department of Conservation, under the Division of Land Resource Protection, has set up the FMMP. The FMMP monitors the conversion of the state's farmland to and from agricultural use. The map series identifies eight classifications and uses a minimum mapping unit size of 10 acres. The FMMP also produces a biannual report on the amount of land converted from agricultural to non-agricultural uses within each county (see Table 4.2-1). The FMMP maintains an inventory of state agricultural land and conducts updates of its "Important Farmland Series Maps" every two years.

The FMMP is an informational service only and does not have regulatory jurisdiction over local land use decisions. Three categories of farmland (Prime Farmland, Farmland of Statewide Importance, and Unique Farmland) are considered valuable and any conversion of land within these categories is typically considered to be an adverse impact.

California Code Section 53091

California Government Code section 53091 provides guidelines for compliance with applicable building and zoning ordinances of counties and cities, and provisions for rendering a city or county zoning ordinance inapplicable to certain proposed uses. Specifically, section 53091(d) et seq. directs that both building ordinances and zoning ordinances of cities and counties do not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water or wastewater by a local agency. According to case law, these provisions also apply to general plans.

Local

Although facilities for the production, generation, storage, treatment, or transmission of water are not required to comply with local land use plans such as county and city General Plans, as discussed above, the following text describes relevant local plans and policies. This discussion is provided to allow assessment of whether the proposed project would conflict with plans and policies adopted for the purpose of avoiding or mitigating an environmental effect.

2025 Fresno General Plan Update

The City of Fresno 2025 General Plan Urban Form Element, Open Space / Recreation Element, and Resource Conservation Element contain multiple objectives and policies relevant to land use, land use planning and agriculture within the project area (City of Fresno, 2002).

Objective C-14 The city will support establishment of public facilities and institutions to meet needs for services and administration in a manner consistent with general plan policies and provision of adequate access and utility services.

Policy C-14a These facilities will be sited and developed in a manner which protects the integrity of surrounding neighborhoods.

Policy C-14c Public facilities land uses shall be permitted to be developed in all zone districts pursuant to the provisions noted in Table 2 (of the General Plan). In the comprehensive update of the zoning ordinance, the classification, the development standards, and review / approval process for the range of public facilities shall be reevaluated.

Policy C-14d For public facilities and institutions being located in Fresno's Sphere of Influence, when such facilities are beyond the city's land use or zoning authority, the city shall negotiate with the responsible public agency to make improvements which will timely meet city standards for public street improvements, access, parking, water supply, wastewater disposal, landscaping, and other services and amenities.

Objective F-2 Ensure that adequate land, in appropriate locations, is designated and acquired for park and recreation uses prior to urban development.

Policy F-2b The city will ensure that the Parks and Planning and Development Departments coordinate their review and approval of all development entitlements (i.e., site plans, conditional use permits, and subdivisions) in order to implant open space standards.

Objective G-5 While recognizing that the County of Fresno retains the primary responsibility for agricultural land use policies and the protection and advancement of farming operations, the City of Fresno will support efforts to preserve agricultural land outside of the area planned for urbanization and outside of the city's public service delivery capacity by being responsible in its land use plans, public service delivery plans, and development policies.

Policy G-5b Plan for the location and intensity of urban development in a manner that efficiently utilizes land area located within the planned urban boundary, including the North and Southeast Growth Areas, while promoting compatibility with agricultural uses located outside of the planned urban area.

Objective G-6 Support existing farming operations and protect them from untimely urbanization.

Policy G-6a Allow for continued agricultural use of vacant land in the city consistent with standards for the protection of the environment, public safety and well-being, and the planned, orderly, and efficient development of the urban area.

Policy G-6b The City of Fresno shall continue to recognize its agricultural preserve contracts (i.e., Williamson Act contracts) and shall promote the enrollment of all prime farmland that remains outside of its anticipated urban growth area. Scenic or resource conservation easements should be explored as another means for protecting farmland.

Policy G-6c Where possible, major streets will be utilized as boundaries between areas designated for urban development and agriculture.

Policy G-6d When land proposed for urban development directly abuts actively farmed land that is under an agricultural preservation contract which has not had an application for cancellation filed, nor a Notice of Nonrenewal, appropriate design features need to be incorporated into the development project to buffer the agricultural / urban interface. Design features should include the following, or equivalent measures, to create an adequate buffer:

- wider building setbacks with fencing.
- designated open space (including but not limited to: densely landscaped strips, full-width multi-use trails or bikeways, on-site flood control, drainage or recharge facilities) and / or boundary streets.

Objective G-12. To provide for long-term preservation, enhancement, and enjoyment of plant, wildlife, and aquatic habitat resources in the Fresno area by protecting, improving, and restoring these resources.

Policies G-12-a through G-12-l are specific policies designed to support Goal 11 and Objective G-12. Below are policies that are relevant to the proposed project:

G-12-d Policy Projects that could adversely affect rare, threatened, or endangered wildlife and vegetative species (or may have impacts on wildlife, fish, and vegetation restoration programs) may be approved only when findings are made by the California Department of Fish and Game (and the U.S. Fish and Wildlife Service, as appropriate) that adequate mitigation measures are incorporated in the project's design.

G-12-e Policy Open Space land use designations, appropriate zoning, setbacks, and conservation easements will be used to preserve areas identified as sensitive or critical habitat for rare, threatened, or endangered vegetation and wildlife species, with particular attention paid to the North and Southeast Growth Areas and to the preparation of the required community and/or specific plans for these expansion areas of the proposed 2025 Fresno General Plan.

Fresno County 2000 General Plan

The County of Fresno 2000 General Plan Agriculture and Land Use Element contains goals and policies relevant to land use, land use planning and agriculture within the project area.

Goal LU-A.1 To promote the long-term conservation of productive and potentially productive agricultural lands and to accommodate agricultural-support services and agriculturally-related activities that support the viability of agriculture and further the County's economic development goals.

Policy LU-A.1 The County shall maintain agriculturally designated areas for agriculture use and shall direct urban growth away from valuable agricultural lands to cities, unincorporated communities, and other areas planned for such development where public facilities and infrastructure are planned for and/or available**.**

Policy LU-A.13 The County shall ensure that the review of discretionary permits includes an assessment of the conversion of productive agricultural land and that mitigation be required where appropriate.

Goal LU-G To direct urban development within city spheres of influence to existing incorporated cities and to ensure that all development in city fringe areas is well planned and adequately served by necessary public facilities and infrastructure.

Policy LU-G.2 Fresno County shall work cooperatively with all cities of the county to encourage each city to adopt and maintain its respective plan consistent with the Fresno County General Plan. The County shall adopt complementary planning policies through a cooperative planning process to be determined by the respective legislative bodies.

4.2.2 Impacts and Mitigation Measures

Methods of Analysis

The land use planning analysis presented below evaluates the consistency of the proposed project with the type and intensities of the existing and planned land uses in the project area. Potential land use conflicts or incompatibility with adjacent areas are usually the result of other environmental effects, such as the generation of noise or objectionable odors. Potential land use conflicts to adjacent areas resulting from the effects of the proposed project are discussed below. Noise, traffic, air quality, and public service-related effects of the proposed project to nearby areas are discussed in detail in other relevant sections of the EIR.

Important Farmland (Important Farmland, Unique Farmland, and Farmland of Statewide Importance) in the project area was identified using GIS data from the California Department of Conservation FMMP in order to determine the location and extent of Important Farmland in the project area. The proposed project was analyzed to determine the potential extent of Important Farmland conversion, agricultural zoning designation conflicts, incompatibility with existing Williamson Act contracts, or other changes resulting from the project's implementation which would remove Important Farmland from agricultural production.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the General Plan and zoning ordinance) adopted for the purpose of avoiding or mitigating a significant environmental effect;
- Conflict with any applicable habitat conservation plan or natural community conservation plan:
- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use or a Williamson Act;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));
- Result in the loss of forest land or conversion of forest land to non-forest use; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

Impacts Not Further Evaluated

Physically divide an established community. Construction and operation of facilities associated with the proposed project would be located within the City of Fresno, the SOI, and a small portion of an unincorporated area of Fresno County. Water conveyance facilities would either be located within existing facilities, such as within the Fresno Canal and Mill Ditch (Conveyance Option 1), or would be located underground. Associated pipeline appurtenances (i.e., blowoff and air valves) would be located, for the most part, within easements along existing roadways within the City and County of Fresno. Above ground facilities, such as the proposed SWTF facilities, groundwater wells, and groundwater recharge basins would be sized and sited to minimize disturbance to existing and planned uses. Therefore, construction and operation of the proposed project would not physically divide existing communities in the project area and no impact would occur. This issue will not be further evaluated in the EIR.

Conflict with applicable habitat conservation plan or natural community conservation plan. There is not an adopted habitat conservation plan or natural community conservation plan in the City of Fresno SOI. Therefore, implementation of the proposed project would not conflict with any adopted plans and not impact would occur. This issue will not be further evaluated in the EIR.

Conflict with zoning for forest land or timberland or convert forest land to non-forest uses. The proposed project area is not zoned for forest land or timberland as defined in the Public Resources Code and contains no forest uses; therefore, no impact would occur and this issue will not be further evaluated in the EIR.

Impact Summary

Table 4.2-2 provides a summary of the impact analysis for issues related to land use and agriculture.

TABLE 4.2-2
PROPOSED PROJECT IMPACT SUMMARY – LAND USE AND AGRICULTURE

	Near-Term Project Elements		Future Project Elements	
Impact	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Impact 4.2.1: Implementation of the proposed project would include the construction and operation of water treatment, storage and transmission facilities that could conflict with existing and planned land uses and land use policies.	LS	NA	LS	NA
Impact 4.2.2: Implementation of the proposed project could result in the permanent conversion of land designated by the Department of Conservation FMMP as Prime Farmland, Farmland of Statewide Importance or Unique Farmland.	LS	NA	LS	NA
Impact 4.2.3: Implementation of the proposed project could result in conflicts with existing zoning for agricultural use or a Williamson Act contract.	LS	NA	LS	NA
Impact 4.2.4: Implementation of the proposed project could result in the conversion of farmland to non-agricultural uses.	LS	NA	LS	NA
Impact 4.2.5: Implementation of the proposed project, when combined with development of other future projects, could make a cumulatively considerable contribution resulting in adverse impacts on agricultural resources.	LS	NA	LS	NA

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less than Significant Impact
NA = Not Applicable

Impacts and Mitigation Measures

Impact 4.2.1: Implementation of the proposed project would include the construction and operation of water treatment, storage and transmission facilities that could conflict with existing and planned land uses and land use policies. (Less than Significant)

Near-Term and Future Project Elements

The proposed project would expand the City's water system to address groundwater level declines and water quality concerns; to diversify the City's water supply portfolio; and enhance overall water supply reliability. Proposed project facilities would be located so as to serve urban uses within the City and SOI. Land uses within the City and SOI are predominately urban in nature (residential, commercial, etc.). Transmission pipelines would primarily be installed underground in existing road rights-of-way to minimize conflicts with surrounding land uses. Improvements to the NE SWTF would occur on the existing site. Construction of the SE SWTF would occur on fallow farmland that is currently designated as industrial and compatible with the type of use found at a water treatment facility. Adjacent uses include rural residential housing, an elementary school, a golf course, as well as farmland and other open space areas. While the exact location of the SW SWTF, groundwater wells, and groundwater recharge basin is not currently known, it is anticipated that these facilities would be sited and developed in a manner that protects the integrity of the surrounding land use by ensuring the final locations would minimize operational impacts to sensitive uses (including residential uses), as appropriate.

As stated in the regulatory setting, various adopted specific and community plans in the City of Fresno include policies that support the development and use of water supply facilities as part of meeting their individual water demands to serve planned growth. Therefore, the siting and operation of both near-term and future project elements would not conflict with existing or planned land uses or adopted land use plans and this is considered a less-than-significant impact.

Environmental impacts associated with the construction and operation of the proposed project, including but not limited to air emissions, noise, visual impacts, disturbance or loss of biological resources or cultural resources, are evaluated in Sections 4-3 through 4-12.

Mitigation (NT/F): None required.

Impact 4.2.2: Implementation of the proposed project could result in the permanent conversion of land designated by the Department of Conservation FMMP as Prime Farmland, Farmland of Statewide Importance or Unique Farmland. (Less than Significant)

Near-Term and Future Project Elements

The majority of lands within the City of Fresno are classified as urban. Even though the majority of land outside the City limits within the SOI has been planned for urban uses, there are lands designated as Prime Farmland, and lands classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland in Fresno County (approximately 1.29 million acres, see Table 4.2-1) and development projects, including the proposed project could result in the permanent conversion of classified farmland. However, construction and operation of facilities associated with the proposed project with few exceptions would be located within the City of Fresno's SOI which has limited classified farmland. Construction and operation of all near-term and future project elements, with the exception of the Conveyance Options 1 and 2 facilities, would be located entirely within the City of Fresno's SOI which has limited classified farmland. Proposed project facilities that would be constructed on or adjacent to classified farmland would be limited to

Conveyance Options 1 and 2; however, construction and operation of these facilities would be contained to existing FID facilities and easements held by FID (Conveyance Option 1), or would be constructed within existing easements or road rights-of-way. Because of the limited nature of important farmland within the urban core of the City, the proposed project is not anticipated to result in the permanent conversion of classified farmland. Therefore this impact is less-than-significant.

Mitigation (NT/F): None required.

Impact 4.2.3: Implementation of the proposed project could result in conflicts with existing zoning for agricultural use or a Williamson Act contract. (Less than Significant)

Near-Term and Future Project Elements

While Williamson Act lands are located throughout Fresno County, they are generally not in the urban centers such as the City of Fresno SOI. The only proposed facility located on or adjacent to Williamson Act lands is the proposed SE SWTF, and it is located on a parcel for which non-renewal has been filed. Therefore, implementation of the proposed project would not conflict with Williamson Act lands and this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

Impact 4.2.4: Implementation of the proposed project could result in the conversion of farmland to non-agricultural uses. (Less than Significant)

Near-Term and Future Project Elements

As described under Impact 4.2.1, the majority of lands within the City of Fresno are classified as urban which includes residential, industrial, commercial, public facilities and open space/parkland. Even though the majority of land outside the City limits within the SOI has been planned for urban uses, there are areas on the border of the City that are classified for or currently supporting agricultural uses. Because construction and operation of most facilities associated with the proposed project would be located within the urban area of the City of Fresno's SOI, impacts to classified farmland would be less than significant. However, the SE SWTF site and Conveyance Options 1 and 2, which are primarily located within unincorporated Fresno County, are located in areas on or adjacent to lands with past and present agricultural uses. The SE SWTF site has historically been used for agriculture, however, it is now no longer in agricultural production. Additionally, parcels to the north and south of the SE SWTF, as well as the SE SWTF site itself, are designated light industrial to support future planned industrial development. Conveyance Options 1 and 2 are also located on or adjacent to farmland. However, improvements to the Fresno Canal and Mill Ditch and construction of the pump station associated with Conveyance Option 1, would be confined to the existing FID and City of facilities and easements held by FID. Conveyance Option 2 would generally be constructed within existing easements or road rights-of-way, and the new intake/diversion and pump station would be constructed on existing FID or City owned facilities and would not on extend onto adjacent agricultural lands.

Impacts to agricultural lands associated with operations of most near and future term project elements are not expected because they are not located near agricultural lands. Operational impacts to agricultural lands associated with Conveyance Options 1 and 2 are not anticipated because both options would involve the passive delivery of surface water either through an existing canal or an underground pipeline. Operational maintenance of facilities is also not anticipated to adversely impact adjacent agricultural lands as they would be infrequent. Therefore, no classified or designated farmland would be permanently converted as a result of implementation of the proposed project. This would be a less-than-significant impact.

Mitigation (NT/F): None required.

The cumulative context for land use and agricultural resources includes the City of Fresno SOI and Fresno County.

Impact 4.2.5: Implementation of the proposed project, when combined with development of other future projects, could make a cumulatively considerable contribution resulting in adverse impacts on agricultural resources. (Less than Significant)

Near-Term and Future Project Elements

As described above, the majority of lands within the City of Fresno are classified as urban and built up. Even though the majority of land outside the City limits within the SOI has been planned for urban uses, there are designated agricultural lands, including Prime Farmland, and lands classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland in Fresno County (approximately 1.3 million acres, see Table 4.2-1). Development projects, including the proposed project, could result in the permanent conversion of classified farmland. This is considered a significant cumulative impact.

However, construction of facilities associated with the proposed project, with a few exceptions, would be located within the urban area of the City of Fresno's SOI, which has limited classified farmland. Project facilities that are located on or adjacent to agricultural lands would either be confined to existing facilities or easements or within road rights-of-way. Operational impacts to agricultural lands are also not anticipated because project facilities would not be located on or adjacent to classified agricultural lands with the exception of Conveyance Options 1 and 2. However, the passive nature of the operations of both conveyance options facilities and limited and infrequent maintenance requirements are not expected to result in impacts to adjacent agricultural areas. Therefore, no classified agricultural lands would be converted to non-agricultural uses as a result of the implementation of the proposed project and the proposed project's contribution would be less than considerable when compared to the total amount of classified farmland in Fresno County and this would be a less-than-significant cumulative impact.

Mitigation (NT/F): None required.

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4.3 Geology and Soils

This section identifies and evaluates the potential effects of implementing the proposed project on geology, soil resources, and seismicity. The setting discussion describes local topography, geology, soil resources and regional seismicity, and summarizes applicable state, local and regional plans and programs, objectives and policies as relevant to geology, soils, and seismicity.

No comments were received addressing geology and soils in response to the NOP (see Appendix B).

4.3.1 Environmental Setting

Geology and Topography

The City of Fresno is located in the southern portion of the Great Valley geomorphic province of California (Central Valley). This geomorphic province is characterized as a northwestward-trending trough that formed between the Coast Range Mountains to the west and the Sierra Nevada to the east. The Central Valley is about 50 miles wide and extends for 400 miles through the center of California (CGS, 2002). The northern and southern portions of the Great Valley are referred to as the Sacramento Valley and San Joaquin Valley, respectively; with the Sacramento River draining areas to the north and the San Joaquin River draining areas to the south. The Central Valley formed as a consequence of the accumulation of sediments that eroded from the Sierra Nevada to the east, and were deposited in this region approximately 65 million years ago (Hackel, 1966). This geologic unit is commonly referred to as the Great Valley Sequence. Sediments deposited in the proposed project area were derived from Sierra Nevada bedrock, and from volcanic activity that occurred in the Sierra Nevada region during the Holocene to Tertiary periods (3 to 38 million years ago). These Tertiary-aged sediments form the principal groundwater aquifers of the Central Valley. The most recent deposits in the area are floodplain deposits consisting of clay, silt, and some sand (Fresno County, 2000).

The topography of the Central Valley is relatively level, with elevations ranging from a few feet to a few hundred feet above mean sea level (msl). The proposed project area is situated on the valley floor topography which consists of flat or gently sloping terrain and an elevation approximately 300 feet above msl. The exception to the City's generally flat topography is the San Joaquin River Bluffs area along the northern edge of the City (City of Fresno Planning and Development Department, 2002).

Soils

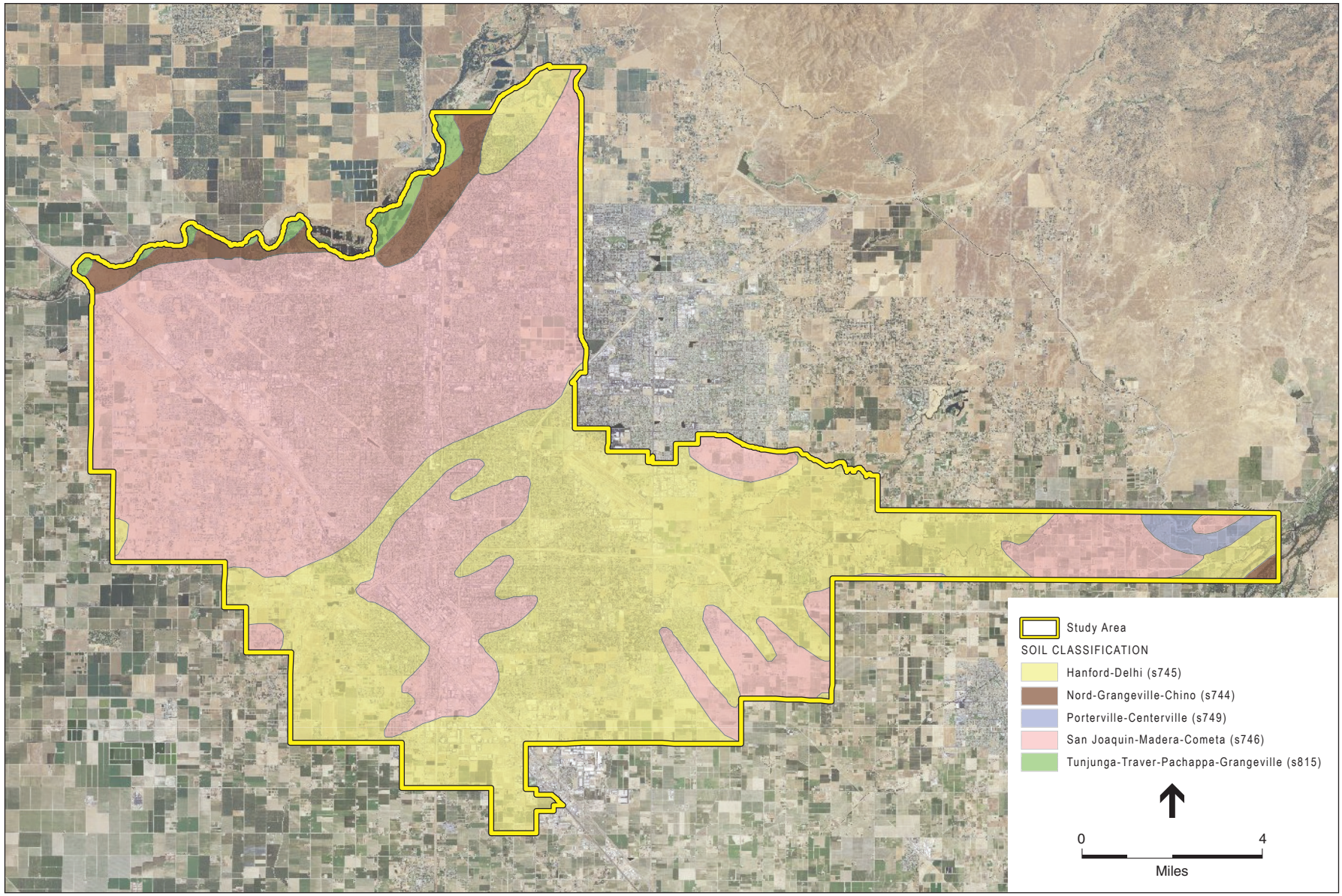
Soils can have properties that could represent limitations for construction. In the context of the proposed project such limitations include the potential for water and/or wind erosion, subsidence, shrink-swell behavior, and corrosion as described below.

- **Erosion** is the process whereby soil materials become detached and are transported either by wind or water. Rates of erosion can vary depending on the soil texture, structure, and amount of organic matter. The corresponding slope, length, and degree of steepness are also prime factors in determining the potential for soil erosion.

- **Subsidence** is the lowering of the land surface due to loss or compaction of underlying materials. Subsidence can occur as the result of hydrocompaction; groundwater, gas, and oil extraction; or the decomposition of highly organic soils.
- **Expansive Soils** are soils that exhibit a "shrink-swell" behavior. "Shrink-swell" is the cyclical expansion and contraction that occurs in fine-grained clay sediments from wetting and drying. Structures located on soils with this characteristic may be damaged over a long period of time, usually as the result of inadequate foundation engineering.
- **Corrosive Soils** can damage underground utilities including pipelines and cables, and can weaken roadway structures. Soils within the proposed project area are classified as highly corrosive to concrete and/or steel.

Figure 4.3-1 provides a map of soils within the proposed project area. In general, soil resources within the proposed project area are characterized by well-drained alluvial soils (USDA, 1971). Primary soil groups in proposed project area are described as follows:

- **Hanford-Delhi-Tujunga.** The soils in this association are found at elevations ranging from 180 to 500 feet. Hanford soils are typically found on alluvial fans and are derived from granite. These soils are well-drained and have a low shrink-swell potential and low erosion hazard. Hanford soils have a low to moderate potential for corrosion of untreated steel. Delhi soils are typically found on alluvial fans and are derived from granite. These soils are well-drained and have a low shrink-swell potential and low erosion hazard. Delhi soils have a low potential for corrosion of untreated steel. Tujunga soils are typically found on alluvial fans and are derived from granite. These soils are well-drained and have a low shrink-swell potential and low erosion hazard. Tujunga soils have a low potential for corrosion of untreated steel (NRCS, 2013).
- **San Joaquin-Cometa-Madera.** The soils in this association are found at elevations ranging from 250 to 600 feet. San Joaquin soils are typically found on alluvial fans and are derived from granite. These soils are well-drained and have a moderate shrink-swell potential and low erosion hazard. San Joaquin soils have a high potential for corrosion of untreated steel. Cometa soils are typically found terraces and are derived from granite. These soils are well-drained and have a moderate shrink-swell potential and low erosion hazard. Cometa soils have a high potential for corrosion of untreated steel. Madera soils are typically found on alluvial fans and terraces and are derived from granite. These soils are well-drained and have a moderate shrink-swell potential and low erosion hazard. Madera soils have a high potential for corrosion of untreated steel (NRCS, 2013).
- **Grangeville-Pachappa-Traver.** The soils in this association are found at elevations ranging from 160 to 500 feet. Grangeville soils are coarse textured soils that formed in recent granitic alluvium. These soils are somewhat poorly drained and have a low shrink-swell potential and low erosion hazard. Grangeville soils have a moderate to high potential for corrosion of untreated steel. Pachappa soils are typically found on alluvial plains and are derived from granite. These soils are well-drained and have a low to moderate shrink-swell potential and moderate erosion hazard. Pachappa soils have a moderate to high potential for corrosion of untreated steel. Traver soils are typically found on alluvial fans and flood plains and are derived from granite. These soils are well-drained and have a low to moderate shrink-swell potential and moderate erosion hazard. Traver soils have a high potential for corrosion of untreated steel.



SOURCE: USDA GSM, 2006; City of Fresno, 2009; West Yost, 2009; ESA, 2013

Figure 4.3-1
Soils in the Proposed Project Area

- **Nord-Grangeville-Chino.** The soils in this association are found at elevations ranging from 160 to 600 feet. Nord soils are loam soils that formed in recent alluvium derived mainly from basic igneous rocks and metamorphic basic igneous rocks. These soils are well-drained and have a low to moderate shrink-swell potential and moderate erosion hazard. Nord soils have a moderate potential for corrosion of untreated steel. Grangeville soils are coarse textured soils that formed in recent granitic alluvium. These soils are somewhat poorly drained and have a low shrink-swell potential and low erosion hazard. Grangeville soils have a moderate to high potential for corrosion of untreated steel. Chino soils are typically found on alluvial fans and are derived from granitic alluvium. These soils are moderately well-drained and have a low to moderate shrink-swell potential and moderate erosion hazard. Chino soils have a moderate to high potential for corrosion of untreated steel.

Seismic and Geologic Hazards

Earthquake Faults

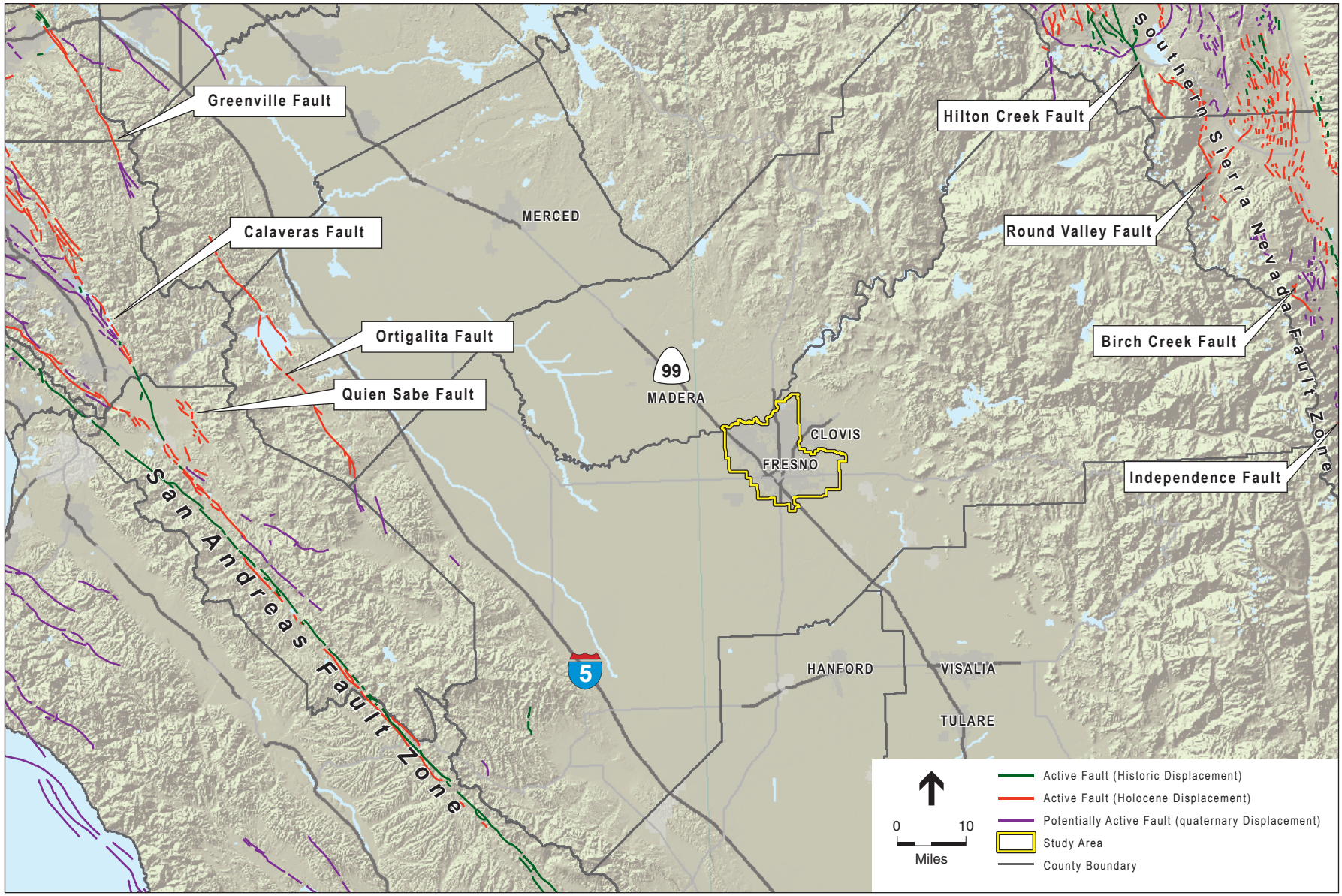
The City of Fresno is situated in an area that has no active earthquake faults and is not in an Alquist-Priolo Special Studies Zone. The immediate Fresno area has extremely low seismic activity levels, although shaking may be felt from earthquakes whose epicenters lie to the east, west and south. Known major faults are over 50 miles distance and include the San Andreas Fault, Coalinga area blind thrust faults, and the Long Valley, Owens Valley, and White Wolf/Tehachapi fault systems.

Based on its distance from earthquake faults, Fresno is classified as being in a moderate seismic risk zone, Category "C" or "D", depending upon the underlying soils and proximity to the nearest known fault lines. All new structures are required to conform to current seismic protection standards in the California Building Code (CBC). Figure 4.3-2 illustrates the regional proximity of these active and other potentially active faults in relation to the proposed project area. Potential seismic and geologic hazards that could be experienced in the project area are described below.

Earthquake Ground Shaking

The California Geologic Survey (CGS) has determined the probability of earthquake occurrences and their associated peak ground accelerations throughout the State of California. A probabilistic seismic hazard map shows the hazards from earthquakes that geologists and seismologists agree could occur in California. The map is probabilistic in the sense that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site.

Maps are typically expressed in terms of probability of exceeding a certain ground motion. Current maps produced by the CGS are based on 10 percent exceedance in 50 years. This probability level allows engineers to design buildings for larger ground motions than those that geologists and seismologists think will occur during a 50-year interval. These levels of ground shaking are used primarily for formulating building codes and for designing buildings. The maps can also be used for estimating potential economic losses and preparing for emergency response. The peak ground acceleration (PGA) in the proposed project area, based on a 10 percent exceedance in 50 years, could range from approximately 0.1 to 0.2g, where g represents 32.1 feet per second per second, or



SOURCE: CDMG, 2006; ESRI, 2007; ESA, 2013

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Figure 4.3-2
Active Regional Faults

the acceleration due to gravity (CGS, 2008). PGA values of this intensity could lead to moderate damage to specially designed structures, partial collapse of ordinary structures, shifting of building foundations, and underground pipe breakage.

Liquefaction

Liquefaction is the sudden temporary loss of shear strength in saturated, loose to medium dense, granular sediments subjected to ground motion. Liquefaction can cause foundation failure of buildings and other facilities due to the reduction of foundation bearing strength.

The potential for liquefaction depends on the duration and intensity of earthquake shaking, particle size distribution of the soil, density of the soil, and elevation of the groundwater. Areas at risk of liquefaction are typified by a high groundwater table and underlying loose to medium-dense, granular sediments, particularly younger alluvium (unconsolidated mixtures of sand, clay, and silt typically deposited by streams) and artificial fill. Clay soils are generally not subject to liquefaction. Holocene-age alluvial sediments are especially prone to liquefaction. Older alluvial sediments deposited during the Pleistocene epoch are generally not liquefiable because they are more consolidated. Artificial fills are also highly prone to liquefaction.

Lateral Spreading

Of the liquefaction hazards, lateral spreading generally causes the most damage. This is a phenomenon where large blocks of intact, non-liquefied soil move downslope on a liquefied substrate of large aerial extent. The mass moves toward an unconfined area, such as a descending slope or stream-cut bluff, and can occur on slope gradients as gentle as 1 degree. Drainages and swales between hill slopes are generally filled by alluvium, colluvium (loose deposits of rock debris accumulated at base of cliff or slope), landslide debris, and slope wash. Unconsolidated deposits often develop soils along steep and shallow slopes in these areas. Risk of lateral spreading in the project area is typically limited to slopes of 0.3 to 5% that are underlain by loose sands and a shallow water table.

Earthquake-Induced Settlement

Settlement of the ground surface can be accelerated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (e.g., loose, non-compacted, and variable sandy sediments) due to the rearrangement of soil particles during prolonged ground shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Typically, areas underlain by artificial fills, unconsolidated alluvial sediments, slope wash, and areas with improperly engineered construction fills are susceptible to this type of settlement.

Slope Instability and Landslides

The San Joaquin River Bluffs are the dominant topographic features within the proposed project area subject to landslides. Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces.

The susceptibility for natural and engineered slopes to fail depends on the gradient and localized geology as well as the amount of rainfall, excavation, or seismic activities. Steep slopes and down-slope creep of surface materials characterize areas that are most susceptible to failure. Engineered slopes have a higher tendency to fail if not properly designed, constructed, or compacted. As the proposed project area is generally flat, hazards associated with landslides would be limited to minor slope movements in the vicinity of the San Joaquin River Bluffs.

4.3.2 Regulatory Setting

State

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong groundshaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. The act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site has to be conducted and appropriate mitigation measures incorporated into the design of the project.

California Building Standards Code

The CBC has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The 2007 CBC is based on the 2006 International Building Code (IBC) published by the International Code Conference. In addition, the CBC contains necessary California amendments which are based on the American Society of Civil Engineers Minimum Design Standards 7-05 which includes requirements for general structural design and means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC.

Local

City of Fresno General Plan

The City of Fresno is currently updating its General Plan; however, as the update process has not been completed, the existing 2025 General Plan has been used in the analysis of the proposed project.

The Safety Element of the City of Fresno's 2025 General Plan contains objectives and policies pertinent to geology, soils and seismicity issues, including:

Objective I-3 Ensure the public's health, safety, and welfare by recognizing potentially geologically unstable conditions that could endanger the lives and property of the Fresno-Clovis Metropolitan Area residents.

Policy I-3a The City of Fresno shall enforce the latest adopted Uniform Building Code and the Dangerous Building Ordinance (Article 12 of Fresno Municipal Code, Chapter 12) to ensure seismic protection for new and existing construction.

Policy I-3d Development shall be prohibited in areas where analysis by a registered civil engineer or registered geologist determines that no corrective measures could feasibly mitigate potential geologic hazards.

Objective I-4 Minimize the loss of life and property on the San Joaquin River bluffs that could occur due to geologic hazards.

Policy I-4a Maintain and enforce the requirements of the city's Bluff Preservation (BP) Overlay Zone District. Development within 300 feet of the toe of the San Joaquin River bluffs shall require an engineering soils investigation and evaluation report that demonstrates that the site is, or methods by which the site could be safe, sufficiently stable to support the proposed development.

Policy I-4b The minimum setback from the San Joaquin River bluff edge (as the bluff edge is defined in the Fresno Municipal Code) for all future structures (including swimming pools, spas, and accessory structures) shall be thirty (30) feet. However, a building setback of less than thirty (30) feet may be permitted of it can be demonstrated to the satisfaction of the City's Building Official and Planning and Development Director that a proposed structure will meet the objective of the Bluff Preservation Overlay Zone District, as stated in the Fresno Municipal Code; but in no case shall the minimum building setback from the bluff edge be less than twenty (20) feet for any structure, and any rear yard encroachments shall be allowed within twenty (20) feet.

Fresno County General Plan

The Health and Safety Element of Fresno County's 2000 General Plan contains goals and policies pertinent to geology, soils and seismicity issues, including

Goal HS-A To protect public health and safety by preparing for, responding to, and recovering from the effects of natural or technological disasters.

Policy HS-A.7 The County shall review the design of all buildings and structures to ensure they are designed and constructed to State and local regulations and standards as part of the building permit plan check process.

Goal HS-D To minimize the loss of life, injury, and property damage due to seismic and geologic hazards.

Policy HS-D.3 The County shall require that a soils engineering and geologic-seismic analysis be prepared by a California-registered engineer or engineering geologist prior to permitting development, including public infrastructure projects, in areas prone to geologic or seismic hazards (i.e., fault rupture, groundshaking, lateral spreading, lurchcracking, fault creep, liquefaction, subsidence, settlement, landslides, mudslides, unstable slopes, or avalanche).

Policy HS-D.4 The County shall require all proposed structures, additions to structures, utilities, or public facilities situated within areas subject to geologic-seismic hazards as identified in the soils engineering and geologic-seismic analysis to be sited, designed, and constructed in accordance with applicable provisions of the Uniform Building Code (Title 24 of the California Code of Regulations) and other relevant professional standards to minimize or prevent damage or loss and to minimize the risk to public safety.

Policy HS-D.5 Pursuant to the Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code, Chapter 7.5), the County shall not permit any structure for human occupancy to be placed within designated Earthquake Fault Zones unless the specific provisions of the Act and Title 14 of the California Code of Regulations have been satisfied.

Policy HS-D.8 The County shall require a soils report by a California-registered engineer or engineering geologist for any proposed development, including public infrastructure projects, that requires a County permit and is located in an area containing soils with high "expansive" or "shrink-swell" properties. Development in such areas shall be prohibited unless suitable design and construction measures are incorporated to reduce the potential risks associated with these conditions.

Policy HS-D.9 The County shall seek to minimize soil erosion by maintaining compatible land uses, suitable building designs, and appropriate construction techniques. Contour grading, where feasible, and

revegetation shall be required to mitigate the appearance of engineered slopes and to control erosion.

Policy HS-D.11 The County shall not approve a County permit for new development, including public infrastructure projects where slopes are over thirty (30) percent unless it can be demonstrated by a California-registered civil engineer or engineering geologist that hazards to public safety will be reduced to acceptable levels.

Policy HS-D.12 In known or potential landslide hazard areas, the County shall prohibit avoidable alteration of land in a manner that could increase the hazard, including concentration of water through drainage, irrigation, or septic systems, undercutting the bases of slopes, removal of vegetative cover, and steepening of slopes.

4.3.3 Impacts and Mitigation Measures

Methods of Analysis

The evaluation was performed in light of current conditions in the proposed project area, applicable regulations and guidelines, and typical activities anticipated to be associated with the installation of proposed Metro Plan Update facilities. Evaluation of potential geologic, soil, and seismic related impacts was based on a review of documents pertaining to the project area including CGS geologic maps and published geologic literature.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Expose people or structures to potential substantial adverse effects, including the risk of, injury, or death involving strong seismic ground shaking, seismic-related ground failure (including liquefaction), or landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of water.
- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Impacts Not Further Evaluated

Expose people or structures to potential substantial adverse effects associated with landslides caused by seismic events and/or unstable soil conditions. The proposed project is located within an area of low relief, having nearly flat terrain. Water conveyance facilities would not be extended into the San Joaquin River Bluffs area which prone to potential landslide activity. High relief landforms containing unconsolidated sediments that could be subject to landslides during seismic events are not located within the project area. No impact would occur and this issue will not be further evaluated in the EIR.

Have soils incapable of supporting use of septic tanks or alternative waste water disposal systems. Wastewater generated at the SWTFs would be piped off site for municipal wastewater treatment. Other proposed project facilities would not generate wastewater requiring treatment. Therefore, the proposed project would not require or result in the use of a septic system or other alternative waste disposal system. No impact would occur and this issue will not be further evaluated in the EIR.

Mineral Resources. According to the 2025 Fresno General Plan (City of Fresno Planning and Development Department, 2002), most of eastern Fresno County is included in the Fresno Production-Consumption (P-C) Region evaluated by California Department of Conservation (DOC) Division of Mines and Geology. Two river areas in the Fresno P-C have been given special Resource Area designation for their concentration of aggregate materials: the upper Kings River and the San Joaquin River. Deposits in these areas are known to be of high quality, may be relatively easily mined, and are close to consumers. A portion of the San Joaquin River Resource Area is located within the City of Fresno's SOI. Although the Metro Plan Update covers water planning within the City's entire SOI, no proposed project elements would be located within the San Joaquin River Resource Area. Therefore, the proposed project would not remove important mineral resources from that area, nor would it construct facilities over this resource area, preventing future resource excavation. No impact would occur and this issue will not be further evaluated in the EIR.

Impacts and Mitigation Measures

Table 4.3-1 provides a summary of the impact analysis for issues related to geology and soils.

TABLE 4.3-1
PROPOSED PROJECT IMPACT SUMMARY – GEOLOGY AND SOILS

Impact	Near-Term Project Elements		Future Project Elements	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Impact 4.3.1 Proposed project facilities could be at risk of potential damage resulting from strong seismic ground shaking, or seismically-related ground failure.	S	LS	S	LS
Impact 4.3.2 Activities associated with construction of proposed project facilities could result in substantial soil erosion or loss of topsoil.	LS	NA	LS	NA
Impact 4.3.3 The project could expose people to injury and structures to damage resulting from unstable soil conditions.	S	LS	S	LS
Impact 4.3.4 Implementation of the proposed project, in combination with other development projects, could increase the risk of damage to structures due to seismically induced groundshaking and unstable soil conditions.	LS	NA	LS	NA

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less than Significant Impact
NA = Not Applicable

Impact 4.3.1 Proposed project facilities could be at risk of potential damage resulting from strong seismic ground shaking, or seismically-related ground failure. (Significant)

Near-Term and Future Project Elements

The City of Fresno is classified as being in a moderate seismic risk zone, Category "C" or "D", depending upon the underlying soils and proximity to the nearest known fault lines. The PGA in the proposed project area could range from approximately 0.1 to 0.2g. PGA values of this intensity could lead to moderate damage to specially designed structures, partial collapse of ordinary structures, shifting of building foundations, and underground pipe breakage.

The potential for liquefaction within the proposed project area is minimal due to the area's well-drained alluvial soil. Therefore, implementation of near-term and future project elements, including new and upgraded SWTFs, pipelines, above ground storage tanks, and groundwater recharge basins would occur in an area subject to potential damage as a result of seismically-induced ground shaking, including liquefaction. This is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level. Mitigation Measure 4.3-1 would ensure that all proposed project facilities and infrastructure would comply with local, State and federal requirements for developing structures to minimize hazards associated with seismic hazards. Completion of site-specific geotechnical engineering studies would identify potential constraints and recommend methods to construct, install and design structures, including foundations, tanks and pipelines to minimize risks. Compliance with CBC standards and guidelines established by the American Water Works Association would further ensure that facilities would be designed consistent with design standards that would reduce the risks associated with seismic activity.

> **Measure 4.3.1a (NT/F):** The City shall prepare a site-specific soil and geotechnical engineering study prior to final design of individual projects under the Metro Plan Update. Each study shall be performed by a licensed professional including, but not limited to, a geologist, engineering geologist, certified soil scientist, certified agronomist, registered agricultural engineer, registered civil or structural engineer, and/or certified professional erosion and sediment control specialist with expertise in geotechnical engineering issues who is registered and/or certified in the State of California, to determine site specific impacts and to recommend site specific mitigations. The site-specific soil and geotechnical engineering studies shall be submitted to the all appropriate State and local regulatory agencies including, but not limited to, City of Fresno's Building and Safety Services Division for review and approval. All feasible recommendations addressing potential seismic hazards and soil constraints shall be implemented.
>
> **Measure 4.3.1b (NT/F):** All buildings shall conform to CBC standards for seismicity, engineered slope stability, and erosion control, as relevant.
>
> **Measure 4.3.1c (NT/F):** All pipelines shall be designed and installed consistent with the guidelines published by the American Water Works Association.
>
> **Significance After Mitigation:** Less than Significant

Impact 4.3.2 Activities associated with construction of proposed project facilities could result in substantial soil erosion or loss of topsoil. (Less than Significant)

Near-Term and Future Project Elements

The proposed project would largely be constructed within urban areas and most pipelines would be placed within existing right of ways; however, construction of the SE SWTF, expansion of other SWTFs, groundwater recharge basins, and other elements would involve earth disturbing activities that could result in the potential for substantial soil erosion and loss of topsoil. Construction of facilities associated with the proposed project would require land clearing, grading, trenching earth moving, and other substantial earthwork, which would expose areas of soil that are not presently exposed. Soils underlying the project area are predominately characterized as having low to moderate erosion potential. Therefore, it is anticipated that the potential for substantial soil erosion or loss of top soil would be limited and this would be a less-than-significant impact.

Evaluation of potential water quality impacts attributed to increased rates of erosion associated with runoff from project construction sites is included in Section 4.4, Hydrology and Water Quality.

Mitigation Measures

Although not required, implementation of the following mitigation measure would ensure that soil erosion and loss of top soil associated with project construction activities would be further reduced by incorporation of recommendations by an erosion and sediment control specialist.

Measure 4.3.2 (NT/F): Implement Mitigation Measure 4.3.1a.

Significance After Mitigation: Less than Significant

Impact 4.3.3: The project could expose people to injury and structures to damage resulting from unstable soil conditions. (Significant)

Near-Term and Future Project Elements

Corrosive and expansive soils could potentially cause damage to surface (SWTFs, storage tanks, intakes and other facilities) and subsurface facilities (transmission pipelines, ASR wells). Depending on the degree of corrosivity of the subsurface soils, building materials such as concrete, reinforcing steel in concrete structures, and bare metal structures exposed to these soils could deteriorate, eventually leading to structural failures. Expansion and contraction of expansive soils in response to changes in moisture content could lead to differential and cyclical movements that could cause damage and/or distress to structures and equipment. Soils in the proposed project area are predominately characterized as having low to moderate expansive (shrink-swell) potential and moderate to high corrosive potential. Therefore, the potential for proposed project facilities to be damaged as a result of underlying unstable soil conditions is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measure would reduce this impact to a less-than-significant level. Mitigation Measure 4.3.1 would ensure that installation of proposed project facilities would comply with applicable laws and regulations and would use standard engineering practices and best management practices including the California Building Standards Code and guidelines published by the American Water Works Association.

Measure 4.3.3 (NT/F): Implement Mitigation Measure 4.3.1.

Significance After Mitigation: Less than Significant

The cumulative context for geology and soils would be proposed project sites and their immediate geographic area that could be affected by construction and operation of proposed project facilities.

Impact 4.3.4: Implementation of the proposed project, in combination with other development projects, could increase the risk of damage to structures due to seismically induced groundshaking and unstable soil conditions. (Less than Significant)

Near-Term and Future Project Elements

Other development proposed in the project area would be subject to the same types of geology, soils, and seismicity impacts as the project. However, these types of impacts represent hazards to people and property on a site-specific basis. For example, corrosive soils at two separate developments do not result in a greater combined impact than the individual impacts do separately. There is little, if any, cumulative relationship between the development of the project and past, present or anticipated future development. Therefore, there would be no cumulative effects related to geology, soils and seismicity and this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

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4.4 Hydrology and Water Quality

This section describes the hydrologic resources that may be affected by the Fresno Metropolitan Water Resources Management Plan Update (proposed project), including surface water hydrology, groundwater, water quality, and flooding. This section also provides an overview of applicable laws and regulations related to hydrologic resources, and an assessment of potential environmental consequences that are anticipated to result, should the proposed project be implemented.

Comments were received on the NOP that are relevant to the hydrology and water quality include concerns about loss of seepage from the FID canal to the underlying groundwater basin, potential interference with groundwater recharge, and identification of Central Valley Flood Protection Board (CVFPB) jurisdiction and permitting requirements. Please see Appendix B for NOP comment letters.

4.4.1 Environmental Setting

Surface Water Resources

A network of small, channelized streams and canals extend throughout the City of Fresno (City). As shown on Figure 4.4-1, these include Dry Creek, Dog Creek, Mill Creek, Herndon Canal, Gourd Canal, and Fancher Creek Canal. As described below, these waterways provide drainage and water conveyance within the City and, through a network of natural and engineered intermittent drainages, eventually flow into the San Joaquin River and the Sacramento-San Joaquin Delta. The Kings River is located approximately 25 miles south of the City on the southern border of Fresno County.

San Joaquin River

The San Joaquin River originates in the southern Sierra Nevada, to the east of Fresno. With a length of approximately 330 miles, it is the second longest river in California, second to the Sacramento River. The San Joaquin River watershed encompasses about 32,000 square miles. Major tributaries in the watershed include the Stanislaus River, Tuolumne River, and the Merced River, which are all located north of the City and its SOI. The San Joaquin River eventually drains into the Sacramento-San Joaquin River Delta, the San Francisco Bay, and the Pacific Ocean. During most seasons, upstream portions of the river have been hydraulically disconnected from downstream portions, due to regional water infrastructure management practices, which include significant impoundments for agriculture and other purposes. However, starting in 2009, water was released from Friant Dam in support of restoration activities along approximately 150 miles of the river.

Kings River

The Kings River drains from the Sierra Nevada within Kings Canyon National Park and its vicinity, westward towards the City of Fresno. At the toe of the Sierra Nevada foothills, the river turns in a southwesterly direction, and flows along a network of channels into the region that was

once Tulare Lake. In total the river is about 126 miles long, and supports agriculture and groundwater recharge in the Central Valley. Pine Flat Dam, located along the river to the East of the City, is a 440-foot concrete dam operated by the U.S. Army Corps of Engineers (Corps). The reservoir has a capacity of approximately 1 million acre-feet (af). The river, via FID infrastructure, provides water to Fresno and its vicinity for groundwater recharge and other beneficial uses. The Kings River is connected with the San Joaquin River via the Fresno Slough and James Bypass.

Surface Water Quality

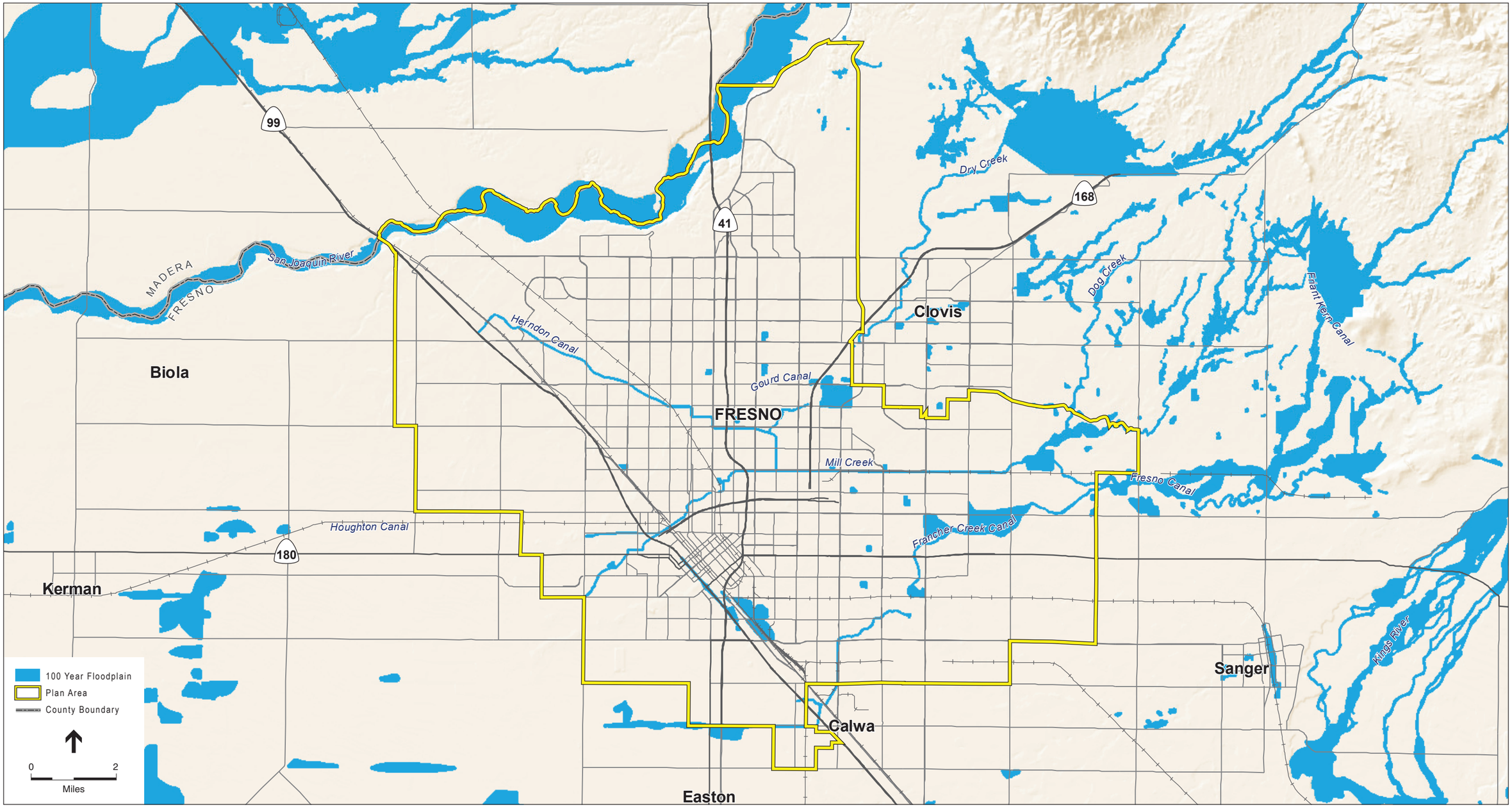
Water quality within the small, channelized streams and canals in and adjacent to the City varies seasonally. During the rainy season, water quality is strongly influenced by runoff from agricultural fields upstream of the City, and by urban runoff from within the City. Especially during first flush events, road-related urban pollutants including oils, greases, brake dust, and sediment are flushed into the system. During the summer irrigation system, water quality is influenced by agricultural water supply and tailwaters, which are conveyed along area drainages.

Within the San Joaquin and Kings rivers, water quality is also influenced by summertime agricultural return flows, and by winter stormwater runoff and high flow events. Sediment loading during major events can be considerable. In the vicinity of Fresno, water quality along the San Joaquin River is relatively good. The State Water Resources Control Board's (SWRCB) 303(d) List of Impaired Water Bodies indicates that the San Joaquin River in the vicinity of the City is listed for only invasive species, with an estimated Total Maximum Daily Load (TMDL) completion date of 2019 (SWRCB, 2013). Water quality along the San Joaquin River generally decreases downstream and toward the Delta, as the waterway becomes subject to increasing agricultural return flows including saline flows from the western side of the Central Valley.

Water quality along the Kings River, to the south of the City, is more heavily influenced by agricultural runoff. According the SWQCB's 303(d) list, the waterway has elevated levels of Chlorpyrifos (agricultural source), and unknown toxicity (unknown source), with estimated TMDL completion dates of 2021 for both constituents (SWRCB, 2013).

Drainage and Stormwater Management

Stormwater management in the City of Fresno is provided by the Fresno Metropolitan Flood Control District (FMFCD), which facilitates the controlled collection and management of stormwater runoff, and promotes measures to reduce flooding, erosion, and siltation along streambeds. FMFCD's drainage infrastructure conveys stormwater to a series of flood control basins. These basins are scattered across the FMFCD's service area. The flood control basins serve a secondary purpose of supporting groundwater recharge, and approximately 55 percent of total annual stormwater percolates into the underlying aquifer, for later extraction and beneficial use (City of Fresno, 2002).



SOURCE: FEMA, 2005; ESRI, 2007; ESA, 2013

Figure 4.4-1
FEMA Floodplains in the Vicinity of the Project Area

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While these stormwater/groundwater recharge basins capture a substantial portion of the total stormwater flows from the City, larger storm events can exceed the capacity of these facilities. Therefore, during large storm events, stormwater is discharged into canals or groundwater recharge basins. Discharges into the stormwater system are conveyed for eventual discharge into additional groundwater recharge facilities, or if capacity is unavailable, eventual discharge into the San Joaquin River. In portions of the City that are near San Joaquin River, FMFCD also maintains stormwater drainage systems that convey stormwater directly into the San Joaquin River.

Flooding

As defined by Federal Emergency Management Agency (FEMA), areas located within a 100-year flood zone are those areas that would be subject to flooding during a storm event having a 1 percent annual chance of occurrence. As shown in Figure 4.4-1, FEMA-defined 100-year flood zones are located along a northeast to southwest corridor that crosses the City, as well as along select areas of Mill Creek, and in the downtown area of the City.

Groundwater

The proposed project area is located in the Kings Subbasin of the San Joaquin Valley Groundwater Basin. The subbasin is bounded to the north by the San Joaquin River, to the west by the Delta-Mendota and Westside Subbasins, to the south by the northern boundary of the Empire West Side Irrigation District, the southern fork of the Kings River, the southern boundary of Laguna Irrigation District, and the boundaries of several other water districts. The eastern boundary of the subbasin is the interface between valley sediments and the granitic rock of the Sierra Nevada foothills. The San Joaquin and Kings Rivers are the principal surface waters that are in or along the edge of the subbasin, although many smaller drainages and canals are also present.

The aquifer contained in the Kings Subbasin is comprised of unconsolidated continental deposits of Tertiary or Quaternary age, overlain by younger, Quaternary age deposits. These include older alluvium, lacustrine and marsh deposits, younger alluvium, and flood basin deposits. The older alluvium forms an important aquifer in the subbasin, and is comprised of lenses of clay, silt, silty and sandy clay, sand, gravel, cobbles, and boulders. The younger alluvium is of similar composition, and is highly permeable beneath river channels, although it may have low permeability along flood plains. Quaternary deposits yield more than 90 percent of the groundwater pumped from wells (DWR, 2006).

Groundwater Levels and Storage

Groundwater levels are variable across the subbasin, with some areas subject to substantial recharge and/or drawdown. The California Department of Water Resources (DWR, (2006) noted two distinct groundwater depressions within the subbasin: one centered under the Fresno-Clovis urban area, and the other about 20 miles southwest of Fresno in agricultural areas. Total groundwater storage in the subbasin is estimated at approximately 93 million af, to a depth of 1,000 feet or less (DWR, 2006).

As discussed in the Metro Plan Update Phase 1 Report (City of Fresno, 2007), the City's water supply relies on the underlying Kings groundwater sub basin, which is part of the greater San Joaquin Valley Groundwater Basin. By 2025, the City would use approximately 150,000 AFY of stored groundwater during a normal hydrologic year if it continues to meet increasing water demands from groundwater. With already declining groundwater levels, each year that the City continues to operate in this mode would continue to accelerate groundwater level declines in the basin, and further impact groundwater resources in the region.

Groundwater Recharge

Groundwater recharge in the system results from river and stream seepage, canal seepage, deep percolation of irrigation water, and substantial intentional recharge. Several local entities, including the City of Fresno, City of Clovis, FID, and FMFCD have formed a cooperative to use and operate various facilities in support of groundwater recharge. The Fresno-Clovis metropolitan area uses a regional sewage treatment facility that disposes of water in about 1,400 acres of spreading basins/percolation ponds to the southwest of Fresno. The City's Leaky Acres facility, located northwest of the Fresno Yosemite International Airport, provides an additional 210 acres of groundwater recharge facilities. These and many other smaller recharge facilities support substantial groundwater recharge in the subbasin.

As discussed in Section 4.3, Geology and Soils, a large portion of the project area is underlain by the Hanford-Delhi-Tujunga and San Joaquin-Cometa-Madera soils associations. These two soil associations are characterized by fine to moderately coarse textured alluvium that is well to excessively drained. These soils associations are expected to be well suited to groundwater recharge via percolation. Small areas of the Grangeville-Pachappa-Traver and Nord-Grangeville-Chino soils associations are located along the northern edge of the project area, adjacent to and just south of the San Joaquin River. These soils associations are poor to well drained, and additional areas potentially suitable to groundwater recharge via percolation may also be identified within these soils associations.

Groundwater Quality

Groundwater in the vicinity of the proposed project area has moderate levels of total dissolved solids (TDS). TDS concentrations generally range from about 200 to 700 milligrams per liter (mg/L), although values greater than 600 mg/L are rare in upper (e.g., typically used) aquifer layers. At greater depth, groundwater having TDS concentrations of 2,000 mg/L or greater has been identified (DWR, 2006). A 2006 survey by the State Department of Public Health (414 samples across the subbasin) indicated an average of 240 mg/L, ranging from 40 to 570 mg/L (DWR, 2006). Portions of the groundwater basin are also subject to impairments associated with historic or ongoing releases of hazardous chemicals from superfund and other hazardous materials sites. These sources of subsurface contamination are discussed in greater detail in Section 4.9, Hazards and Hazardous Materials.

4.4.2 Regulatory Setting

Federal

Clean Water Act

The federal Clean Water Act (CWA) established the basic structure for regulating discharges of pollutants into "waters of the United States." The act specifies a variety of regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Relevant parts of the CWA include Sections 303 and 304; Section 401; Section 402; and Section 404, as further described below.

Clean Water Act Section 303(d) Impaired Waters List

Under Section 303(d) of the CWA, states are required to develop lists of water bodies that would not attain water quality objectives after implementation of required levels of treatment by point-source dischargers (municipalities and industries). Section 303(d) requires that the state develop a TMDL for each of the listed pollutants. The TMDL is the amount of loading that the water body can receive and still be in compliance with water quality objectives. The TMDL can also act as a plan to reduce loading of a specific pollutant from various sources to achieve compliance with water quality objectives. The TMDL prepared by the state must include an allocation of allowable loadings to point and nonpoint sources, with consideration of background loadings and a margin of safety. The TMDL must also include an analysis that shows the linkage between loading reductions and the attainment of water quality objectives. The EPA must either approve a TMDL prepared by the state or, if it disapproves the state's TMDL, issue its own. National Pollutant Discharge Elimination System (NPDES) permit limits for listed pollutants must be consistent with the waste load allocation prescribed in the TMDL. After implementation of the TMDL, it is anticipated that the problems that led to placement of a given pollutant on the section 303(d) list would be remediated. In California, preparation and management of the section 303(d) list is administered by the Regional Water Quality Control Boards (RWQCB). The Kings River and the San Joaquin River are both included on the 303(d) List, as discussed previously.

National Pollutant Discharge Elimination System Permit Program

The NPDES permit program was established by the CWA to regulate municipal and industrial discharges to surface waters of the United States. Federal NPDES permit regulations have been established for broad categories of discharges, including point-source municipal waste discharges and nonpoint-source stormwater runoff. NPDES permits generally identify the following:

- effluent and receiving-water limits on allowable concentrations and/or mass emissions of pollutants contained in the discharge;
- prohibitions on discharges not specifically allowed under the permit; and
- provisions that describe required actions by the discharger, including industrial pretreatment, pollution prevention, self-monitoring, and other activities.

The EPA has delegated its NPDES permitting function relevant to the Action Area to the State Water Resources Control Board (SWRCB), and the RWQCBs. Within this framework, the state

board provides coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity, as described in greater detail later in this section.

Executive Order 11988 and the Federal Emergency Management Agency

Under Executive Order 11988, FEMA is responsible for management of floodplain areas. FEMA administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (AEP) (i.e., the 100-year flood event). Specifically, where levees provide flood protection, FEMA requires that the levee crown have three feet of freeboard above the 1-in-100-AEP water surface elevation, except in the vicinity of a structure such as a bridge, where the levee crown must have four feet of freeboard for a distance of 100 feet upstream and downstream of the structure. State the areas related to the project that are within a flood zone.

Safe Drinking Water Act

Under the Safe Drinking Water Act (SDWA, Public Law 93-523), passed in 1974, the EPA regulates contaminants of concern to domestic water supply. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by EPA primary and secondary Maximum Contaminant Levels (MCLs) that are applicable to treated water supplies delivered to the distribution system. MCLs and the process for setting these standards are reviewed triennially. Amendments to the SDWA enacted in 1986 established an accelerated schedule for setting MCLs for drinking water. EPA has delegated to the DPH the responsibility for administering California's drinking-water program. DPH is accountable to EPA for program implementation and for adopting standards and regulations that are at least as stringent as those developed by EPA. The applicable state primary and secondary MCLs are set forth in Title 22, Division 4, Chapter 15, Article 4 of the CCR. State applicability to the project

State

California State Nondegradation Policy

In 1968, as required under the federal antidegradation policy described above, the SWRCB adopted a nondegradation policy aimed at maintaining high quality for waters in California. The nondegradation policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. The policy provides as follows:

1. Where the existing quality of water is better than required under existing water quality control plans, such quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the State and would not unreasonably affect present and anticipated beneficial uses of such water.
2. Any activity which produces waste or increases the volume or concentration of waste and which discharges to existing high-quality waters would be required to meet waste discharge

requirements which would ensure: (1) pollution or nuisance would not occur; and (2) the highest water quality consistent with the maximum benefit to the people of the State would be maintained.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, as revised in December, 2007, provides for protection of the quality of all waters of the State of California for use and enjoyment by the people of California. It further provides that all activities that may affect the quality of waters of the State shall be regulated to obtain the highest water quality that is reasonable, considering all demands being made and to be made on those waters. The Act also establishes provisions for a statewide program for the control of water quality, recognizing that waters of the state are increasingly influenced by interbasin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the state. The statewide program for water quality control is therefore administered most effectively on a local level, with statewide oversight. Within this framework, the Act authorizes the SWRCB and regional boards to oversee responsibility for the coordination and control of water quality within California, including those responsibilities under the CWA that have been delegated to the state. See discussion on the Central Valley Water Quality Control Plan below.

State Water Resources Control Board

Created by the California State Legislature in 1967, the SWRCB holds authority over water resources allocation and water quality protection within the state. The five-member SWRCB allocates water rights, adjudicates water right disputes, develops statewide water protection plans, establishes water quality standards, and guides the nine Regional Water Quality Control Boards. The mission of SWRCB is to, "preserve, enhance, and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations."

Central Valley Regional Water Quality Control Board

As authorized by the Porter-Cologne Water Quality Control Act, the CVRWQCB primary function is to protect the quality of the waters within its jurisdiction, including the proposed project area, for all beneficial uses. State law defines beneficial uses of California's waters that may be protected against quality degradation to include, but not be limited to: 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.

The CVRWQCB implements water quality protection measures by formulating and adopting water quality control plans (referred to as basin plans, as discussed below) for specific groundwater and surface water basins, and by prescribing and enforcing requirements on all agricultural, domestic, and industrial waste discharges. The CVRWQCB oversees many programs to support and provide benefit to water quality, including the following major programs: Agricultural Regulatory; Above-Ground Tanks; Basin Planning; CALFED; Confined Animal Facilities; Landfills and Mining; Non-Point Source; Spills, Leaks, Investigations, and Cleanups (SLIC); Storm Water; TMDL; Underground Storage Tanks (UST), Wastewater Discharges (including the NPDES); Water Quality Certification; and Watershed Management.

Basin Plans and Water Quality Objectives

The Porter-Cologne Water Quality Control Act provides for the development and periodic review of water quality control plans (basin plans) that are prepared by the regional water quality control boards. Basin plans designate beneficial uses of California's major rivers and groundwater basins, and establish narrative and numerical water quality objectives for those waters. Beneficial uses represent the services and qualities of a water body (i.e., the reasons why the water body is considered valuable), while water quality objectives represent the standards necessary to protect and support those beneficial uses. Basin plans are primarily implemented through the NPDES permitting system and by issuing waste discharge regulations to ensure that water quality objectives are met.

Basin plans provide the technical basis for determining waste discharge requirements and taking regulatory enforcement actions if deemed necessary. The proposed project area is located within the jurisdiction of the CVRWQCB. A basin plan has been adopted for the Sacramento and San Joaquin River Basin ("Basin Plan;" CVRWQCB, 2009), which covers all of the proposed project area.

The Basin Plan sets water quality objectives for the surface waters in its region for the following substances and parameters: ammonia, bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, radioactivity, salinity, sediment, settleable material, suspended material, taste and odor, temperature, toxicity, turbidity, and pesticides. For groundwater, water quality objectives applicable to all groundwater have been set for bacteria, chemical constituents, radioactivity, taste, odors, and toxicity (CVRWQCB, 2009).

Specific objectives for concentrations of chemical constituents are also applied to bodies of water based on their designated beneficial uses. The Basin Plan indicates the following beneficial uses for the San Joaquin River (as discussed elsewhere in this section, surface drainages and other stormwater conveyance facilities in the proposed project area discharge into facilities that end in groundwater infiltration basins, or the San Joaquin River) in the vicinity of the proposed project area, as shown in Table 4.4-1:

TABLE 4.4-1
DEFINED BENEFICIAL USES FOR THE SAN JOAQUIN RIVER IN THE VICINITY OF THE CITY OF FRESNO

Beneficial Uses	Type	Beneficial Uses	Type
Municipal and Domestic Supply	Existing	Warm Freshwater Habitat	Existing
Agricultural Irrigation	Existing	Cold Freshwater Habitat	Existing
Stock Waters	Existing	Warmwater Migration	Existing
Contact Recreation	Existing	Coldwater Migration	Existing
Canoeing and Rafting	Existing	Warmwater Spawning	Potential
Noncontact Recreation	Existing	Wildlife Habitat	Existing

SOURCE: CVRWQCB, 2009

NPDES General Permit for Discharges of Stormwater Associated with Construction Activities

Construction activities disturbing one acre or more of land are subject to the permitting requirements of the NPDES General Construction Activity Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). In order to apply for coverage under the General Construction Permit, a project applicant must submit a Notice of Intent (NOI) for coverage under the General Construction Permit to the CVRWQCB and the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) prior to initiating construction activities. Implementation of the SWPPP continues through the completion of the project when an applicant must submit a Notice of Termination to the CVRWQCB notifying the agency that construction is completed. The disturbance to areas associated with construction of structures and facilities for the project would require coverage under a General Construction Permit.

Acquiring coverage under the permit requires a risk-based permitting approach, dependent upon the likely level of risk imparted by a project. The permit also contains several additional compliance items, including: (1) additional mandatory Best Management Practices (BMPs) to reduce erosion and sedimentation, which may include incorporation of vegetated swales, setbacks and buffers, rooftop and impervious surface disconnection, bioretention cells, rain gardens, rain cisterns, implementation of pollution/sediment/spill control plans, training, and other structural and non-structural actions; (2) sampling and monitoring for non-visible pollutants; (3) effluent monitoring and annual compliance reports; (4) development and adherence to a Rain Event Action Plan; (5) requirements for the post-construction period; (6) numeric action levels and effluent limits for pH and turbidity; (7) monitoring of soil characteristics on site; and (8) mandatory training under a specific curriculum.

Fresno County Municipal Separate Storm Sewer Permit (MS4 Permit)

The Fresno County Municipal Separate Storm Sewer Permit (MS4 Permit) includes waste discharge requirements (WDRs) applicable to the City of Fresno, Fresno County, City of Clovis, and CSU Fresno, pursuant to NPDES No. CA0083500 (WDR Order No. 94-244). The permit regulates discharges of stormwater within the City and requires the implementation of various stormwater BMPs in order to minimize discharges of polluted stormwater from urbanized areas. BMPs are implemented under several overarching categories, including public education, illicit discharges, structural controls, operations and maintenance, construction and development, commercial and industrial, and source identification and monitoring. Implementation of these categories of BMPs are implemented through implementing agencies (i.e., the City for the project area), and target specific categories of pollutants including sediments, oils, greases, waxes, floating material, fungi, objectionable growth, taste or odor-producing substances, nuisance materials, toxic pollutants, low dissolved oxygen concentrations, radionuclides, pH, turbidity, and other Regional Board requirements. Adherence to permit conditions is enforced locally and through the Regional Water Quality Control Board at the state level.

Central Valley Flood Protection Board

The CVFPB maintains jurisdiction over the protection of flood control structures within the Central Valley. As relevant to the Project, the CVFPB issues levee encroachment permits and

provides guidelines and requirements for the construction of various facilities within recognized floodways and along levees and other flood control infrastructure. Within the Project area, its vicinity, and downstream along the San Joaquin River, the following waterways are under jurisdiction of the CVFPB: Cresent Bypass, Dry Creek, Dog Creek, Globe Slough, Fresno Slough, Five Mile Slough, Kings River, James Bypass, Lower San Joaquin Flood Control Project, Sand Creek, and the San Joaquin River. A permit from the CVFPB may be required for proposed project elements to the extent that they would be located within a designated floodway.

Local

Fresno Metropolitan Flood Control District

The FMFCD provides flood control and urban storm water and drainage facilities and associated services in Fresno County, including the proposed project area. Its overall service area includes approximately 400 square miles, situated between the Kings and San Joaquin Rivers. Along with flood control and urban drainage services, FMFCD may be responsible for groundwater resources management in its service area, though not in the City of Fresno or other jurisdictions that have primacy, as well as management of select recreation opportunities and open space areas.

For the purposes of program planning, structure, service delivery, and financing, a distinction is made between flood control and local drainage services. The flood control program relates to the control, containment, and safe disposal of storm waters that flow onto the valley floor from the eastern streams. The local drainage program relates to the collection and safe disposal of storm water runoff generated within the urban and rural watersheds or "drainage areas." All are closely integrated and coordinated to provide efficient, comprehensive services. Collectively, these facilities are managed as specified under the FMFCD's Storm Drainage and Flood Control Master Plan.

Fresno Irrigation District

The FID was formed in 1920 under the California Irrigation Districts Act. FID's service area currently encompasses about 245,000 acres located entirely within Fresno County. FID operates about 800 miles of canals and pipelines, and provides irrigation water to over 150,000 acres. Each year, FID delivers about 500,000 acre-feet of water, primarily to agricultural users. FID has entitlements along the Kings River, as well as from the Friant Division of the CVP.

Fresno Regional Groundwater Management Plan

The Fresno Regional Groundwater Management Plan (GMP) was produced cooperatively by ten regional agencies, including the City of Fresno, the Fresno Irrigation District, Fresno Metropolitan Flood Control District, City of Clovis, Malaga County Water District, the City of Kerman, the Bakman Water Company, the County of Fresno, Pinedale County Water District, and Garfield Water District. Objectives of the Fresno GMP include sustaining, protecting, and monitoring groundwater resources in the regional area, as well as the following specific items State applicability or relevance to the project:

- Preserve and enhance the area's existing groundwater quality;
- Mitigate existing groundwater level conditions, and stabilize groundwater levels at the highest practicable levels;

- Maintain untreated groundwater as the primary source of domestic water supply;
- Maximize the available water supply, including conjunctive use of surface water and groundwater;
- Conserve water resources for long-term beneficial use;
- Assure an adequate water supply for the future;
- Manage groundwater resources to the extent necessary to ensure reasonable, beneficial, and continued use of the resource;
- Monitor groundwater quality and quantity to provide baseline information for establishing groundwater policies, goals, and recommended actions, and;
- Improve coordination and consistency among agencies responsible for the monitoring and management of groundwater in the area considered.

Fresno-Clovis Storm Water Quality Management Program

A Storm Water Quality Management Program (SWQMP) prepared by the FMFCD was adopted for use in Fresno, Clovis and urban areas of Fresno County in 2005. It is intended to reduce the discharge of potential water quality pollutants from the local storm drain system. The existing system is separate from the City's sewer system, and discharges to natural waterways. The SWQMP provides for the implementation and enforcement of a series of BMPs, which are meant to protect downstream water quality from urban water quality pollutants associated with stormwater runoff. The SWQMP is designed to protect water quality to the maximum extent practicable, and to satisfy water quality requirements under the Clean Water Act. BMPs discussed in the SWQMP include construction site runoff control measures, public participation and involvement, detection and elimination of illicit discharges, pollution prevention/good housekeeping, and post-construction runoff control. A series of measurable goals are also implemented under the SWQMP, which have the purpose of serving as a performance standard for the program and which would apply to the proposed project.

City of Fresno Flood Plain Ordinance

Construction restrictions in floodplains are addressed in Chapter 11, Article 6 of the City code. The requirements contained therein are meant to protect human life, minimize public expense for costly flood control projects, minimize the need for rescue and relief efforts in the event of a flood, minimize flood related interruptions to businesses, minimize damage to public facilities, avoid future blight from flood damage, and other requirements meant to minimize fiscal and human hazard related effects of flooding in the City. The ordinance seeks to reduce potential losses by restricting or prohibiting uses in floodplains that are subject to potential damage from flooding; requiring that uses vulnerable to floods be protected against flood damage at the time of construction; controlling placement of fill, grading, dredging, and other developments that could increase flood damage; preventing or regulating the construction of flood barriers that could unnaturally divert flood waters or increase flood hazards in other areas; and controlling the alteration of natural floodplains, stream channels, and other natural protective barriers, which help to accommodate flood waters.

Fresno County Flood Ordinance

Chapter 15.48 of the County Code identifies requirements for construction within floodplains, in order to promote public health, safety, and general welfare, and to minimize public and private losses due to flooding and flood conditions. Requirements include various measures to reduce flood related losses including provisions to restrict or prohibit uses that are dangerous to health, safety, and property due to water erosion hazards; requirements that uses vulnerable to flooding be protected against flood damage at the time of construction; controls on the alteration of natural floodplains and other natural floodways; controls on filling, grading, dredging, and other development that could increase flood damage; prevention or regulation of construction of flood barriers; and requirements for precedence over local, less restrictive and conflicting laws, ordinances, and codes.

City of Fresno Recycled Water Master Plan

The Recycled Water Master Plan identifies potential recycled water use opportunities within the City and its SOI and includes a plan for the installation and operation of treatment, storage and distribution infrastructure to serve the City and SOI. In addition to the Master Plan, the City intends to consider the adoption of a "Recycled Water Ordinance" to assist the City in implementing the Recycled Water Master Plan. The purpose of the ordinance would be to establish water recycling policy and criteria for its use within the current City limits as well as its SOI as lands within the SOI are annexed into the City. More specifically, the Ordinance would contain provisions addressing various topics related to implementation of the goals, policies and objectives of the Master Plan.

City of Fresno General Plan

The 2025 Fresno General Plan contains the following objectives that are relevant to the proposed project:

Public Facilities Element

E-21-e Policy Rehabilitate existing infiltration basins and acquire additional sites for infiltration basins as needed.

E-22 Objective Manage and develop the City of Fresno's water facilities to ensure a safe, economical, and reliable water supply for existing and planned urban development and economic diversification.

E-23 Objective Provide facilities to protect lives and property from stormwater runoff hazards.

E-23-I Policy The City of Fresno shall work with the Fresno Metropolitan Flood Control District to prevent and reduce the existence of urban stormwater pollutants to the maximum extent practical, and ensure that surface and groundwater quality, public health and the environment will not be adversely affected by urban runoff, pursuant to the requirements of the National Pollution Discharge Elimination Systems (NPDES) Act.

Resource Conservation Element

G-3 Objective Protect water resources in the area from further degradation in quality.

G-3-a Policy Monitor key water pollutants to determine directions and rates of contaminant travel, in order to achieve cost-effective and timely intervention for containment and remediation of contamination, and to indicate which areas may require water treatment to supply acceptable quality drinking water.

G-3-c Policy Support continued efforts to identify and mitigate detriments to surface and ground water quality that may result from stormwater discharge from urbanized areas.

G-3-d Policy Continue to implement water system policies that ensure compliance with Federal and State Safe Drinking Water Standards.

G-3-i Policy Continue to protect "areas of beneficial natural groundwater recharge by preventing uses which can contaminate soil or groundwater.

G-4-b Policy In cooperation with other agencies, enhance the recharge of groundwater as may be necessary.

G-4-c Policy Address localized groundwater deficiencies and groundwater quality problems that exist or may arise in portions of the planning area.

G-4-d Policy Explore methods of using treated and reclaimed wastewater for irrigating crops and landscaping, while ensuring that there will be no negative impacts on groundwater quality.

Safety Element

1-5 Objective Protect the lives and property of current and future residents of the Fresno Clovis Metropolitan Area (FCMA) from the hazards of periodic floods. Recognize and institute adequate safeguards for the particular flooding hazards of areas on the San Joaquin riverbottom and bluffs.

1-5-e Policy Ensure implementation of land grading and development policies which protect area residents from flooding caused by urban runoff produced by events which exceed the capacity of the Storm Drainage and Flood Control Master Plan system of facilities.

1-5-f Policy The minimum level of design flood protection- shall be the 100-year (one percent) event, as established by the best and most current available data from the U.S. Army Corps of Engineers and the California Department of Water Resources,

pursuant to Federal Emergency Management Agency (FEMA) direction.

Fresno County General Plan

The Public Facilities and Services Element of the County General Plan includes goals and policies relevant to stormwater drainage, flood control, and water quality. The following goals and policies are relevant to the project:

Goal PF-E To provide efficient, cost-effective, and environmentally-sound storm drainage and flood control facilities that protect both life and property and to divert and retain stormwater runoff for groundwater replenishment.

Policy PF-E.6 **Drainage Facility Construction** The County shall require that drainage facilities be installed concurrently with and as a condition of development activity to ensure the protection of the new improvements as well as existing development that might exist within the watershed.

Policy PF-E.7 **Fair-share of Costs** The County shall require new development to pay its fair share of the costs of Fresno County storm drainage and flood control improvements within unincorporated areas.

Policy PF-E.11 **Natural Site Drainage Patterns** The County shall encourage project designs that minimize drainage concentrations and maintain, to the extent feasible, natural site drainage patterns.

Policy PF-E.13 **Natural Storm Water Drainage Systems** The County shall encourage the use of natural storm water drainage systems to preserve and enhance natural drainage features.

Policy PF-E.14 **Retention-Recharge Basins** The County shall encourage the use of retention-recharge basins for the conservation of water and the recharging of the groundwater supply.

Policy PF-E.16 **Minimal Sedimentation and Erosion** The County shall minimize sedimentation and erosion through control of grading, cutting of trees, removal of vegetation, placement of roads and bridges, and use of off-road vehicles. The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.

Policy PF-E.20 **Storm Water Drainage Discharges** The County shall require new development of facilities near rivers, creeks, reservoirs, or substantial aquifer recharge areas to mitigate any potential impacts of release of pollutants in flood waters, flowing rivers, streams, creeks, or reservoir waters.

Policy PF-E.21 **Best Management Practices** The County shall require the use of feasible and practical best management practices (BMPs) to protect

streams from the adverse effects of construction activities, and shall encourage the urban storm drainage systems and agricultural activities to use BMPs.

4.4.3 Impacts and Mitigation Measures

Methods of Analysis

The evaluation was performed in light of current conditions in the proposed project area, applicable regulations and guidelines, and typical activities anticipated to be associated with the installation of proposed facilities. Evaluation of potential impacts to hydrologic resources, including surface water, groundwater, flooding, drainage, and water quality was based on a review of documents pertaining to the project area including FEMA flood maps and publicly available water data, water quality data, and associated information.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alternation of the course of a stream or river, in a manner which would result in substantial erosion or siltation and/or flooding on- or off-site;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place structures within a 100-year flood hazard area which could impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Inundation by seiche, tsunami, or mudflow.

For a discussion of water supply please refer to Section 4.10 Public Services and Utilities.

Impacts Not Further Evaluated

Place housing in a 100-year flood hazard area. The proposed project would not place housing in a 100-year flood hazard zone; therefore, no impact would occur and this issue will not be further evaluated in the EIR.

Place structures within a 100-year flood hazard area which could impede or redirect flood flows. The proposed project would not result in aboveground structures being placed within a FEMA-defined 100 year floodzone as shown in Figure 4.4-1. Pipelines and would be installed underground, and, once installed, would not interfere with flood flows. Therefore, no impact would occur and this issue will not be further evaluated in the EIR.

Expose people to flood risk from the failure of a levee or dam. The project would not result in the construction of new densely occupied facilities or housing within an area that is protected from flooding by a dam or levee. Additionally, the project would not result in the removal or other loss of function of a flood control levee or dam. Therefore, no impact would occur and this impact will not be further evaluated in the EIR.

Inundation by seiche, tsunami, or mudflow. It is not anticipated that Metro Plan Update would result in exposing people or structures to inundation by seiche, tsunami or mudflows, because the proposed project is not located within the vicinity of resources that could cause these events, therefore no impact would occur and this issue will not be evaluated further in the EIR.

Impacts and Mitigation Measures

Table 4.4-2 provides a summary of the impact analysis for issues related to hydrology and water quality.

TABLE 4.4-2
PROPOSED PROJECT IMPACT SUMMARY – HYDROLOGY AND WATER QUALITY

	Near-Term Project Elements		Future Project Elements	
Impact	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.4.1: Construction of the proposed project would involve activities that could result in increased amounts of sediment and construction equipment-related pollutants in storm water run-off that could adversely affect receiving water quality.	LS	NA	LS	NA
Impact 4.4.2: Implementation of the proposed project could adversely affect receiving water quality due to increased pollutants in surface runoff and/or accidental release of chemicals stored at project facilities.	LS	NA	LS	NA
Impact 4.4.3: The proposed project includes new and upgraded facilities that could reduce groundwater recharge potential and lower groundwater levels.	LS	NA	LS	NA

TABLE 4.4-2
PROPOSED PROJECT IMPACT SUMMARY – HYDROLOGY AND WATER QUALITY

Impact	Near-Term Project Elements		Future Project Elements	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Impact 4.4.4: The proposed project would include new and upgraded facilities that would increase the rate and amount of runoff which could result in localized flooding or exceed drainage system capacity.	LS	NA	LS	NA
Impact 4.4.5: Placement of proposed project facilities in a designated flood hazard zone could impede or redirect flood flows resulting in off-site flooding and could expose facilities to damage resulting from flooding.	LS	NA	LS	NA
Impact 4.4.6: Implementation of the proposed project, when combined with construction and operation of other future projects, could adversely affect surface and groundwater quality.	LS	NA	LS	NA
Impact 4.4.7: Implementation of the proposed project, when combined with implementation of other future projects, could increase rates of stormwater runoff that could exceed drainage system capacity.	LS	NA	LS	NA
Impact 4.4.8: Implementation of the proposed project, when combined with implementation of other future projects, could cumulatively contribute to increased flood elevations or redirecting or impeding flood flows increasing the risk of damage associated with flooding.	LS	NA	LS	NA

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less than Significant Impact
NA = Not Applicable

Impact 4.4.1: Construction of the proposed project would involve activities that could result in increased amounts of sediment and construction equipment-related pollutants in storm water runoff that could adversely affect receiving water quality. (Less than Significant)

Near-Term and Future Project Elements

Construction of proposed near-term and future project elements, including the proposed SWTFs and upgrades, clearwells, water transmission facilities, groundwater recharge basins, and other proposed elements, would require trenching, land clearing, site preparation, grading, earth moving, trenching and other site preparation activities. As discussed in Section 4.3, soils underlying the project area are classified as having slight to moderate erosion potential; however, earth moving activities during wet weather months could increase rates of erosion. In addition, construction would involve the use of heavy machinery which could result in the accidental release of fuels, oils, solvents, hydraulic fluid, and other construction-related fluids to the environment. During precipitation events, these and other related water quality pollutants could become entrained in stormwater flows, migrate off site, and have the potential to degrade

downstream receiving water quality. Waterways listed above could be affected during project construction, where construction activities would be scattered across the City. For major construction sites, the proposed Southeast SWTF would be located approximately 0.5 miles south of the nearest major waterway (Mill Ditch), the Northeast SWTF would be located approximately 1.5 miles southeast of the nearest major waterway (San Joaquin River). Stormwater from these facilities would drain via storm drains into the FMFCD's stormwater drainage system.

Prior to construction of all near-term and future project elements, the City would be required to obtain an NPDES General Construction Permit for Discharges of Stormwater Associated with Construction Activities (NPDES General Stormwater Permit), from the CVRWQCB. Conditions of this permit would include:

- Preparation of hazardous material spill control and countermeasure programs;
- Stormwater quality sampling, monitoring, and compliance reporting;
- Development and adherence to a Rain Event Action Plan;
- Mandatory training under a specific curriculum; and
- Mandatory implementation of BMPs, which may include, but would not be limited to:
    - Physical barriers to prevent erosion and sedimentation including setbacks and buffers, rooftop and impervious surface disconnection, rain gardens and cisterns, and other installations;
    - Construction and maintenance of sedimentation basins;
    - Limitations on construction work during storm events;
    - Use of swales, mechanical, or chemical means of stormwater treatment during construction, including vegetated swales, bioretention cells, chemical treatments, and mechanical stormwater filters; and
    - Implementation of spill control, sediment control, and pollution control plans and training.

The specific BMPs to be implemented would be determined prior to issuance of the NPDES General Permit, in coordination with the CVRWQCB. Adherence to these BMPs would be required as a condition of the permit, and would substantially reduce or prevent waterborne pollutants from entering receiving waters per CVRWQCB standards. Therefore, this impact is considered less than significant.

Mitigation (NT/F): None required.

Impact 4.4.2: Implementation of the proposed project could adversely affect receiving water quality due to increased pollutants in surface runoff and/or accidental release of chemicals stored at project facilities. (Less than Significant)

Near-Term and Future Project Elements

Operation of proposed project elements could affect water quality due to increased pollutants in surface runoff from impervious surfaces and/or accidental release of chemicals stored at project facilities (primarily SWTFs). Some of the proposed project elements would include new impervious surfaces. In particular, the proposed SWTFs would include new paved facilities areas, parking areas, and access roads. The proposed SE SWTF involves development of approximately 58 acres of developed uses. Water storage facilities would also include new impervious surfaces, including parking and access areas, and the tanks themselves. Other more minor facilities, including pump stations, groundwater wells, and other small facilities would include small amounts of new impervious surfaces. During dry periods, impervious surfaces collect dust, sediment, oils, and other pollutants. During storm events, these pollutants can become entrained in stormwater. When discharged to surface waters, pollutant-laden stormwater can degrade receiving water quality.

Potential water quality degradation from impervious surfaces would be offset via compliance with requirements of the Fresno County MS4 Permit. Adherence to permit conditions would include implementation of operation period BMPs that would be designed to minimize operation period stormwater quality degradation, to the extent warranted to maintain compliance with applicable Regional Board standards and support beneficial use. Specific BMPs to be implemented would be determined in accordance with the MS4 Permit would include structural controls, operations and maintenance requirements, monitoring, and other BMPs designed to minimize operation period water quality degradation.

Operation of the proposed SWTFs would include storage and use of chemicals for water treatment. Accidental spills of these chemicals could result in degradation of water quality, especially if the chemicals were accidentally released into the environment. As described under Impact 4.9-2 in Section 4.9, Hazards and Hazardous Materials, numerous laws and regulations govern the transport, use, storage, handling and disposal of hazardous materials to reduce the accidental release of these materials.

Adherence to the requirements of the MS4 permit for minimizing pollutants in surface runoff and to applicable regulations for the management of hazardous chemicals stored and used at proposed SWTFs would minimize potential adverse affects to receiving water quality during project operation. Therefore, this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

Impact 4.4.3: The proposed project includes new and upgraded facilities that could reduce groundwater recharge potential and lower groundwater levels. (Less than Significant)

Near-Term and Future Project Elements

Impervious surfaces prevent the infiltration of stormwater into the ground, thereby reducing groundwater recharge. The proposed project involves creating new impervious surfaces over that which currently exists, including development and expansion of SWTFs (especially the proposed 58-acre SE SWTF) and the lining of approximately 0.8 mile of Fresno Canal with gunite in order to reduce seepage under Conveyance Option 1. Reducing of seepage would result in a net reduction in groundwater recharge along the affected area of the canal. However, other portions of the canal would remain unlined. Other project elements would result in limited new impervious surfaces. As discussed in section 4.3, Geology and Soils, most of the soils underlying the proposed project area are well to exceptionally drained, and are expected to readily support groundwater recharge.

The proposed project would increase groundwater recharge capacity (20,500 af/yr additional) through the increased use of existing recharge facilities and construction and maintenance of new recharge facilities (approximately 340 acres of additional recharge area) to allow for increased recharge in years when surplus surface water is available to help restore groundwater levels to historical levels. In addition, additional intentional groundwater recharge could be achieved through the construction of expanded or new recharge basins and/or the development of an Aquifer Storage and Recovery (ASR) Well System. Therefore, while increased impervious surfaces and lining of a segment of the Fresno Canal could reduce groundwater recharge potential; this would be off-set by proposed project elements to increase recharge capacity.

In addition, the increased direct use of the City's surface water supplies, through the cooperative agreement with FID, may potentially shift some surface water use currently made available to farming operations within FID but outside the City SOI, to within the City which could affect groundwater levels. Historically, these surface water supplies were used on the agricultural lands that are now annexed within and served through the City's municipal supply system. The intent of the proposed project is to once again use these surface water supplies for the benefit of the lands that historically received these supplies and bring into balance groundwater use by 2025. As the City's urbanized area has expanded and annexed lands that were previously irrigated directly from FID supplies, FID's overall irrigated acreage has declined. FID's normal year entitlement from the Kings River -- approximately 390,000 af – has remained relatively constant. Through the proposed project, the City intends to reinitiate direct surface water use of approximately 72,000 af annually (full build out of the SE SWTF) for the benefit of former FID irrigated land now receiving City water service. The re-utilization of these surface water supplies within the City's SOI, in combination with the additional enhanced groundwater recharge associated with the proposed project, are expected to have a net negligible effect on groundwater levels within the FID service area. With project completion, the groundwater gradient is expected to stabilize beneath the City thus reducing potential influences beyond its SOI. Therefore, implementation of the proposed project is not anticipated to reduce groundwater recharge potential or lower groundwater levels and this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

Impact 4.4.4: The proposed project would include new and upgraded facilities that would increase the rate and amount of runoff which could result in localized flooding or exceed drainage system capacity. (Less than Significant)

Near-Term and Future Project Elements

Implementation of the proposed project would involve construction of various facilities such as new and upgraded SRWFs, transmission pipelines, pump stations, storage tanks and groundwater recharge facilities. Installation of these facilities would include grading, earth moving, and other minor changes in site topography that could cause changes in the location, volume, and peak discharge rates of stormwater from project facility sites. The proposed project would also include the installation of new impervious surfaces associated over that which currently exists. Impervious surfaces include concrete, asphalt, building roofs, and other proposed facilities that do not permit the infiltration of stormwater into underlying soils. As a result, the volume, location, and peak discharge rate of stormwater runoff during precipitation events can increase or be altered. This situation could potentially result in increased stormwater and flood flows along existing stormwater/flood control facilities, and could thereby cause or contribute to increases in flooding downstream.

The largest areas of new near-term impervious surfaces would be at the proposed SE SWTF and the upgrades to the NE SWTF. The SE SWTF would be located in an area that is not presently developed. Under existing conditions, drainage at the Southeast SWTF site is provided by agricultural drainages and ditches that connect to the regional drainage system. Additional drainage infrastructure is, however, proposed for the area under FMFCD's Storm Drainage and Flood Control Master Plan for Fresno County, which shows a proposed stormwater detention basin and proposed pipelines in the vicinity of the proposed SE SWTF. The NE SWTF is drained by a combination of existing local storm drain pipelines and drainage channels/canals that are operated by FMFCD. Updates at the NE SWTF would expand the existing facility, which would continue to be served by FMFCD's existing drainage system.

The largest areas of new future impervious surfaces would be at the proposed SW SWTF. The SW SWTF would be located in an area that is not presently developed. Under existing conditions, drainage at the SW SWTF site is provided by agricultural drainages and ditches that connect to the regional drainage system. Similar to the SE SWTF, storm drainage infrastructure is proposed in the vicinity as part of the FMFCD's Storm Drainage and Flood Control Master Plan.

Each individual project implemented under the proposed Metro Plan Update that would result in the construction of new aboveground facilities (SWTFs, etc.) would be required to complete payment of fees in order to support the completion of additional stormwater control facilities, as described in the Storm Drainage and Flood Control Master Plan. Implementation of additional stormwater control facilities or other modifications, pursuant to the Storm Drainage and Flood Control Master Plan, have been evaluated separately, and would be implemented under the

oversight of the FMFCD. As specified in the Storm Drainage and Flood Control Master Plan, storm runoff from new project sites would be controlled via a system of stormwater pipelines and storm drainage detention basins. Prior to construction of individual projects under the proposed project, the City would be required to submit proposed construction plans to the FMFCD for approval. The FMFCD would ensure that the proposed construction would conform to the Storm Drainage and Flood Control Master Plan prior to initiation of construction activities. Additionally, any proposed modifications or changes to the existing stormwater drainage system, including any proposed grading changes to that system, would also require review and approval by the FMFCD prior to project construction. Adherence to these existing requirements would ensure that implementation of projects in the Metro Plan Update would not cause changes in stormwater flows that exceed drainage system capacity. Therefore, this impact would be less than significant.

Mitigation (NT/F): None required.

Impact 4.4.5: Placement of proposed project facilities in a designated flood hazard zone could impede or redirect flood flows resulting in off-site flooding and could expose facilities to damage resulting from flooding. (Less than Significant)

Near-Term Project Elements

As shown in Figure 4.4-1, no near-term project element aboveground structures (SE SWTF, expanded NE SWTF) would be constructed in a FEMA-defined 100 year floodzone; and therefore, would not impede or redirect flood flows.

Future Project Elements

Based on available information, aboveground future project elements would be installed outside of 100-year flood zones. However, the precise location of some future project elements has not yet been determined and they could be located in a flood hazard zone. Transmission pipelines and some other facilities would be installed underground, and, once installed, would not interfere with flood flows or be subject to potential damage. However, aboveground facilities placed in a 100-year flood zone could interfere with flood flows, potentially causing increased flooding in neighboring areas. This could include tanks, as well as groundwater recharge basins, if these basins would include levees or berms to maintain water levels for infiltration. However, adherence to the Fresno Flood Plain Ordinance would minimize potential flood related impacts. As described previously, in order to obtain building permits for any proposed facility under the proposed Metro Plan Update, a potential project would be required to comply with the requirements of the Fresno Flood Plain Ordinance. Requirements include minimization of construction within natural floodplains and existing flood barriers; limits on fill, grading, and other activities that could cause increased flood damage; restriction or prevention of the use of artificial flood control barriers, and implementation of protection measures for proposed facilities that would be located within special flood hazard areas. Compliance with these requirements would ensure that individual facilities proposed under the proposed project would minimize potential for damage associated with flood flows, and would also minimize potential for interference with flood flows and

associated changes in flooding patterns off site. Therefore, this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

The cumulative context for cumulative hydrology and water quality resource impacts is the Kings Subbasin of the San Joaquin Valley Groundwater Basin. Because the proposed project involves groundwater recharge, it is anticipated that it would not make a considerable contribution to a potential loss of groundwater recharge potential and would not lower groundwater levels.

Impact 4.4.6: Implementation of the proposed project, when combined with construction and operation of other future projects, could adversely affect surface and groundwater quality. (Less than Significant)

Near-Term and Future Project Elements

Implementation of the proposed project in combination with the construction and operation of other projects that would contribute runoff to the same receiving waters could degrade water quality. Erosion, and sediment loading attributed to construction site runoff would be required to comply with NPDES General Construction Permit requirements for development and implementation of BMPs. Similarly, potential water quality degradation from impervious surfaces would be offset via compliance with requirements of the Fresno County MS4 Permit. Adherence to permit conditions would include implementation of operation period BMPs. As a result, compliance with regulatory requirements (NPDES permit requirements) minimize potential adverse affects to surface and groundwater quality. This is considered a less-than-significant cumulative impact.

Mitigation (NT/F): None required.

Impact 4.4.7: Implementation of the proposed project, when combined with implementation of other future projects, could increase rates of stormwater runoff that could exceed drainage system capacity. (Less than Significant)

Near-Term and Future Project Elements

Implementation of the proposed project, combined with other future projects would include the installation of new impervious surfaces. Impervious surfaces include concrete, asphalt, building roofs, and other proposed facilities that do not permit the infiltration of stormwater into underlying sediments. As a result, the volume, location, and peak discharge rate of stormwater runoff during precipitation events can increase or be altered. This situation could potentially result in increased stormwater and flood flows along existing stormwater/flood control facilities, and could thereby cause or contribute to a significant cumulative increases in flooding downstream.

However, individual projects in the City of Fresno, including the proposed project, would be required to complete payment of fees in order to support the completion of additional stormwater control facilities, as described in the Storm Drainage and Flood Control Master Plan. Implementation of additional stormwater control facilities or other modifications, pursuant to the Storm Drainage and Flood Control Master Plan, have been evaluated separately, and would be implemented under the oversight of the FMFCD. As specified in the Storm Drainage and Flood Control Master Plan, storm runoff from new project sites would be controlled via a system of stormwater pipelines and storm drainage detention basins. Prior to construction of individual projects, project sponsors would be required to submit proposed construction plans to the FMFCD for approval. The FMFCD would ensure that the proposed construction would conform to the Storm Drainage and Flood Control Master Plan prior to initiation of construction activities. Additionally, any proposed modifications or changes to the existing stormwater drainage system, including any proposed grading changes to that system, would also require review and approval by the FMFCD prior to project construction. Adherence to these existing requirements would ensure that projects would not cause changes in stormwater flows that exceed drainage system capacity. Therefore, this cumulative impact would be less-than-significant.

Mitigation (NT/F): None required.

Impact 4.4.8: Implementation of the proposed project, when combined with implementation of other future projects, could cumulatively contribute to increased flood elevations or redirecting or impeding flood flows increasing the risk of damage associated with flooding. (Less than Significant)

Future projects, including facilities implemented under the proposed Metro Plan Update, could site facilities in a designated flood hazard zone which could cumulatively contribute to increased flood elevations or redirecting or impeding flood flows which could increase the risk of damage associated with flooding. However, adherence to the Fresno Flood Plain Ordinance would minimize potential flood related impacts. As described previously, in order to obtain building permits for any proposed facility, a potential project would be required to comply with the requirements of the Fresno Flood Plain Ordinance. Requirements include minimization of construction within natural floodplains and existing flood barriers; limits on fill, grading, and other activities that could cause increased flood damage; restriction or prevention of the use of artificial flood control barriers, and implementation of protection measures for proposed facilities that would be located within special flood hazard areas. Compliance with these requirements would ensure that individual facilities, including those proposed under the proposed project, would minimize potential for damage associated with flood flows, and would also minimize potential for interference with flood flows and associated changes in flooding patterns off site. Therefore, this is considered a less-than-significant cumulative impact.

Mitigation (NT/F): None required.

4.5 Biological Resources

The following section describes the biological resources and natural communities occurring within the proposed project area, and potential impacts to these resources that may result from implementation of the Metro Plan. Mitigation measures are identified, where appropriate, that address potential impacts to biological resources. Biological resources may include potentially occurring special-status species, wildlife habitats, vegetation communities, and jurisdictional waters of the U.S. This evaluation of biological resources includes a review of pertinent literature, existing information, database queries, and reconnaissance-level field surveys conducted on July 21 through July 23, 2010, December 1, 2011, and October 23, 2013.

The sources of reference data reviewed for this section included the following:

- California Natural Diversity Database (CNDDB), Rarefind 4 electronic database (California Department of Fish and Wildlife [CDFW][1], 2013) (Appendix C);
- California Native Plant Society (CNPS) Inventory of Rare Plants- online edition, version 7-13Oct (CNPS, 2013) (Appendix D);
- Ecological Subregions of California (Miles & Goudy, 1997);
- U.S. Fish and Wildlife Service (USFWS) list of Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Friant, Fresno North, Clovis, Round Mountain, Piedra, Fresno South, Malaga, Sanger, and Wahtoke USGS 7.5-Minute Topographic Quadrangles (USFWS, 2013) (Appendix E); and
- California Wildlife Habitat Relationships System (CWHR) Habitat Mapping and Descriptions (Mayer and Laudenslayer, 1988).

Comments received in response to the NOP included those associated with potential birdstrike hazards at the Fresno Yosemite International Airport and the Chandler Executive Airport. Potential birdstrike hazards are addressed in Section 4.9, Hazards and Hazardous Materials. See Appendix B for NOP comment letters.

4.5.1 Environmental Setting

The proposed project area is located in the south central region of the San Joaquin Valley, which is the larger southern subregion of the Great Central Valley ecological region (Miles and Goudy, 1997). The Great Central Valley of California is a vast, flat, low-lying plain almost entirely surrounded by mountains. The valley parallels the general north-south trend of the Sierra Nevada on the east and the California Coast Ranges on the west. The northern half of the Great Central Valley is known as the Sacramento Valley, and the southern half is known as the San Joaquin Valley. The proposed project is located in the south central San Joaquin Valley within basin-type physiography. Basins are common in the San Joaquin Valley, and are commonly

[1] It should be noted that as of January 1, 2013 the California Department of Fish and Game changed its name to the California Department of Fish and Wildlife; however the name change did not extend to the Code which remains the California Department of Fish and Game Code. All references prior to 2013 will remain as California Department of Fish and Game or CDFG.

associated with hardpans and high clay content. The climate is hot and subhumid with mean annual precipitation (primarily occurring as rain) is about 8 to 10 inches. Mean annual temperature is about 59 to 62 degrees Fahrenheit. The mean freeze-free period is about 250 to 275 days (Miles and Goudy, 1997).

Historically, this region supported extensive annual grasslands intermixed with a variety of vegetative communities including oak woodland, wetland, and riparian woodland. Intensive agricultural and urban development has resulted in large losses and conversion of these communities. The remaining native vegetative communities exist as isolated remnant patches within urban, suburban and agricultural landscapes, or in areas where varied topography has made urban and/or agricultural development difficult. Elevations within the project area range between 305 and 428 feet.

Wildlife Habitats and Vegetation Communities

Wildlife habitats are classified using the CDFW's *A Guide to Wildlife Habitats* (Mayer and Laudenslayer, 1988). Wildlife habitats generally correspond to vegetation or plant communities. Plant communities are assemblages of plant species that occur together in a given area and are defined by species composition and relative abundance. The proposed project area supports several habitat types: Agriculture; Annual Grassland; Barren; Wetlands (including Freshwater Emergent Wetland),Lacustrine; Open Water; Urban; and Valley Foothill Riparian. Habitat mapping (Figure 4.5-1) and descriptions are based from the CWHR (Mayer and Laudenslayer, 1988). Table 4.5-1 provides estimated acreages of habitats found within the proposed project area.

TABLE 4.5-1
PROPOSED PROJECT AREA HABITATS/VEGETATION COMMUNITIES

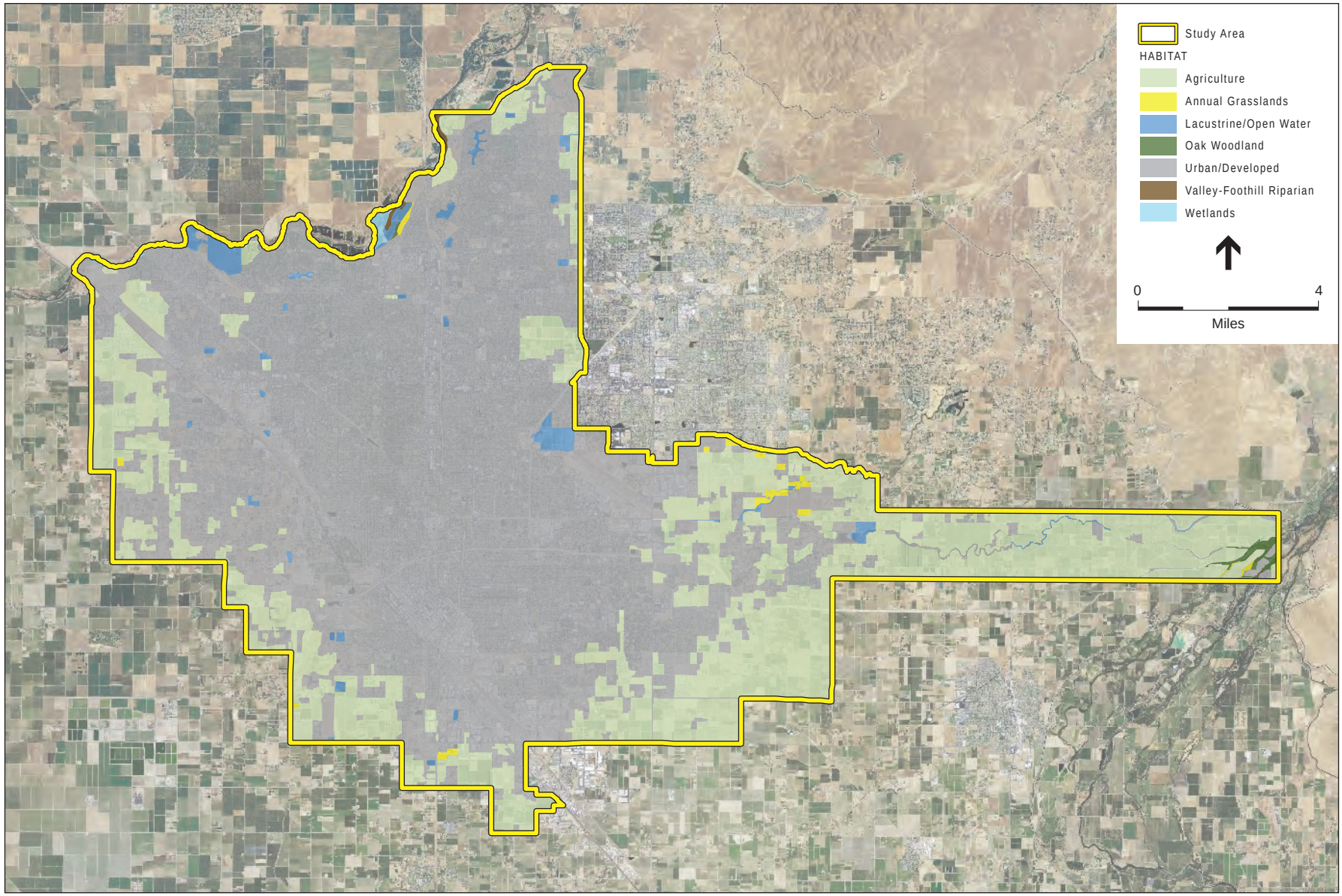
Habitat Type	Acres
Agriculture	32,541
Annual Grassland	386
Barren	74
Urban	77,578
Valley Foothill Riparian	148
Wetlands	377
Lacustrine/Open Water	1,663
Total	**112,767**

SOURCE: CWHR, 2010

Upland Plant Communities and Habitats

Agriculture

Agricultural habitats include a variety of crops ranging in size, shape, and growing patterns. Although most crops are planted in rows, alfalfa hay and small grains (rice, barley, and wheat) may form dense stands with up to 100 percent canopy closure. Most croplands are planted with



SOURCE: ESRP, 2004; City of Fresno, 2009; West Yost, 2009; USDA, 2012; ESA, 2013

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Figure 4.5-1
Habitats in the Proposed Project Area

annuals that are planted in the spring and harvested during the summer or fall. Typical types of agriculture found within the project area include orchard, vineyard, and row crops. Primary crops observed within areas encompassing near-term project elements include citrus, almond, walnut, vineyards, vegetable row crops, alfalfa, among others. Agriculture occurs primarily in areas outside of the City limits (Fresno SOI and unincorporated areas).

Annual Grassland

Annual grassland generally occurs in open areas in valleys and foothills throughout coastal and interior California. This vegetation type is dominated by nonnative Mediterranean annual grasses such as wild oats (*Avena* sp.), soft chess (*Bromus hordeaceus*), and ripgut brome (*Bromus diandrus*). Forbs occurring in annual grassland include spring vetch (*Vicia sativa*), redstem filaree (*Erodium cicutarium*), longbeak filaree (*E. botrys*), and bur clover (*Medicago polymorpha*). Wildlife such as western fence lizard (*Sceloporus occidentalis*), field mouse (*Peromyscus maniculatus*), California vole (*Microtus californicus*), and black-tailed jackrabbit (*Lepus californicus*) commonly occur in annual grassland habitat. Within the project area, this habitat type occurs in association valley foothill riparian. It also intergrades with a variety of other habitats, including agriculture, barren, urban, and riverine.

Barren

Barren habitat is defined by the absence of vegetation. Specifically, barren habitat is composed of <2 percent total vegetation cover by herbaceous, desert, or non-wildland species and <10 percent cover by tree or shrub species. Structure and composition of the subtrate is largely determined by the region of the state and surrounding environment. Barren habitat provides limited opportunities for wildlife; however, certain species are known to use barren (gravelly) habitat, including killdeer (*Charadrius vociferus*). Within the project area, barren habitat occurs in association with or intergrades into agriculture, urban, annual grassland, and riverine habitats.

Urban

Although urban is not a true habitat type, it is discussed in this report because it composes a large portion of the proposed project area. The structure of urban vegetation varies depending on locale (e.g., downtown, urban residential, and suburbia) and includes tree groves, street tree strips, shade trees, lawn, and shrub cover. Urban environments generally provide limited habitat for common wildlife species such as rock pigeon, house sparrow, American crow (*Corvus brachyrhynchos*), house mouse (*Mus musculus*), and opossum (*Didelphis virginiana*). Within the project area, urban habitat occurs primarily within the City of Fresno and decreases in density in the City's SOI and in unincorporated areas.

Valley Foothill Riparian

Valley foothill riparian typically consists of mature riparian forest with a subcanopy tree layer and an understory shrub layer. Dominant species in the canopy are typically cottonwood, California sycamore (*Platanus racemosa*) and valley oak (*Quercus lobata*). Subcanopy trees are white alder (*Alnus rhombifolia*), box elder (*Acer negundo*), and Oregon ash (*Fraxinus latifolia*). Typical understory shrub layer species include wild grape (*Vitis californica*), wild rose (*Rosa californica*),

California blackberry (*Rubus ursinus*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), poison oak (*Toxicodendron diversilobum*), buttonbush (*Cephalanthus occidentalis*), and willows (*Salix* sp.).

Depending on habitat complexity and structure, valley foothill riparian may provide cover, nesting, and dispersal habitat for a wide variety of wildlife, including amphibians, reptiles, mammals, and many bird species. Additionally, trees and shrubs growing along the banks of a channel provide shade for the water column adjacent to the stream bank and deposit insects and nutrients into the water. Over-hanging vegetation provides shaded riverine aquatic habitat for fish and other aquatic wildlife. Species observed within this habitat during the site visit include acorn woodpecker (*Melanerpes formicivorus*), black phoebe (*Sayornis nigricans*), and American crow (*Corvus brachyrhynchos*).

Within the areas encompassing near-term project elements, valley foothill riparian habitat occurs in thin, fragmented bands along the Fresno Canal. Characteristic species that comprise the upperstory include valley oak, black willow (*Salix gooddingii*), arroyo willow (*Salix lasiolepis*), and eucalyptus (*Eucalyptus* sp.); the understory consists of sandbar willow (*Salix exigua*), Himalayan blackberry (*Rubus armeniacus*), California blackberry, and elderberry (*Sambucus* sp.). In some areas along the canal, the understory is comprised of annual grassland species and lack significant woody vegetation. Dense or well developed riparian habitat specifically occurs along the eastern segments of the Fresno Canal, in the vicinity of the proposed intake/diversion structure, canal lining, and canal dredging locations. However, fragmented riparian stands also occur along several portions of the proposed year-round maintenance road.

Aquatic Plant Communities and Habitats

Wetlands and Other Waters of the U.S.

Wetlands are ecologically complex habitats that support a variety of both plant and animal life. In a jurisdictional sense, the federal government defines wetlands in Section 404 of the CWA as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support (and do support, under normal circumstances) a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3[b] and 40 CFR 230.3). Under normal circumstances, the federal definition of wetlands requires three wetland identification parameters be present: 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 other waters of the U.S. (see definition below for "other waters of the U.S."). The Corps is the responsible agency for regulating wetlands under Section 404 of the CWA, while the EPA has overall responsibility for the CWA. The CDFW does not normally have direct jurisdiction over wetlands unless they are subject to jurisdiction under Streambed Alteration Agreements or they support state-listed endangered species; however, CDFW has trust responsibility for wildlife and habitats pursuant to California law.

"Other waters of the U.S." refers to those hydric features that are regulated by the Clean Water Act but are not wetlands (33 CFR 328.4). To be considered jurisdictional, these features must exhibit a defined bed and bank and an ordinary high-water mark. Examples of other waters of the U.S. include rivers, creeks, intermittent and ephemeral channels, ponds, and lakes.

Wetlands or other water features that may be regulated under federal or State authority have the potential to occur in the proposed project area. These may include but are not limited to agricultural irrigation channels and the Fresno Canal within areas that encompass near-term project elements. Ponding was observed on the banks of an overflow basin during field reconnaissance conducted in 2009 at the NE SWTF; however, due to the nature of the feature it is not likely to be considered jurisdictional.

Freshwater Emergent Wetland

Freshwater emergent wetland typically occurs in low-lying sites that are saturated, periodically flooded, or permanently flooded with fresh water and lacking significant current. This habitat type is characterized by erect, rooted herbaceous hydrophytes (water-loving plants) that thrive in an anaerobic environment. This vegetation community characteristically forms a dense vegetative cover dominated by perennial, emergent monocots one to 15 feet high that reproduce by underground rhizomes. Freshwater emergent wetlands provide food, cover, and water for numerous species of birds, mammals, reptiles, and amphibians, many of which depend on these wetlands throughout their life cycle. Freshwater emergent wetland and occurs in limited size and extent within the project area. Within areas encompassing near-term project elements, freshwater emergent wetland occurs at the NE SWTF and sporadically along the margins of the Fresno Canal (as part of Riverine habitat).

Lacustrine

Lacustrine habitats are inland depressions or dammed riverine channels containing standing water and vary in size and depth. It often occurs in association with many terrestrial habitats as well as riverine and freshwater emergent wetland habitats. A variety of mammals, birds, reptiles, and amphibians use lacustrine habitat for reproduction, food, water and cover. Within areas that encompass near-term project elements, lacustrine habitat includes groundwater recharge ponds and detention basins.

Open Water (Riverine)

Riverine habitat is distinguished by intermittent (seasonal) or perennial (continually flowing) stream channels. Riverine habitat within areas encompassing near-term project elements is highly modified and occurs in the form of concrete and dirt lined irrigation canals. The Fresno Canal is the most prominent riverine feature within the project area; it has direct connectivity to the Kings River. Most agricultural canals, including a large portion of the Fresno Canal are mostly void of vegetation. However, some segments of the Fresno Canal, particularly the eastern portions, contain emergent wetland and riparian vegetation within the channel and along its banks. Riverine habitat present within the project are does not provide suitable habitat for special-status fish species.

Special-Status Species

Special-status species are plants and animals that are legally protected under California and Federal Endangered Species Acts (ESA) or other regulations and species that are considered sufficiently rare by the scientific community to qualify for such listing. These species are in the following categories:

- Plants or animals listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.12 [listed plants], 17.11 [listed animals] and various notices in the Federal Register [FR] [proposed species]).
- Plants or animals that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40, February 28, 1996);
- Plants or animals listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 California Code of Regulations [CCR] 670.5);
- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.);
- Plants that meet the definitions of rare and endangered under the California Environmental Quality Act (CEQA). CEQA section 15380 provides that a plant or animal species may be treated as "rare or endangered" even if not on one of the official lists (State CEQA Guidelines, section 15380);
- Plants considered under the California Native Plant Society (CNPS) to be "rare, threatened or endangered in California" (Lists 1A, 1B, and 2 in CNPS 2008);
- Plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in CNPS 2008), which may be included as special-status species on the basis of local significance or recent biological information;
- Animal species of special concern to CDFW; and
- Animals fully protected in California (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

A list of special-status plant and animal species that have the potential to occur within the vicinity of the proposed project area was compiled based on data in the CNDDB (CDFW, 2013), CNPS Inventory of Rare and Endangered Plants (CNPS, 2013), and the USFWS List of Federal Endangered and Threatened Species that may be affected by Projects in the Friant, Fresno North, Clovis, Round Mountain, Piedra, Fresno South, Malaga, Sanger, and Wahtoke 7.5-minute topographic quadrangles (USFWS, 2013). These species lists are found in Appendix E.

The "Potential for Occurrence" category is defined as follows:

- Unlikely: The project site and/or surrounding area do not support suitable habitat for a particular species, or the project site is outside of the species known range.
- Low Potential: The project site and/or immediate area only provide limited amounts and low quality habitat for a particular species. In addition, the known range for a particular species may be outside of the immediate project area.
- Medium Potential: The project site and/or immediate area provide suitable habitat for a particular species.
- High Potential: The project site and/or immediate area provide ideal habitat conditions for a particular species and/or known populations occur in immediate area and/or within the project site.

Conclusions regarding habitat suitability and species occurrence are based on the review of existing literature and databases as well as reconnaissance surveys. Table 4.5-2 lists special-status plants and animals with the potential to occur within the proposed project area. Figure 4.5-2 identifies the locations of regional CNDDB occurrences.

TABLE 4.5-2
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in the Study area
Invertebrates			
Branchinecta conservatio Conservancy fairy shrimp	FE/--/--	Found in ephemeral freshwater habitats including alkaline pools, clay flats, vernal pools, vernal lakes, vernal swales, and other types of seasonal wetlands.	Low. The study area is within the species' known range but suitable habitat is not present in the study area.
Branchinecta lynchi vernal pool fairy shrimp	FT/--/--	Found in ephemeral freshwater habitats including alkaline pools, clay flats, vernal pools, vernal lakes, vernal swales, and other types of seasonal wetlands.	Low. The study area is within the species' known range but suitable habitat is not present in the study area. Species known to occur within five miles of the study area. The nearest occurrences were mapped near the Friant-Kern Canal, approximately one mile north of the proposed canal dredging element of the project (CDFW, 2013).
Branchinecta mesovallensis midvalley fairy shrimp	--/--/--	Found in shallow vernal pools, vernal swales, and various artificial ephemeral wetland habitats.	Low. The study area is within the species' known range but suitable habitat is not present in the study area. Species known to occur within five miles of the study area in the vicinity of Little Dry Creek, approximately three miles northeast of the existing NE SWTF (CDFW, 2013).
Calicina dimorphica Watts Valley harvestman	--/--/--	Known only from the northeast entrance to Watts Valley, in Fresno County.	Unlikely. Species known from only one occurrence in Fresno County in Watts Valley.
Calicina messaensis Table Mountain harvestman	--/--/--	Known only from Table Mountain, in Fresno County.	Unlikely. Species known from only one occurrence in Fresno County on Table Mountain.
Chrysis tularensis Tulare cuckcoo wasp	--/--/--	Known only from Wonder Valley, in Fresno County.	Unlikely. Species known from only one occurrence in Fresno County in Wonder Valley.
Desmocerus californicus dimorphus valley elderberry longhorn beetle	FT/--/--	Breeds and forages exclusively on elderberry shrubs (*Sambucus* sp.) typically associated with riparian forests, riparian woodlands, elderberry savannas, and other Central Valley habitats. Occurs only in the Central Valley of California. Prefers to lay eggs in elderberries 2–8 inches in diameter; some preference shown for "stressed" elderberries.	**High**. Suitable habitat is present within the study area along the Fresno Canal. Species known to occur within five miles of the study area. The nearest occurrences were recorded along the Kings River and in the vicinity of the San Joaquin River along Highway 41 north of Lanes Bridge (CDFW, 2013). These occurrences are approximately 1.5 miles from the proposed project study area.
Efferia antiochi Antioch efferian robberfly	--/--/--	Known from Contra Costa and Fresno Counties.	Low. Species was last collected and observed in at Scout Island, near the San Joaquin River. Another occurrence was recorded in 1954; however, the species is not likely found at this location due to development. The species has not been observed in the study area.
Lepidurus packardi vernal pool tadpole shrimp	FE/--/--	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	Unlikely. Suitable habitat is not present within the study area. Nearest occurrences are recorded at Big Table Mountain and at the Sand Creek Conservation Bank (CDFW, 2013).
Linderiella occidentalis California linderiella	--/--/--	Found in ephemeral freshwater habitats including alkaline pools, clay flats, vernal pools, vernal lakes, vernal swales, and other types of seasonal wetlands.	Low. The study area is within the species' known range but suitable habitat is not present in the study area. Species known to occur within five miles of the study area; however, all occurrences are at least four miles away from the study area (CDFW, 2013).

TABLE 4.5-2
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in the Study area
Lytta moesta moestan blister beetle	--/--/--	Unknown.	Unlikely. Species was observed in Friant; however, it is possibly extirpated. The species has not been observed in the study area.
Lytta molesta molestan blister beetle	--/--/--	Inhabits the Central Valley of California, from Contra Costa to Kern and Tulare Counties. Common in dry vernal pools, but absent from adjacent green/flowering, non-vernal pool vegetation.	Unlikely. Suitable habitat is not present within the study area.
Metapogon hurdi *Hurd's metapogon robberfly*	--/--/--	Known only from Antioch and Fresno. No other collection information available.	Unlikely. One observation in Fresno; however, individual(s) at this location is possibly extirpated (CDFW, 2013).
Oravelia pege Dry Creek cliff strider bug	--/--/--	Known only from Dry Creek in Fresno County. Found in cracks and crevices of a sheer rocky cliff moistened by seeping water and under debris at the base of the cliff.	Unlikely. Suitable habitat is not present within the study area.
Talanites moodyae Moody's gnaphosid spider	--/--/--	Serpentine endemic.	Unlikely. Suitable habitat is not present within the study area.
Fish			
Hypomesus transpacificus Delta smelt	FT/ST/--	Open surface waters in the Sacramento/San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Found in Delta estuaries with dense aquatic vegetation and low occurrence of predators. May be affected by downstream sedimentation.	Unlikely. Project study area is located outside of the species' range.
Mylopharodon conocephalus hardhead	--/CSC/--	Found in small to large streams in a low to mid-elevation environments. May also inhabit lakes or reservoirs. Known to the San Joaquin River and its tributaries upstream of the Friant Dam. Clear, deep pools with sand-gravel-boulder bottoms & slow water velocity.	Low. Suitable habitat is not present in the study area.
Oncorhynchus mykiss Steelhead - Central Valley ESU	FT/--/--	This ESU enters the Sacramento and San Joaquin Rivers and their tributaries from July to May; spawning from December to April. Young move to rearing areas in and through the Sacramento and San Joaquin Rivers, Delta, and San Pablo and San Francisco Bays.	Unlikely. Suitable habitat is not present in the study area.
Amphibians			
Ambystoma californiense California tiger salamander (central population)	FT/CT/--	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Needs underground refuges and vernal pools or other seasonal water sources.	Low. Limited suitable habitat is present within the study area and numerous occurrences were recorded within five miles of the study area (CDFW, 2013). However, most of the recorded occurrences are extirpated or possibly extirpated, or are located in the vicinity of the Friant Dam and Millerton Lake (CDFW, 2013).
Rana aurora draytonii California red-legged frog	FT/CSC/--	Breeds in slow moving streams, ponds, and marshes with emergent vegetation; forages in nearby uplands within about 200 feet.	Low. Study area is within species' known range but provides limited suitable habitat. Species not known to occur within 5 miles of the study area (CDFW, 2013).

TABLE 4.5-2
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in the Study area
Rana boylii foothill yellow-legged frog	--/CSC/--	Requires partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Species needs at least some cobble-sized substrate for egg-laying and available suitable habitat for at least 15 weeks to attain metamorphosis.	Low. Suitable habitat occurs in limited amounts within the study area (certain segments of the Fresno Canal). The species is known to occur in Watts Creek, approximately 15 miles northeast from the project study area (CDFW, 2013).
Spea hammondii Western spadefoot	--/CSC/--	Occurs seasonally in grasslands, prairies, chaparral, and woodlands, in and around wet sites. Breeds in shallow, temporary pools formed by winter rains. Takes refuge in burrows.	Low. Study area is within species' known range but provides limited suitable habitat. Species is known to occur within five miles of the study area. Clusters of occurrences are located 1.6 miles north of the NE SWTF and 3.5 miles north of the Fresno Canal (CDFW, 2013).
Reptiles			
Emys marmorata western pond turtle	--/CSC/--	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	**High.** Study area contains suitable habitat within the Fresno Canal. A pond turtle was observed within the canal during site reconnaissance; however, the species was not identified. CNDDB recorded occurrence within 5 miles of the study area in Wahtoke Creek and in the vicinity of the Friant-Kern Canal. These occurrences are at least 4.5 miles from the study area (CDFW, 2013).
Gambelia sila blunt-nosed leopard lizard	FE/CE/--	Found in semiarid grasslands, alkali flats, and washes. Prefers flat areas with open space for running, avoiding densely vegetated areas. Found below 2,600 feet in elevation.	Unlikely. Species is not known to occur in the vicinity of Fresno.
Thamnophis gigas giant garter snake	FT/CT/--	Found primarily in marshes, sloughs, drainage canals, and irrigation ditches, especially around rice fields, and occasionally in slow-moving creeks in California's interior.	Low. Study area is within species' known range and the study area contains limited suitable habitat within the Fresno Canal. However, the nearest CNDDB recorded occurrence is from 1976 and is located 23 miles southwest of the study area in the Fresno Slough (CDFW, 2013).
Birds			
Agelaius tricolor tricolored blackbird	--/CSC/--	Largely endemic to California, most numerous in the Central Valley and nearby vicinity. Typically requires open water, protected nesting substrate, and foraging grounds within vicinity of the nesting colony. Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water. Also nests in agricultural crops (e.g. silage), where colonies are threatened during harvest.	**Moderate.** Study area is within species' known range and limited suitable habitat occurs within the study area in sections of the Fresno Canal. Species is known to occur within 5 miles of the study area (CDFW, 2013). Extant occurrences are recorded approximately 2.6 miles north of the Fresno Canal.
Aquila chrysaetos golden eagle	--/CFP/--	Found in rolling foothills, mountain areas, sage-juniper flats, and desert. Nesting habitat consists of cliff-walled canyons and large trees in open areas.	Low. The study area contains limited suitable habitat for this species. The nearest CNDDB recorded occurrence is located more than 20 miles northeast of the study area (CDFW, 2013).
Athene cunicularia burrowing owl	--/CSC/--	Found in open grasslands with low vegetation, golf courses, and disturbed/ruderal habitat in urban areas.	**Moderate.** The study contains suitable habitat for this species. CNDDB recorded occurrence within 5 miles of the study area (CDFW, 2013). The nearest occurrence was recorded southeast of Round Mountain, approximately 3.5 miles north of the Fresno Canal.

TABLE 4.5-2
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in the Study area
Buteo swainsoni Swainson's hawk	--/CT/--	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees.	**Moderate**. The study area contains suitable habitat for this species. However, the nearest CNDDB recorded occurrences are located more than 15 miles north of the study area (CDFW, 2013).
Coccyzus americanus occidentalis western yellow-billed cuckoo	FC/SE/--	Found in willow-cottonwood riparian forests in isolated areas of the Sacramento Valley.	Unlikely. CNDDB Occurrence within the study area is from 1902 (CDFW, 2013). Species is presumed extirpated.
Eremophila alpestris actia California horned lark	--/--/--	Found in prairies, fields, airports, shores, tundra. Inhabits open ground, generally avoiding areas with trees or even bushes.	**Moderate.** Study area may provide suitable habitat. One CNDDB recorded occurrence approximately 2 miles from the study area located north of Lanes Bridge on the San Joaquin River (CDFW, 2013).
Falco mexicanus prairie falcon	--/--/--	Inhabits dry, open terrain, either level or hilly. Breeding sites are located on cliffs. Species forages far afield, even to marshlands and ocean shores.	Unlikely. There is no suitable breeding habitat within the study area. No CNDDB recorded occurrences within 5 miles of the study area (CDFW, 2013).
Mammals			
Antrozous pallidus pallid bat	--/CSC/--	Favors rocky outcrops with desert scrub, but commonly ranges up to forested areas with oak and pine. Roosts in caves, rock crevices, mines, hollow trees, and buildings. Maternity colonies form in rock crevices, in buildings, and other man-made structures.	Low. Study area may provide marginal habitat within hollow trees, buildings, and other man-made structures. Species known to occur within one mile of the study area, in the vicinity of 1st Street and Grant Avenue in Fresno. The species is presumed extant at this location but the observation was made in 1909 (CDFW, 2013).
Dipodomys nitradoides exilis Fresno kangaroo rat	FE/CE/--	Found in sparse grassland and open scrub communities in Fresno County. Most populations are considered extant other than populations at the Alkali Sink Ecological Reserve west of Fresno. Species occurs at 165-2,625 feet in elevation.	Low. Study area may provide suitable habitat for this species. Species recorded to occur within 5 miles of the study area; however, both observations are extirpated or presumed extirpated (CDFW, 2013).
Euderma maculatum spotted bat	--/CSC/--	Typically found in dry, desert areas. Roosts in crevices, caves, houses, and around water.	Low. Study area may provide marginal habitat. No recorded occurrences within 5 miles of the study area.
Eumops perotis californicus Western mastiff bat	--/CSC/--	Typically found in rocky cliff and canyon areas. Roosts in crevices and occasionally buildings, caves, tunnels, and hollow trees.	**High.** Study area may provide suitable habitat. CNDDB recorded occurrences within and near the study area (CDFW, 2013).
Lasiurus cinereus hoary bat	--/--/--	Typically found in both deciduous and coniferous forests, as well as desert canyons. Generally roosts in dense foliage of medium to large trees.	**Moderate**. Study area may provide suitable habitat for this species. Species known to occur within 5 miles of the study area near California Avenue and Valentine Street (CDFW, 2013). Species may be found migrating through the study area.
Perognathus inornatus inornatus San Joaquin pocket mouse	--/--/--	Occurs in dry, open grasslands or scrub areas on fine-textured soils in the Central and Salinas valleys. Occurs between 1100-2000 feet in elevation.	Low. The study area is located outside of the species' elevation range. Species known to occur within one mile of the study area (CDFW, 2013).
Taxidea taxus American badger	--/CSC/--	Found in dry, open grasslands, fields, and pastures.	**Moderate**. Study area may provide marginal habitat. CNDDB recorded occurrence within 3 miles of the study area just west of the intersection of Herndon Avenue and Santa Fe railroad tracks and at Sunnyside Avenue in South Clovis (CDFW, 2013).

TABLE 4.5-2
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in the Study area
Vulpes macrotis mutica San Joaquin kit fox	FE/CT/--	Found in grassland, scrubland, wetlands, agricultural, and urban habitats in the San Joaquin Valley.	**Moderate.** Study area may provide suitable habitat. CNDDB recorded occurrences within 5 miles of the study area (CDFW, 2013). Nearest occurrences are located 2-2.5 miles from the study area, in Tivy Valley (southeast of the Kings River), Herndon (1 mile southeast of Grantland Avenue), and in Sanger.
Plants			
Atriplex minuscula lesser saltscale	--/--/1B.1	Found in chenopod scrub, playas, and valley and foothill grassland. Typically occurs in alkali sink and grassland in sandy, alkaline soils from 65-328 feet in elevation. Blooms May-October.	Low. Study area may provide marginal habitat. No CNDDB recorded occurrences within 5 miles of the study area (CDFW, 2013). However, species was observed within five miles southwest of the study area in 1937 and 1948 (Calflora, 2013).
Carpenteria californica tree-anemone	--/CT/1B.2	A very localized endemic found on well-drained granitic soils, mostly on n-facing ravine and drainages. Elevation: 1,115-4,396 feet. Blooms May-July.	Unlikely. Suitable habitat is not present within the study area and the study area is outside of suitable elevation range. No CNDDB recorded occurrences within 5 miles of the study area (CDFW, 2013).
Castilleja campestris ssp. *succulenta* succulent owl's-clover	FT/CE/1B.2	Annual hemiparasitic herb found in vernal pools that are often acidic. Blooms April-May. Elevation: 164 to 2,460 feet.	Low. Study area is within species' known range but suitable habitat is not present within the study area. Species is known to occur within 5 miles of the study area (CDFW, 2013). The nearest presumed extant occurrence is located 2.85 miles north of the study area, approximately 0.25 miles east of Friant Road and 0.5 miles south of Little Dry Creek.
Caulanthus californicus California jewell-flower	FE/CE/1B.1	Annual herb found in Chenopod scrub; pinyon and juniper woodland; valley and foothill grassland with sandy soil. Blooms February-May. Elevation: 200 to 3,281 feet	Low. Study area is within species' known range but provides limited suitable habitat. No CNDDB recorded occurrences within 5 miles of the study area (CDFW, 2013).
Downingia pusilla dwarf downingia	--/--/2B.2	Annual herb found in vernal pools and mesic valley and foothill grassland. Blooms March-May. Elevation: 3 to 1,460 feet.	Low. Study area is within species' known range but provides limited suitable habitat. No CNDDB recorded occurrences within 5 miles of the study area (CDFW, 2013).
Eriastrum hooveri Hoover's eriastrum	--/--/1B.2	Found in chenopod scrub, valley and foothill grassland, pinyon and juniper woodland on sparsely vegetated alkaline alluvial fans; also in the temblor range on sandy soils. 164-3,000 feet elevation. Blooms March-July.	Low. Study area is within species' known range but provides limited suitable habitat. One CNDDB recorded occurrence within 5 miles of the study area in Raisin City; however, the species is believed to be extirpated from this location (CDFW, 2013).
Eriogonum nortonii Pinnacles buckwheat	1B.3	Annual herb occurring in chaparral and valley grassland, often on recently burned areas. Blooms May-September. Elevation: 984-3,199 feet.	Unlikely. Suitable habitat is present in limited amounts within the study area; however, the species is not known to occur in Fresno County (Calflora, 2013). The Study area is outside of the species' known elevation range. There are no CNDDB recorded occurrences within 5 miles of the study area (CDFW, 2013).
Eriogonum nudum var. regirivum Kings River buckwheat	--/--/1B.2	Found in cismontane woodland on rocky limestone slopes along the Kings River. Elevation: 492-984 feet. Blooms August-November.	Unlikely. Suitable habitat is not present within the study area. The Study area is outside of the species' known elevation range. One observation was recorded north side of Pine Flat Reservoir along East Rimmer Springs Road (Calflora, 2013).

TABLE 4.5-2
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in the Study area
Eryngium spinosepalum spiny-sepaled button-celery	--/--/1B.2	Annual or perennial herb found in valley and foothill grassland and vernal pools. Some sites supporting this species contain clay soil of granitic origin. Elevation: 328-1,378 feet. Blooms April-May.	Low. Study area is within species' known range but provides limited suitable habitat. Species is known to occur within one mile of the study area; however, this occurrence is believed to be extirpated (CDFW, 2013; Calflora, 2013). One additional occurrence is recorded five miles northwest of the study area, along Highway 41.
Gratiola heterosepala Boggs Lake hedge-hyssop	--/CE/1B.2	Found in freshwater marshes and swamps and vernal pools. Usually occurs on clay soils in vernal pools and sometimes along lake margins. Elevation: 33-7,792 feet. Blooms April-August.	Low. Study area is within species' known range but provides limited suitable habitat along portions of the Fresno Canal. Species known to occur in the vicinity of Millerton Lake, approximately 10 miles northeast of the study area (Calflora, 2013).
Imperata brevifolia California satintail	--/--/2B.1	Perennial rhizomatous herb found in chaparral; coastal scrub; Mojavean desert scrub; meadows and seeps (often alkali); riparian scrub (mesic). Blooms September-May. Elevation: 0 to 1,640 feet.	**Moderate**. Study area is within species' known range and provides limited suitable habitat. CNDDB recorded occurrence within one mile of the study area, in a stretch of canal or ditch in the vicinity of Belmont Avenue and Trimmer Spring Road (exact location and full extent of population is unknown) (CDFW, 2013).
Lagophylla dichotoma forked hare-leaf	--/--/1B.1	Occurs in valley and foothill grassland, as well as cismontane woodland. Usually found in openings and gravelly roadsides on loam soil or dry clay soil; not known to inhabit serpentine areas. Elevation: 164-2,493 feet. Blooms April-June.	Low. Study area is within species' known range and provides limited suitable habitat. CNDDB recorded occurrence within five miles of the study area near the Kings River, in the Tivy Mountain Preserve (CDFW, 2013).
Leptosiphon serrulatus Madera leptosiphon	--/--/1B.2	Annual herb found is cismontane woodland and lower montane coniferous forest. Blooms April-May. Elevation: 984 to 4,265 feet.	Unlikely. The study area is outside of the species' known elevation range. CNDDB recorded occurrence within five mile of the study area in Tivy Mountain Preserve (CDFW, 2013).
Lupinus citrinus var. citrinus Orange lupine	--/--/1B.2	Occurs in chaparral, cismontane woodland, and lower montane and coniferous forest. Species often found on rocky, decomposed granitic outcrops, usually in open areas, and on flat to rolling terrain. Blooms April-July. Elevation: 4,000-5,300 feet.	Unlikely. The study area is outside of the species' known elevation range.
Mielichhoferia elongata elongated copper moss	--/--/2B.2	Occurs in cismontane woodland (metamorphic rock, usually vernally mesic). Elevation: 1,640-4,265 feet.	Unlikely. Suitable habitat is not present within the study area. Additionally, study area elevation is outside of the species' range.
Mimulus acutidens Kings River monkeyflower	--/--/3	Occurs in foothill woodland and yellow pine forest. Elevation: 0-4,000 feet. Blooms April-July.	Unlikely. Suitable habitat is not present within the study area. All species occurrences are located along the foothills east of the study area (CDFW, 2013).
Mimulus gracilipes Slenderstalk monkeyflower	--/--/1B.2	Annual herb occurring in chaparral (often disturbed areas). Blooms April-June. Elevation: 1,640-4,265.	Unlikely. Suitable habitat is not present within the study area. The study area is outside of the species' known elevation range. All species occurrences are located along the foothills east of the study area (CDFW, 2013).
Orcuttia inaequalis San Joaquin Valley Orcutt grass	FT/CE/1B.1	Annual herb found in vernal pools. Blooms April-Sept. Elevation: 32 to 2,477 feet.	Unlikely. Suitable habitat is not present within the study area. No recorded CNDDB occurrences within five miles (CDFW, 2013). The nearest extant populations are located approximately 3 miles north and northeast of the NE SWTF.

TABLE 4.5-2
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in the Study area
Orcuttia pilosa hairy Orcutt grass	FE/CE/1B.1	Annual herb found in vernal pools. Blooms May-Sept. Elevation: 150 to 656 feet.	Unlikely. Suitable habitat is not present within the study area. No recorded CNDDB occurrences within five miles (CDFW, 2013). The nearest presumed extant population is located on the east side of Highway 41, approximately 5 miles north of the study area.
Pseudobahia bahiifolia Hartweg's golden sunburst	FE/CE/1B.1	Annual herb found in cismontane woodland and valley and foothill grassland with clay soil (often acidic). Blooms March-April. Elevation: 49-492 feet.	Low. Study area is within species' known range but provides limited suitable habitat. Recorded CNDDB occurrences within five miles of the study area, in the vicinity of Friant (CDFW, 2013).
Pseudobahia peirsonii San Joaquin adobe sunburst	FT/CE/1B.1	Annual herb found in valley grassland and foothill woodland. Blooms March-April. Elevation: 295-2,625 feet.	**Moderate.** Study area is within species' known range but provides limited suitable habitat. Recorded CNDDB occurrences within five miles of the study area, in the vicinity of the Friant-Kern Canal and Highway 180; several observations were also made near Round Mountain (CDFW, 2013).
Sagittaria sanfordii Sanford's arrowhead	--/--/1B.2	Perennial rhizomatous emergent herb found in assorted shallow freshwater marshes and swamps. Blooms May-Oct. Elevation: 20 to 4,160 feet.	**Moderate.** Study area is within species' known range but provides limited suitable habitat. Species is known to occur within five miles of the study area (CDFW, 2013). Nearest observations include at a canal north of Ashlan Avenue and east of Maroa, Fresno; within a ditch under Santa Fe railroad at Shaw Avenue; and in the vicinity of Friant Road south of Shepherd Avenue. These locations range between 0.5 to 3 miles from the study area.
Schizymenium shevockii *Shevock's copper moss*	--/--/1B.2	Occurs in cismontane woodland (metamorphic rock and mesic). Elevation: 2,461-4,593 feet.	Unlikely. Suitable habitat is not present within the study area. The Study area is outside of the species' known elevation range.
Sidalcea keckii Keck's checkerbloom	FE/CSC/1B.1	Found in cismontane woodland, valley and foothill grassland, and on grassy slopes in blue oak woodland. Elevation: 500-1,500 feet. Blooms April-May.	Unlikely. The Study area is outside of the species' known elevation range. Species known to occur within five miles of the study area, in the vicinity of Tivy Mountain Preserve (CDFW, 2013).
Tropidocarpum capparideum Caper-fruited tropidocarpum	--/--/1B.1	Annual herb found in valley and foothill grassland (alkaline hills). Blooms March-April. Elevation: 3 to 1,493 feet.	Low. Study area may provide limited suitable habitat. Species has been recorded to occur within five miles of the study area; however, exact location is unknown (CDFW, 2013).
Tuctoria greenei Greene's tuctoria	FE/CR/1B.1	Annual herb found in vernal pools. Blooms May-July (sometimes extending into Sept). Elevation: 98 to 3,510 feet.	Unlikely. Study area is within species' known range but suitable habitat is not present within the study area.
Natural Communities			
Great Valley Mixed Riparian Forest	--/--/--	Tall, dense, deciduous, broad-leaved riparian forest found along floodplains of low gradient streams in California's Sacramento and San Joaquin Valleys.	**High**. Riparian forest habitat occurs in limited amounts along the Fresno Canal within the study area along the San Joaquin River. There are two CNDDB records of this community in the vicinity of the study area, located along the San Joaquin River, Byrd Slough, and Kings River (CDFW, 2013).
Northern Basalt Flow Vernal Pool	--/--/--	Occur in small depressions on tops of massive basalt flows. These pools fill and empty many times during the winter, and have extremely thin soils over the solid bedrock that prevents downward rainwater percolation.	Unlikely. Community does not occur within the study area. Recorded CNDDB occurrences are located on Big Table Mountain (CDFW, 2013).

TABLE 4.5-2
SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Scientific Name Common Name	Listing Status: Federal/State/ CNPS	General Habitat	Potential to Occur in the Study area
Northern Claypan Vernal Pool	--/--/--	Similar to Northern Hardpan Vernal Pool but with lower microtopography and lower overall cover. Found on lower terraces and basin rims.	Low. There is one CNDDB record of Northern Claypan Vernal Pool habitat. The record polygon has an accuracy of one mile and may intersect the study area; it is recorded north of Pinedale and in the vicinity of Friant Road. Due to the urbanization of the study area, poor quality habitat (if any) may be present in the study area.
Northern Hardpan Vernal Pool	--/--/--	Low, amphibious, herbaceous community dominated by annual herbs. Found primarily on alluvial terraces on the east side of the Great Valley in CA.	Low. Poor quality habitat is present in the study area. Several CNDDB occurrences of this community were recorded within five miles of the study area and are generally located more than 1.85 miles north of the NE SWTF (CDFW, 2013).
Sycamore Alluvial Woodland	--/--/--	Sycamore Alluvial Woodlands are open to moderately closed, winter deciduous broadleafed riparian woodlands. They inhabit braided, depositional channels of intermittent streams, usually with a substrate consisting of cobbles or boulders.	Unlikely. Habitat is not present in the study area. Community was recorded by the CNDDB at Lower Mill Creek and Little Dry Creek (CDFW, 2013).

*Species with medium or high potential to occur in the Project Site are shown in **bold**.

Sources: CDFW, 2013; USFWS, 2013; and CNPS, 2013.

KEY:

Federal: (USFWS)
FE = Listed as endangered by the Federal Government
FT = Listed as threatened by the Federal Government
FC = Candidate for listing by the Federal Government

State: (CDFW)
CE = Listed as endangered by the State of California
CT = Listed as threatened by the State of California
CR = Listed as Rare by the State of California (plants only)
CSC = California Species of Concern
CFB = Fully Protected Species

CNPS: (California Native Plant Society)
List 1A = Plants presumed extinct in California
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in California but more common elsewhere
List 3 = Need more information
0.1 = Seriously endangered in California
0.2 = Fairly endangered in California
0.3 = Not very endangered in California
– = No Listing

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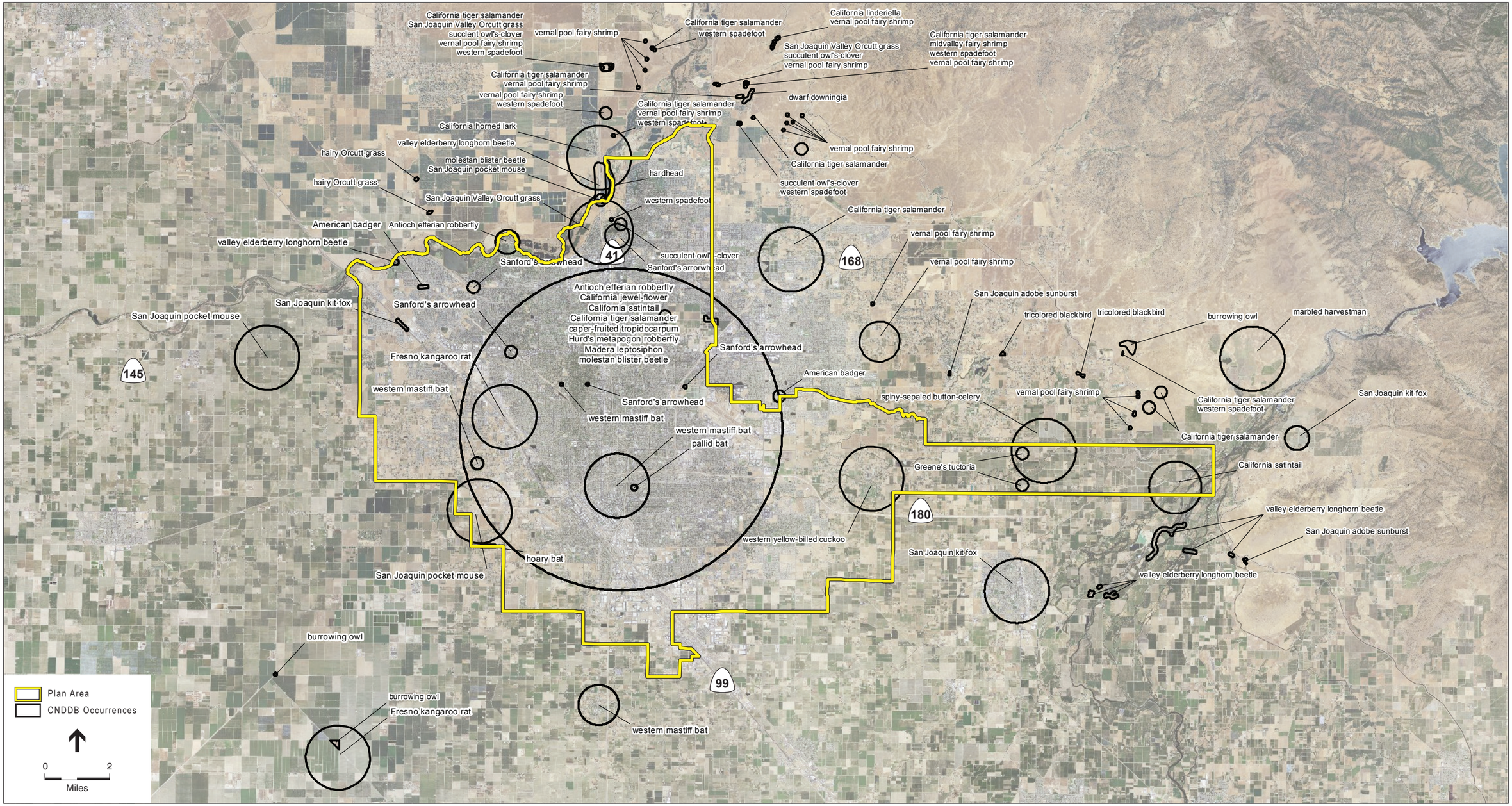

SOURCE: City of Fresno, 2009; USDA, 2012; CNDDB, 2013; ESA, 2013

Figure 4.5-2

CNDDB Occurrences within 3 Miles of the Project Study Area

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Special-status species with a medium to high potential to occur in the proposed project area are discussed in detail below. Species with a low to unlikely potential to occur in the proposed project area are omitted from further discussion because the project site is out of their range, the project area lacks suitable habitat, and/or the likelihood of occurrence are limited based upon specific project site conditions.

Invertebrates

Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetles are unique insects that spend most of their lives within the stems of an elderberry (*Sambucus* spp.) shrub. Females lay their eggs within the bark, where larvae hatch and bore into the stems. Larvae remain within the stems for one to two years. In March, when the elderberries begin to flower, they pupate and emerge as adults. Mating usually occurs in June. Often, the only indicators of their presence are the distinctive small oval openings that are left after larvae pupate and emerge (USFWS, 2009a).

Valley elderberry longhorn beetles utilize elderberry shrubs with a stem diameter of at least one-inch (at ground level) as a host plant (USFWS, 2009a). In the Central Valley, elderberry shrubs are fairly common in remaining riparian forests and adjacent uplands (UC Berkeley, 2013). Elderberry shrubs are typically found growing in association with other riparian species, but they can also occur as isolated shrubs in upland areas (UC Berkeley, 2013).

Historically, valley elderberry longhorn beetles ranged throughout the Central Valley. Currently, they are locally common in scattered populations from Redding to Bakersfield where historical riparian forests still exist (USFWS, 2009a).

Valley elderberry longhorn beetle is listed as threatened by USFWS, with critical habitat designated in 1980 and a final recovery plan issued in 1984. Decline has been primarily due to loss of riparian forests; it has been estimated that over 90 percent of historical riparian forests in the Central Valley have been lost to development or agriculture (UC Berkeley, 2013). Additional threats include inappropriate grazing, levee construction, stream channelization, bank stabilization, and predation by nonnative ants (USFWS, 2009a). Although the USFWS five year review of the status of valley elderberry longhorn beetle released in September 2006 recommended delisting of this species, the valley elderberry longhorn beetle currently remains federally-listed as threatened (USFWS, 2009a).

Within areas encompassing near-term project elements, elderberry shrubs occur along the eastern portions of the Fresno Canal and may provide suitable habitat for valley elderberry longhorn beetle. A survey to count the number of stems and note the presence of exit holes was not conducted due to site access limitations. A total of eleven occurrences were recorded in the CNDDB within five miles of the study area along the San Joaquin River and the Kings River and its tributaries, among many other locations (CDFW, 2013).

Reptiles

Western Pond Turtle

Western pond turtles are moderate-sized aquatic turtles that feed on plants, insects, worms, amphibians, crustaceans, and carrion. Mating usually occurs in late April or early May, but may occur year-round. Hatchling turtles are thought to emerge from the nest and move to aquatic sites in the spring (Jennings and Hayes, 1994; Stebbins, 2003).

Western pond turtles are commonly found in ponds, lakes, marshes, rivers, streams, and irrigation ditches with rocky or muddy substrates surrounded by aquatic vegetation. These watercourses usually are within woodlands, grasslands, and open forests, between sea level and 6,000 feet in elevation. Turtles bask on logs or other objects when water temperatures are lower than air temperatures. Nests are located at upland sites, often up to 0.25 mile from an aquatic site (Jennings and Hayes, 1994; Stebbins, 2003).

Suitable habitat for the western pond turtle is present within areas encompassing near-term project elements, including along the Fresno Canal. A total of two occurrences were recorded within five miles of the study area (CDFW, 2013). Additionally, a pond turtle (species unidentified) was observed within the Fresno Canal during site reconnaissance. The western pond turtle is a California Species of Concern.

Birds

Burrowing Owl

Burrowing owl is a small diurnal owl that nests underground in the burrows of small mammals, especially those of ground squirrels. Culverts and other human-made structures may also be suitable habitat for the burrowing owl. Often a burrowing owl will occupy several burrows in an area. In the Central Valley, the burrowing owl is a year-round resident of open spaces such as grasslands, agricultural fields, air fields, and levees. Vegetation must be very short or very sparse to be suitable habitat for burrowing owl. Breeding peaks from April to May, but can occur from March to August. The burrowing owl forages on insects and small mammals and will also consume reptiles, birds, and carrion (Zeiner et al., 1988).

Suitable habitat for the burrowing owl occurs in fallow fields, open grasslands, and sparsely vegetated or barren areas within the proposed project area. A total of two occurrences were recorded in the CNDDB within five miles of the study area (CDFW, 2013). The burrowing owl is a California Species of Concern.

Tricolored Blackbird

Tricolored blackbirds are a colonial nesting species that construct their nests in dense vegetation in and near freshwater wetlands. When nesting, tricolored blackbirds generally require freshwater wetland areas large enough to support colonies of 50 pairs or more. They prefer freshwater emergent wetlands with tall, dense cattails or tules for nesting, but also breed in thickets of willow, blackberry, wild rose, or tall herbs. During the nonbreeding season, flocks are highly mobile and forage in grasslands, croplands, and wetlands.

Suitable habitat for the tricolored blackbird occurs in proposed project areas that support freshwater emergent wetland or wetland vegetation (such as the Fresno Canal). Tricolored blackbird is a California Species of Concern.

Swainson's Hawk

The Swainson's hawk is a long-distance migrant species. The Central Valley population winters primarily in Mexico and arrives at their breeding grounds in the Central Valley in mid-March to early April. Nests are generally found in scattered trees or along riparian woodlands adjacent to agricultural fields or pastures, but the species will also nest in tall shrubs and trees in proximity to developments near foraging habitat. Prey species mainly include small mammals, reptiles, and insects. Egg-laying generally occurs in April and young hatch in May and June. Most young have fledged the nest by the end of July and are relatively independent of parental protection. However, fledged young remain with their parents until they migrate in the fall. Migration to the wintering grounds generally occurs around September. Some individuals or small groups may winter in California (Zeiner et al, 1988).

Suitable nesting and foraging habitat for Swainson's hawk occurs within the proposed project area. Within areas that encompass near-term project elements, suitable habitat for this species may occur along the Fresno Canal and scattered trees along the conveyance pipeline alignments. However, the nearest CNDDB recorded occurrences are located more than 15 miles north of the project area (CDFW, 2013). The Swainson's hawk is a California threatened species.

California Horned Lark

California horned larks are mid-sized songbirds that form large flocks for foraging and roosting. They build grass-lined nests directly on the ground, in dry, open habitats with sparse vegetation. This species is a common to abundant resident songbird in a variety of open habitats. Range-wide, California horned larks breed in level or gently sloping shortgrass prairie, montane meadows, barren fields, opens coastal plains, fallow grain fields, row crops, and alkali flats. Horned larks range across North America from Alaska and the Canadian arctic southward to southern Mexico (Zeiner et al., 1988).

Suitable habitat for the California horned lark occurs throughout the proposed project area in agricultural (barren, fallow, or row crops) and open areas. Only one occurrence of California horned lark was recorded in the vicinity of the project area, located north of Lanes Bridge on the San Joaquin River, near Highway 41 (CDFW, 2013). The California horned lark is a California Species of Special Concern.

Mammals

Western Mastiff Bat

The western mastiff bat is one of four molossids that occur in California. Molossids are bats that have a "free tail" which extends visibly beyond the edge of the tail membrane. The Western mastiff bat is the largest bat species found in California with a wingspan of 53 to 56 centimeters (cm), a forearm of 75-83 milimeters (mm), and an adult weight of 60-72 grams (g) (CDFG, 1998).

The western mastiff bat is a colonial species, with populations typically less than 100 individuals. They primarily roost in crevices in vertical cliffs, usually granite or consolidated sandstone, and in broken terrain with exposed rock faces; they may also be found occasionally in high buildings, trees and tunnels. Roost sites may change from season to season. Due to its large size, this bat needs vertical faces to drop from in order to take flight. Nursery roosts are found in tight rock crevices with mating taking place in the spring resulting in one young born during the summer. They do not undergo prolonged hibernation- remaining active all winter. While some local populations in southern California have been known to change roost sites, the species is believed to typically remain in an area year-round. They mate in the spring and give birth to a single young in early to mid-summer (CDFG, 1998).

Suitable habitat for the western mastiff bat occurs throughout the proposed project area on high buildings in urban areas and within trees. A total of four occurrences were recorded within five miles of the project area (CDFW, 2013). The western mastiff bat is a California Species of Special Concern.

Hoary bat

The hoary bat is found throughout California. Maternity sites are found in inland areas, in woodland and forest areas that contain medium to large-sized trees and are densely foliated. Roosting sites are also found in densely foliated areas with medium to large trees, but species prefers areas with habitat mosaics. The hoary bat is typically found in areas with access to trees for cover, but forages in open areas or habitat edges. Hoary bats feed primarily on moths, but will take any flying insect. Foraging flight is typically fast and straight (Zeiner et al., 1988).

Suitable habitat for the hoary bat exists in the proposed project area; and one CNDDB occurrence was recorded within five miles of the project area (CDFW, 2013). The hoary bat does not have a federal or State special status.

American Badger

American badgers are carnivorous, eating fossorial rodents, reptiles, insects, earthworms, eggs, birds, and carrion. Their diet shifts in response to prey abundance. Badgers are active year-round, although they do experience periods of torpor during the winter (Zeiner et al., 1988). American badgers are present in most shrub, forest, and herbaceous habitats where friable soils are present. They are most abundant in drier, open areas including grasslands, savannahs, and mountain meadows near the timberline. Badgers dig burrows for cover; they frequently use old burrows, but some badgers will dig a new burrow each night during the summer (Williams, 1986; Zeiner et al., 1988).

American badgers were historically residents of California, except in the humid coastal areas of Del Norte and northern Humboldt Counties (Williams, 1986; Zeiner et al., 1988). Currently, they survive in low numbers in the periphery of the Central Valley, adjacent lowlands of eastern Monterey, San Benito, and San Luis Obispo Counties, and coastal areas south of Mendocino County. They have been extirpated from much of southern California (Williams, 1986).

Annual grassland habitat within and directly adjacent to the proposed project area provides suitable habitat for the American badger. Two CNDDB occurrences were recorded within five miles of the project area (CDFG, 2013). The American badger does not have a federal or State special status.

San Joaquin Kit Fox

The San Joaquin kit fox is the smallest fox in North America. It has an average body length of 20 inches and weighs about five pounds, with long legs and large ears. Their coat ranges from tan to buffy gray in the summer to silvery gray in the winter with a whitish belly and black-tipped tail.

San Joaquin kit foxes will use dens that they dig out in addition to dens constructed by other animals. They will also use man-made structures such as culverts, abandoned pipelines, banks in sumps or roadbeds, etc. Dens are used for temperature regulation, shelter from adverse weather, and protection from predators (USFWS, 2009b).

Historically, kit foxes were found in several habitats throughout the San Joaquin Valley. Today, many of these communities are fragmented. Kit foxes are often found in annual grassland and scrubland habitats, often in areas that are highly modified by oil exploration, wind turbines, agricultural practices, and/or grazing (USFWS, 2009b). Kit foxes have also been found in and near urban communities where they behave as scavengers and are relatively tame (USFWS, 1998).

Suitable habitat for the San Joaquin kit fox occurs within annual grassland and agricultural habitats within the proposed project area. Three CNDDB occurrences were recorded within five miles of the project area (CDFW, 2013). The San Joaquin kit fox is a federally endangered and California threatened species.

Plants

California Satintail

The California satintail is a perennial rhizomatous grass that occurs on chaparral, coastal sage scrub, creosote bush scrub, meadows and seeps, and wetland-riparian habitats below 1,640 feet in elevation (Calflora, 2013). It blooms from September through May. The species was mistakenly classified as a noxious weed in California from 1960 to 2004 and is currently threatened by development and agriculture (CNPS, 2013). It is presumed extant in Fresno County and occurs in the vicinity of Belmont Avenue and Trimmer Springs Road within an irrigation ditch (unspecified) (CDFW, 2013 and Calflora, 2013).

Suitable habitat for the California satintail occurs within limited areas of the project area, specifically in areas that encompass near-term project elements (riparian and freshwater emergent wetland habitats along the Fresno Canal). Two CNDDB occurrences were recorded within one mile of the project area (CDFW, 2013); however, the extent of the populations and exact locations are unknown. The California satintail is a CNPS rare plant rank 2B.1 (seriously endangered in California).

San Joaquin Adobe Sunburst

San Joaquin adobe sunburst, a member of the sunflower family (*Asteraceae*), is an annual herb that grows approximately 20 to 70 cm (8 to 28 inches) tall. This species can be detected from March to April, when bright yellow flower heads are produced.

San Joaquin adobe sunburst (*Pseudobahia peirsonii*) was federally listed as threatened on February 6, 1997. Critical habitat has not been formally designated for this species, and no recovery plan has been prepared.

San Joaquin adobe sunburst is a California Endangered species and is a CNPS Rank 1B species (plants rare, threatened, or endangered in California and elsewhere).

Sanford's Arrowhead

Sanford's arrowhead is an emergent aquatic perennial in the water plantain family (*Alismataceae*). Emergent leaf blades are 14 to 25 cm (5 to 10 inches) long, linear and 3-angle to narrowly ovate. Sanford's arrowhead does not have arrow shaped leaves like other *Sagittaria* species. It flowers in several whorls, located well below leaf ends. Blooming period for this species occurs between May and October.

Sanford's arrowhead occurs in shallow, standing, fresh water and sluggish waterways within the following: marshes, swamps, ponds, vernal pools and lakes, reservoirs, sloughs, ditches, canals, streams and rivers. Elevation range is from 20 to 4,160 feet.

Sanford's arrowhead is a CNPS Rank 1B species (plants rare, threatened, or endangered in California and elsewhere).

Natural Communities

Great Valley Mixed Riparian Forest

Great Valley mixed riparian forest is a tall, dense, deciduous, broad-leaved riparian forest found along floodplains of low gradient streams in California's Sacramento and San Joaquin Valleys. The tree canopy is usually fairly well closed and moderately to densely stocked with several species including *Acer negundo* var. *californica*, *Juglans hindsii*, *Platanus racemosa*, *Populus fremontii*, *Salix gooddingii*, *Salix laevigata*, and *Salix lucida*. Understories consist of these taxa plus shade-tolerant shrubs like *Cephalanthus occidentalis* and *Fraxinus latifolia* (Holland, 1986). Great Valley mixed riparian forest occurs on relatively fine-textured alluvium from active river channels. These sites experience overbank flooding (with abundant alluvial deposition and groundwater recharge) but not too severe physical battering or erosion (Holland, 1986).Within the project area, Great Valley mixed riparian forest (also described as valley foothill riparian forest above) occurs along the Fresno Canal, primarily the western portions of the canal channel.

Designated Critical Habitat

The USFWS designates critical habitat for certain species listed by the agency as threatened or endangered. "Critical habitat" is defined in Section 3(5)(A) of the federal ESA as those lands within a listed species' current range that contain the physical or biological features considered

essential to the species' conservation, as well as areas outside the species' current range that are determined to be essential to its conservation. The proposed project area is not located within designated critical habitat for any federally listed species. Critical habitats within 5 to10 miles of the project area has been designated for Keck's checker-mallow (*Sidalcea keckii*), fleshy owl's-clover (*Castilleja campestris ssp. succulenta*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), San Joaquin Orcutt grass (*Orcuttia inaequalis*), hairy Orcutt grass (*Orcuttia pilosa*), and California tiger salamander (*Ambystoma californiense*).

Sensitive Natural Communities

Sensitive habitats can be defined as any area in which plant or animal life or their habitats are either rare or especially valuable and any area which meets one of the following criteria: (1) habitats containing or supporting "rare and endangered" species as defined by the State Fish and Game Commission; (2) all perennial and intermittent streams and their tributaries; (3) coastal tide lands and marshes; (4) coastal and offshore areas containing breeding or nesting sites and coastal areas used by migratory and resident water-associated birds for resting areas and feeding; (5) areas used for scientific study and research concerning fish and wildlife; (6) lakes and ponds and adjacent shore habitat; (7) existing game and wildlife refuges and reserves; and (8) sand dunes.

Several sensitive habitats have been identified within the project area. Elderberry shrubs occur along the Fresno Canal which may support the federally-threatened valley elderberry longhorn beetle. Additionally, the Great Valley mixed riparian forest was recorded in the CNDDB as a sensitive community (CDFW, 2013); this community occurs within the proposed project area in limited amounts.

Wildlife Movement Corridors

Wildlife movement corridors are considered an important ecological resource by various agencies (CDFW and USFWS) and under CEQA. Movement corridors may provide favorable locations for wildlife to travel between different habitat areas such as foraging sites, breeding sites, cover areas, and preferred summer and winter range locations. They may also function as dispersal corridors allowing animals to move between various locations within their range. Areas of human disturbance or urban development can fragment wildlife habitats and impede wildlife movement between areas of suitable habitat. This fragmentation creates isolated "islands" of vegetation that may not provide sufficient area to accommodate sustainable populations, and can adversely affect genetic and species diversity.

The Fresno Canal and scattered riparian habitats along the canal may serve as a wildlife movement corridor. Other areas within the proposed project area are not likely to provide wildlife movement corridors due to the highly fragmented and urbanized nature of these areas.

4.5.2 Regulatory Setting

Federal

U.S. Fish and Wildlife Service

USFWS administers the federal ESA (16 United States Code [USC] 153 et seq.), the Migratory Bird Treaty Act (16 USC 703–711), and the Bald Eagle Protection Act (16 USC 668), among other programs discussed below.

Federal Endangered Species Act

Under federal ESA, the Secretary of the Interior and the Secretary of Commerce have joint authority to list a species as threatened or endangered (16 USC 1533[c]). Two federal agencies oversee the federal ESA: the USFWS has jurisdiction over plants, wildlife, and resident fish, and the National Marine Fisheries (NMFS) has jurisdiction over anadromous and marine fish as well as mammals. Section 7 of federal ESA mandates that all federal agencies consult with the USFWS and NMFS to ensure that federal agency actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species. Federal ESA prohibits the "take"[2] of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery.

Section 10 of federal ESA requires the issuance of an incidental take permit before any public or private action may be taken that could harm, harass, injure, kill, capture, collect, or otherwise hurt any individual of an endangered or threatened species. The permit requires preparation and implementation of a habitat conservation plan that provides specific measures to offset project impacts on endangered or threatened species.

The USFWS also publishes a list of candidate species. Species on this list receive "special attention" from federal agencies during environmental review, although they are not protected otherwise under the federal ESA. The candidate species are those for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened. Project impacts on such species would be considered significant in this EIR. Species of Concern is an informal term, not defined in the federal ESA. The Sacramento Office of the USFWS no longer maintains a Federal Species of Concern list.

Pursuant to the requirements of federal ESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed threatened or endangered species could be present in the proposed project area and whether the project action would have a potentially significant impact on such species. In addition, the agency is required to determine whether the project action is likely to jeopardize the continued existence of any species proposed to be listed under federal ESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]).

[2] "Take" is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct.

Similarly, the permitting responsibilities of the Corps include consultation with the USFWS and NMFS when federally listed species (i.e., listed under the federal ESA) are at risk. At both the State and federal levels, the process requires that a Biological Assessment be prepared to determine the effects on listed species. Under both USFWS and CDFW policy, species of concern are not subject to the same consultation requirements as listed endangered, rare, or threatened species, but the agencies encourage informal consultation for species of concern that may become officially listed before completion of the CEQA process.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 USC 703, Supp. I, 1989) prohibits the killing, possessing, or trading of migratory birds, bird parts, eggs, and nests, except in accordance with regulations prescribed by the Secretary of the Interior.

U.S. Army Corps of Engineers

Section 404 of the Clean Water Act

The term "waters of the United States" is defined in the CFR (33 CFR 328.3[a]; 40 CFR 230.3[s]), and includes waters that could be used in interstate or foreign commerce, interstate wetlands, and other waters such as intrastate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, sloughs, wet meadows, playa lakes, or natural ponds, where the use, degradation, or destruction of which could affect interstate or foreign commerce[3]. Waters of the United States do not include prior converted cropland, stock watering ponds, and agricultural irrigation ditches created in upland areas. Wetlands are defined by the federal government (CFR, Section 328.3(b), 1991) as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

State

California Department of Fish and Wildlife

CDFW administers a number of laws and programs, discussed below, designed to protect State listed fish and wildlife resources.

California Endangered Species Act

The California Endangered Species Act of 1984 (CESA) – Fish and Game Code Section 2050 et seq – regulates the listing and "take" of State endangered and threatened species. A "take" of such a species may be permitted by CDFW through issuance of permits pursuant to Fish and Game Code Section 2081, except for designed "fully protected" species (see subsection below).

[3] Since the SWANCC decision (Solid Waste Agency of Northern Cook County v. Corps), waters covered solely by this definition by virtue of their use as habitat by migratory birds are no longer considered "waters of the United States." The Supreme Court's opinion did not specifically address what other connections with interstate commerce might support the assertion of CWA jurisdiction over "nonnavigable, isolated, intrastate waters" under this definition, and the Corps is recommending case by case consideration. A factor that may be relevant to this consideration includes, but is not limited to, the following: Jurisdiction of isolated, intrastate, and nonnavigable waters may be possible if their use, degradation, or destruction could affect other "waters of the United States," thus establishing a significant nexus between the water in question and other "waters of the United States" (Corps, undated memorandum).

Fully Protected Species

Prior to enactment of CESA, the designation of "Fully Protected" was used by CDFW to identify species that had been given special protection by the California Legislature by a series of statutes in the California Fish and Game Code. (See Sections 3503.5, 3505, 3511, 3513, 4700, 4800, 5050, 5515). Many fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations; however, the original statutes have not been repealed, and the legal protection they give the species identified within them remains in place. Fully Protected species may not be taken or possessed at any time; and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. Because endangered or threatened species can be "taken" for development purposes with the issuance of a permit by CDFW, "fully protected species" actually enjoy a greater level of legal protection than "listed" species.

Protection of Nesting Birds

Section 3503.5 of the California Fish and Game Code states that it is "unlawful to take, possess, or destroy the nests or eggs of any such bird of prey (i.e., species in the orders Falconiformes and Strigiformes) except otherwise provided by this code or any other regulation adopted hereto." Active nests of all other birds (except English sparrow (*Passer domesticus)* and European starling (*Sturnus vulgaris*)) are similarly protected under Section 3503 of the California Fish and Game Code, as well as birds designated in the International Migratory Bird Treaty Action under Section 3513 of the California Fish and Game Code. Disturbance that causes nest abandonment and/or reproductive failure is considered a take by the CDFW. This statute does not provide for the issuance of an incidental take permit.

Species of Special Concern

CDFW also designates Species of Special Concern (SSC) which are species of limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. These species do not have the same legal protection as listed species or fully protected species but may be added to official lists in the future. The SSC list is intended by CDFW as a management tool for consideration in future land use decisions. Under CDFW policy, SSC are not subject to the same consultation requirements as listed endangered, rare, or threatened species, but the agency encourages informal consultation for SSC that may become officially listed before completion of the CEQA process.

Native Plant Protection Act

California Fish and Game Code Section 1900–1913, also known as the Native Plant Protection Act, is intended to preserve, protect, and enhance endangered or rare native plants in California. The act directs CDFW to establish criteria for determining what native plants are rare or endangered. Under Section 1901, a species is endangered when its prospects for survival and reproduction are in immediate jeopardy from one or more cause. A species is rare when, although not threatened with immediate extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens. The act also directs the California Fish and Game

Commission to adopt regulations governing the taking, possessing, propagation, or sale of any endangered or rare native plant.

California Native Plant Society

Vascular plants listed as rare or endangered by the CNPS (CNPS, 2013), but which may have no designated status or protection under federal or State endangered species legislation, are defined as follows:

- **Rank 1A:** Plants presumed extinct in California.
- **Rank 1B:** Plants rare, threatened, or endangered in California and elsewhere.
- **Rank 2:** Plants rare, threatened, or endangered in California, but more numerous elsewhere.
- **Rank 3:** Plants about which more information is needed (a review list).
- **Rank 4:** Plants of limited distribution (a watch list).

In general, plants ranked 1A, 1B, or 2 are considered to meet the criteria of CEQA Guidelines section 15380 and effects to these species are considered significant in this EIR. Additionally, plants ranked 1A, 1B, or 2 meet the definition of Section 1901, Chapter 10 (Native Plant Protection Act) and Sections 2062 and 2067 (California Endangered Species Act) of the California Fish and Game Code.

Lake and Streambed Alteration Program

CDFW is authorized under the California Fish and Game Code Sections 1600–1607 to develop mitigation measures and enter into a Streambed Alteration Agreements with applicants who propose projects that would obstruct the flow of, or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams.

State Water Resources Board

Section 401 of the Clean Water Act

Section 401 of the CWA requires an applicant for any federal permit (e.g. a 404 (b)(1) permit from the Corp for "fill" of wetlands) that proposes an activity which may result in a discharge to "waters of the State" obtain certification from the SWRCB, acting through the RWQCB, that the Corps permit action meets state water quality objectives.

Section 401 grants the State of California, through the RWQCB, the right to ensure it's interests are protected on any federally permitted activity occurring in or adjacent to waters of the State. Therefore, if a proposed project requires a 404 permit and has the potential to impact waters of the State, the RWQCB will regulate the project and associated activities through a Water Quality Certification determination. The Corps will not issue a 404 permit until the RWQCB has been notified and the applicant has obtained a certification.

Porter-Cologne Act

If the Corps determines that wetlands or other waters of the U.S. are isolated waters and not subject

to regulations under Section 401 of the Clean Water Act, the RWQCB may choose to exert jurisdiction over these waters under the Porter-Cologne Act as waters of the state.

Local

City of Fresno General Plan

The 2025 Fresno General Plan is a long-range planning document designed to direct the physical growth and development of the City through 2025. The Fresno General Plan Resource Conservation Element focuses on comprehensive, long-range management, preservation, and conservation of the City's natural resources. In addition to biological resources, the Resource Conservation Element also addresses water resources, air quality, agricultural land, mineral resources, energy conservation, and historic resources.

The 2025 Fresno General Plan has adopted the following Resources Conservation policies to protect natural resources within the City's proposed project area. Below are Goals, Objectives, and Policies that are applicable to natural resources for the proposed project.

Goal 11 Protect, preserve, and enhance significant biological, archaeological, and paleontological resources and critical natural resources including, but not limited to, air, water, agricultural soils, mineral, plant, and wildlife resources.

Objective G-12 To provide for long-term preservation, enhancement, and enjoyment of plant, wildlife, and aquatic habitat resources in the Fresno area by protecting, improving, and restoring these resources.

Policies G-12-a through G-12-l are specific policies designed to support Goal 11 and Objective G-12. Below are policies that are relevant to the proposed project:

G-12-d Policy Projects that could adversely affect rare, threatened, or endangered wildlife and vegetative species (or may have impacts on wildlife, fish, and vegetation restoration programs) may be approved only when findings are made by the California Department of Fish and Game (and the U.S. Fish and Wildlife Service, as appropriate) that adequate mitigation measures are incorporated in the project's design.

G-12-e Policy Open Space land use designations, appropriate zoning, setbacks, and conservation easements will be used to preserve areas identified as sensitive or critical habitat for rare, threatened, or endangered vegetation and wildlife species, with particular attention paid to the North and Southeast Growth Areas and to the preparation of the required community and/or specific plans for these expansion areas of the proposed 2025 Fresno General Plan.

G-12-f Policy If the California Department of Fish and Game or federal conservation agencies require habitat replacement as a condition of, or mitigation for, any development project in Fresno's planning area, such replacement or mitigation habitat should be located, if possible, within or near the Fresno-Clovis Metropolitan Area.

G-12-g Policy Mitigation programs involving restoration of natural habitats shall include measures needed to create functional, sustainable wildlife habitat. Specific components of these programs will include:

- an evaluation of the site's pre-project environmental setting and the proposed design and operating parameters of the mitigation measures, to be evaluated in the project's CEQA/NEPA environmental review process.
- a graphic depiction of land to be acquired or set aside for mitigation activities.
- permitting required by local, state, and federal agencies for the project.
- mitigation site preparation plans.
- specification of the types and sources of plant material used for any revegetation.
- water supply and distribution for plants and wildlife.
- post-planting maintenance and other operational measures to ensure successful mitigation.
- monitoring at an appropriate frequency by qualified personnel and reporting of data collected during monitoring to permitting agencies.

G-12-j Policy Where appropriate in flood zones along water courses and flood detention basins, pursue development of conjunctive habitat and recreational trail uses in flood control and drainage projects.

Objective G-13 Maintain and restore, where feasible, the ecological values of the San Joaquin River corridor, because (1) this area is Fresno's main scenic feature and natural area; (2) it is important for maintenance of good-quality water resources in the region; and (3) it constitutes unique, irreplaceable habitat for the valley native species.

Policies G-13-a through G-13-e are specific policies designed to support Goal 11 and Objective G-13. Below are policies that are relevant to the proposed project:

G-13-a Policy Adopted plans, codes/ordinances, regulations, and policies of the city will continue to indicate strong concern for, and protection of, the San Joaquin River bluffs and the riverbottom, to promote Fresno's scenic amenities and protect the river's water quality, fisheries, and associated riparian environment.

G-13-b Policy Support Fresno County General Plan policies which promote the preservation and enhancement of natural resources in Fresno County's river influence areas.

G-13-c Policy Apply, and continue to honor, the open space land use designation in the entire San Joaquin riverbottom and bluffs when considering land use decisions in the vicinity of the river. Ensure that development

projects in the vicinity of the river corridor protect and compliment its habitats and natural settings, including development within the proposed North Growth Area of the 2025 Fresno General Plan.

G-13-e Policy Support efforts to identify and mitigate cumulative adverse effects on aquatic life from stormwater discharge to the San Joaquin River.

- Discharge of runoff from industrial and commercial land uses to the San Joaquin River or other riparian corridors shall be avoided.
- Development entitlements for sites which have drainage (directly or indirectly) to the San Joaquin River or other riparian areas shall be conditioned upon adequate measures for preventing pollution of natural bodies of water from their runoff.
- Water quality and sediments shall be frequently monitored near drainage outfalls to riparian areas.
- If unacceptable levels of contaminant(s) occur, remedial measures shall be promptly instituted.

City of Fresno Tree Protection Ordinance

Street trees are protected by Fresno Municipal Code (F.M.C. 11-305) and the removal of a street tree requires a tree removal permit to be submitted to the Forestry Supervisor of the Street Maintenance Division.

Fresno County Oak Woodland Protection

The Vegetation Element of the Fresno County General Plan adopted by the Fresno County Board of Supervisors on March 10, 1998 (Resolution # 98-150) contains the following policy for the protection of oak woodlands (guidelines relevant to the proposed project are listed below):

OS-F.10 The County shall promote the preservation and management of oak woodlands by encouraging landowners to follow the Fresno County Oak Management Guidelines shown below and to prepare an Oak Management Plan for their property.

Fresno County Oak Woodlands Management Guidelines (Policy OS-F.10)

When Building within Oak Woodlands:

- Develop an Oak Woodland Management Plan to retain existing oaks, preserve agriculture, retain wildlife corridors, and enhance soil and water conservation practices.
- Avoid tree root compaction during construction by limiting heavy equipment in root zones.
- Carefully plan roads, cuts and fills, building foundations, and septic systems to avoid damage to tree roots. Design roads and consolidate utility services to minimize erosion and sedimentation to downstream sources. Also, consider reseeding any disturbed ground.

- Avoid landscaping which requires irrigation within ten (10) feet of the trunk of an existing oak tree to prevent root rot.
- Consider replacing trees whose removal during construction was avoidable.
- Use fire-inhibiting and drought-tolerant and oak-compatible landscaping wherever possible.

The Recovery Plan for Upland Species of the San Joaquin Valley, California

The project area lies within the coverage area of *The Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS, 1998). The primary objective of this recovery plan is the recovery of 11 endangered and threatened species, along with protection and long-term conservation of candidate species and species of special concern. The species covered in the plan inhabit grasslands and scrublands of the San Joaquin Valley, adjacent foothills, and small valleys. Species covered within this plan are classified as Species of Local Concern (SLC) in this report.

The Recovery Plan does not identify the area within and surrounding the proposed project area as having regional biological significance for the species covered within the plan. The proposed project is not near or within areas proposed for reserves or where connectivity and linkages should be promoted.

4.5.3 Impacts and Mitigation Measures

Methods of Analysis

In conducting the following impact analysis, three principal components of the Guidelines outlined above were considered:

- Magnitude of the impact (e.g., substantial/not substantial);
- Uniqueness of the affected resource (i.e., rarity of the resource); and
- Susceptibility of the affected resource to perturbation (i.e., sensitivity of the resource).

The evaluation of the significance of the following impacts considered the interrelationship of these three components. For example, a relatively small magnitude impact to a State or federally listed species would be considered significant because the species is very rare and is believed to be very susceptible to disturbance. Conversely, a plant community such as California annual grassland is not necessarily rare or sensitive to disturbance. Therefore, a much larger magnitude of impact would be required to be classified as significant.

This impact analysis focuses on foreseeable changes to the baseline condition in the context of the significance criteria presented above. Impacts of the project in relation to these issues were assessed for near term project elements and future project elements (refer to Chapter 3 for detailed project description).

Standards of Significance

Based on section 15065 and Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Impacts Not Further Evaluated

Interfere substantially with the movement of any native resident or migratory fish. There is no suitable aquatic habitat for special-status fish species and they are not present in the project area; therefore, there are no impacts to these species or their habitat and this issue will not be further evaluated in the EIR.

Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. There are no planned or adopted Habitat Conservation Plans or Natural Community Conservation Plans for the areas encompassing the proposed project area. The Recovery Plan for Upland Species of the San Joaquin Valley, California does not identify the area within and surrounding the proposed project area as having regional biological significance for the species covered within the plan. Therefore, the proposed project would not conflict with any adopted conservation or recovery plans and this issue will not be further evaluated in the EIR.

Impacts and Mitigation Measures

Table 4.5-3 provides a summary of the impact analysis for issues related to biological resources.

TABLE 4.5-3
PROPOSED PROJECT IMPACT SUMMARY – BIOLOGICAL RESOURCES

	Near Term Project Elements		Future Project Elements	
Impact	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.5.1: Implementation of the proposed project could result in potential disturbance or loss of special-status or migratory bird species and their habitats.	S	LS	S	LS
Impact 4.5.2: Implementation of the proposed project could result in potential disturbance or loss of valley elderberry longhorn beetle and its host plant, the elderberry shrub.	S	LS	S	LS
Impact 4.5.3: Implementation of the proposed project could result in potential disturbance or loss of western pond turtle and its habitat.	S	LS	S	LS
Impact 4.5.4: Implementation of the proposed project could result in potential disturbance or loss of San Joaquin kit fox and its habitat.	S	LS	S	LS
Impact 4.5.5: Implementation of the proposed project could result in potential disturbance or loss of American badger and its habitat.	S	LS	S	LS
Impact 4.5.6: Proposed project activities could result in potential disturbance or loss of Western mastiff bat and hoary bat and their habitat.	S	LS	S	LS
Impact 4.5.7: Implementation of the proposed project could result in significant effects to rare or special-status plants and their habitat.	S	LS	S	LS
Impact 4.5.8: Implementation of the proposed project could result in the removal, filling, interruption or degradation of protected wetlands and other waters of the United States.	S	LS	S	LS
Impact 4.5.9: Proposed project activities could result in the removal of street trees protected by the City of Fresno or oak woodland habitat located within Fresno County.	S	LS	S	LS
Impact 4.5.10: Proposed project activities could potentially result in disturbance or loss of riparian habitat and/or lake or streambed alteration through direct and indirect impacts.	S	LS	S	LS
Impact 4.5.11: Proposed project activities could potentially interfere with wildlife movement corridors through direct and indirect impacts.	S	LS	LS	NA

TABLE 4.5-3
PROPOSED PROJECT IMPACT SUMMARY – BIOLOGICAL RESOURCES

Impact	Near Term Project Elements		Future Project Elements	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Impact 4.5.12: Implementation of the proposed project, when combined with development of other future projects, could contribute to the cumulative loss or degradation of habitat or species protected under federal, State and local regulations.	S	LS	S	LS

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less than Significant Impact
NA = Not Applicable

Impact 4.5.1: Implementation of the proposed project could result in potential disturbance or loss of special-status or migratory bird species and their habitats. (Significant)

Near Term and Future Project Elements

Burrowing Owl: The proposed project area supports suitable breeding and foraging habitat for burrowing owls. This habitat could be removed or disturbed during construction and maintenance activities including ground surface blading, grading and subsurface trenching, storage of trench spoils and/or equipment, or pipeline installation. Removal or disturbance of this habitat could reduce or degrade availability of suitable nesting and foraging habitat to burrowing owls.

Horned Lark, Swainson's Hawk, and Migratory Birds: The proposed project area supports suitable breeding and foraging habitat for horned larks, Swainson's hawk, other raptors, and migratory birds. This habitat could be removed or disturbed during construction and maintenance activities including ground surface blading, grading and subsurface trenching, tree or shrub removal and tree trimming/crushing, storage of trench spoils and/or equipment, or pipeline installation. Removal or disturbance of this habitat could reduce availability of suitable nesting and foraging habitat to these bird species. Permanent loss of habitat could occur in areas where permanent structures are placed and temporary loss could occur where areas are disturbed and then returned to pre-existing conditions. As a result, construction of the proposed project facilities has the potential to result in significant impacts to special-status and migratory bird species and their habitats.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level because surveys would be conducted prior to construction activities and additional protection measures would be implemented to avoid and/or reduce disturbance and/or loss of habitat.

> **Measure 4.5.1a (NT/F):** Pre-construction surveys for burrowing owls shall be conducted at any proposed project site containing suitable habitat by a qualified biologist [as approved by CDFW] within 30-days prior to the start of work activities where land construction is planned in known or suitable habitat for burrowing owls. If construction activities are delayed

for more than 30 days after the initial preconstruction surveys, then a new preconstruction survey shall be required. All surveys shall be conducted in accordance with survey protocols from Appendix C and D of the *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012a).

Measure 4.5.1b (NT/F): If burrowing owls are discovered in the proposed project site vicinity during construction, the onsite biologist shall be notified immediately. Occupied burrows should not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by the CDFW verifies through non-invasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

If this criteria is not met, occupied burrows during the nesting season will be avoided by establishment of a no-work buffer of 250-foot around the occupied/active burrow. Where maintenance of a 250-foot no-work buffer zone is not practical, the project applicant shall consult with the CDFW to determine appropriate avoidance measures. Burrows occupied during the breeding season (February 1 to August 31) will be closely monitored by the biologist until the young fledge/leave the nest. The onsite biologist shall have the authority to stop work if it is determined that construction related activities are disturbing the owls.

If criterion 1 or 2 above are met and as approved by CDFW, the biologist shall undertake passive relocation techniques by installing one-way doors in active and suitable burrows allowing owls to escape but not re-enter. Owls should be excluded from the immediate impact zone and within a 160-foot buffer zone by having one-way doors placed over the entrance to prevent owls from inhabiting those burrows.

Outside of the nesting season (August 31 through January 31st), passive relocation techniques shall take place. Construction activities may occur once a qualified biologist has deemed the burrows are unoccupied.

Measure 4.5.1c (NT/F): Prior to initiating construction activities at any proposed project site containing suitable habitat, a qualified biologist shall conduct a pre-construction survey for horned lark, Swainson's hawk, raptors, and other protected and migratory bird species. The survey shall be conducted to identify any active nests located within the construction area or up to 0.5 mile from the construction area. In addition, all trees slated for removal shall be surveyed by a qualified biologist no more than 48-hours before removal to ensure that no nesting birds are occupying the tree. If possible, trees slated for removal shall be removed starting September 1st through the end of February, outside of the nesting season.

If active nests are found during the survey, the applicant shall implement appropriate mitigation measures to ensure that the species will not be adversely affected, which will include establishing a no-work buffer zone as, approved CDFW, around the active nest. The no-work buffer may vary depending on species and site specific conditions as approved by CDFW. Appropriate mitigation measures include delaying construction activities until a qualified biologist determines that juveniles have fledged the nest(s), or establishing a "no construction" zone buffer around the nest.

The results of the survey shall be documented in a letter report that is distributed to the CDFW and the City of Fresno. These measures shall ensure compliance with the Migratory Bird Treaty Act and Fish and Game Code 3503.5.

Significance After Mitigation: Less than Significant

Impact 4.5.2: Implementation of the proposed project could result in potential disturbance or loss of valley elderberry longhorn beetle and its host plant, the elderberry shrub. (Significant)

Near Term and Future Project Elements

Suitable habitat (elderberry plants) for the valley elderberry longhorn beetle is present within the project area along the Fresno Canal (near-term project elements), but may also be present elsewhere within the project area. Construction and maintenance activities as part of the implementation of near-term project elements (lining and dredging the canal, and installation of the year-round maintenance road) may result in direct and/or indirect impacts to elderberry shrubs. Near-term and future construction activities could result in the direct removal or trimming of shrubs, as well as impact shrubs indirectly through changes in microtopography, dust generation, soil compaction, and application of herbicides and/or mowing thereby reducing the availability of viable elderberry shrubs for use by the beetle. Permanent losses of shrubs could occur in areas where permanent structures are placed and temporary losses or indirect impacts to shrubs could occur where areas are disturbed and then returned to pre-existing conditions. Therefore, construction of proposed project facilities would result in a significant impact.

Mitigation Measures

Implementation of the following mitigation measure would reduce this impact to a less-than-significant level because surveys would be conducted prior to construction activities and additional protection measures would be implemented to avoid, reduce, and/or compensate for loss of elderberry plants.

> **Measure 4.5.2 (NT/F):** Prior to initiating construction activities at any project site, a qualified biologist shall conduct a pre-construction survey for the presence of the valley elderberry longhorn beetle and its elderberry host plant in accordance with USFWS protocols. If elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level occur on or adjacent to the project site, or are otherwise located where they may be directly or indirectly affected by the proposed project, minimization and compensation measures, which include transplanting existing shrubs and planting replacement habitat (conservation plantings), are required (see below). Surveys are valid for a period of two years. No mitigation is required for the removal of elderberry stems measuring less than one inch in diameter, measured at ground level.
>
> For shrubs with stems measuring 1.0 inch or greater, the project proponent shall ensure that elderberry shrubs within 100 feet of proposed development be protected and/or compensated for in accordance with the *U.S. Fish and Wildlife Services' (USFWS) Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS, 1999a) and the *Programmatic Formal Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle Within the Jurisdiction of the Sacramento Field Office* (USFWS, 1996).
>
> **Significance After Mitigation:** Less than Significant

Impact 4.5.3: Implementation of the proposed project could result in potential disturbance or loss of western pond turtle and its habitat. (Significant)

Near Term and Future Project Elements

The proposed project area may provide suitable habitat for the western pond turtle. Within areas encompassing near-term project elements, suitable aquatic and nesting habitat occurs along the Fresno Canal and other irrigation ditches. Project activities such as ground disturbance, equipment and material staging, and use of access roads could impact waterways and movement corridors used by western pond turtles. Construction and maintenance activities could result in direct and/or indirect impacts to upland and aquatic habitats. These impacts could cause direct mortality or impact nesting activities. As a result, construction of proposed project facilities within the proposed project area has the potential to result in significant impacts to this species.

Future project elements have a similar potential to impact western pond turtle if future project elements traverse waterways (irrigation canals) and other aquatic habitat. It is expected that future project elements would have a lower degree of impact to western pond turtle because this species would most likely inhabit areas with a permanent water sources, such as the Fresno Canal. Future project elements would occur in more urbanized areas with fewer open water features or water features that do not provide high quality habitat for this species.

Potentially significant impacts to this species are expected to occur during the implementation of near-term project elements because this species is most likely to occur within the Fresno Canal and other agricultural water ways. While less likely due to the decreased quality of habitat, impacts to the western pond turtle could also occur during the implementation of future project elements. Therefore, construction of proposed project facilities would result in a significant impact to western pond turtles and their habitat.

Mitigation Measures

Implementation of the following mitigation measure would reduce this impact to *a* less-than-significant level because surveys would be conducted to prior to construction activities and additional protection measures would be implemented to remove turtles from the work area if they are present.

> **Measure 4.5.3 (NT/F):** No more than two weeks prior to the commencement of ground-disturbing activities a qualified biologist shall perform surveys for western pond turtle within suitable aquatic and upland habitat on the project site. Surveys shall include western pond turtle nests as well as individuals. The biologist (with the appropriate agency permits or approvals) shall temporarily move any identified western pond turtles upstream of the construction site, and temporary barriers shall be placed around the construction site to prevent ingress.
>
> Construction shall not proceed until the work area is determined to be free of turtles and their nests. The biologist will be responsible for moving adult turtles that enter the construction zone after construction has begun. If a nest is located within a work area, the biologist [with the appropriate permits or approvals from the California Department of Fish

and Wildlife (CDFW)] may move the eggs to a suitable facility for incubation, and release hatchlings into the original habitat in late fall. The biologist shall be present on the project site during initial ground clearing and grading and during all other construction activities adjacent to drainages with the potential to support western pond turtle.

The results of these surveys shall be documented in a technical memorandum that shall be submitted to the CDFW (if turtles are documented) and/or the City.

Significance After Mitigation: Less than Significant

Impact 4.5.4: Implementation of the proposed project could result in potential disturbance or loss of San Joaquin kit fox and its habitat. (Significant)

Near Term and Future Project Elements

The San Joaquin kit fox may use the drainage ditches, irrigation canals, and agricultural lands within the proposed project area. Suitable dens and foraging habitat could be removed or disturbed during construction and maintenance activities including ground surface blading, grading and subsurface trenching, tree removal, storage of trench spoils and/or equipment, or pipeline installation. Indirect impacts may result from construction activities that are located near a kit fox den resulting from noise, vibration, compaction or entrapment. Additionally, movement patterns may be temporarily impacted by an increase in human activity and alteration of habitat. Permanent losses of habitat could occur in areas where permanent structures are placed and temporary losses or indirect impacts to habitat could occur where areas are disturbed and then returned to pre-existing conditions. Therefore, construction of the proposed project facilities could result in significant impacts to this species.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to *a* less-than-significant level because surveys would be conducted to prior to construction activities and additional protection measures would be implemented to protect dens in the work area if they are present.

Measure 4.5.4a (NT/F): To ensure that impacts to the San Joaquin kit fox and its habitat are avoided or reduced, the following measures shall be implemented:

Preconstruction surveys for the San Joaquin kit fox shall be conducted no less than two calendar weeks and no more than thirty calendar days prior to commencement of ground disturbance. Surveys shall be conducted by qualified biologists. When surveys identify potential dens (defined as burrows at least four inches in diameter which open up within two feet), potential den entrances shall be dusted for three calendar days to register and track activity of any San Joaquin kit fox present. If no San Joaquin kit fox activity is identified, the den may be destroyed.

If San Joaquin kit fox activity is identified, then dens shall be monitored for at least five consecutive days from the time of observation to determine if occupation is by an adult fox only or is a natal den (natal dens usually have multiple openings). If the den is occupied by an adult only, it may be destroyed when the adult fox has moved or is temporarily absent.

If the den is a natal den, a buffer zone of 250 feet shall be maintained around the den and as approved by the USFWS. This buffer zone will be maintained until the biologist determines that the den has been vacated. Where San Joaquin kit fox are identified, the provisions of the USFWS's published *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS, 1999b) shall apply (except that preconstruction survey protocols shall remain as established in this paragraph). These standards include provisions for educating construction workers regarding the kit fox, keeping heavy equipment operating at safe speeds, checking construction pipes for kit fox occupation during construction and similar low or no-cost activities.

Measure 4.5.4b (NT/F): All excavated, steep-walled holes or trenches more than two feet deep shall be covered at the close of each working day by plywood or similar materials or provided with one or more escape ramps constructed of earth-full or wooden planks.

Significance After Mitigation: Less than Significant

Impact 4.5.5: Implementation of the proposed project could result in potential disturbance or loss of American badger and its habitat. (Significant)

Near Term and Future Project Elements

The proposed project area may include suitable breeding and foraging habitat for the American badger. Suitable burrows and foraging habitat could be removed or disturbed during construction and maintenance activities including ground surface blading, grading and subsurface trenching, storage of trench spoils and/or equipment, or pipeline installation. Removal of these habitats could reduce availability of suitable denning and foraging habitat to the American badger. Permanent losses of habitat could occur in areas where permanent structures are placed and temporary losses of habitat could occur where areas are disturbed and then returned to pre-existing conditions. Therefore, construction of proposed project facilities could result in significant impacts to this species.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level because surveys would be conducted to prior to construction activities and additional protection measures would be implemented to protect burrows in the work area if they are present.

Measure 4.5.5 (NT/F): To ensure that impacts to the American badger and their habitat are avoided or reduced, the following measures shall be implemented:

- A qualified biologist shall conduct a training session for all construction personnel focused on the protection and conservation of protected, non-listed special-status wildlife species, including American badgers. At a minimum, the training shall include a species and habitat description for the American badger (in addition to other non-listed special-status species). The training session shall identify the general measures that are being implemented to minimize impacts on these species as they relate to the project, and the boundaries within which the project could be accomplished.
- Concurrent with other required surveys, during winter/spring months before new project activities, and concurrent with other preconstruction surveys (e.g., kit fox and burrowing owl), a qualified biologist shall perform a pre-activity survey to identify the presence of American badgers. If this species is not found, no further mitigation shall be required. If badgers are identified, they shall be passively relocated using burrow exclusion (e.g., installing one-way doors on burrows) or similar CDFW-approved exclusion methods. In unique situations it might be necessary to actively relocate badgers (e.g., using live traps) to protect individuals from potentially harmful situations. Such relocation could be performed with advance CDFW coordination and concurrence. When unoccupied dens are encountered outside of work areas but within 100 feet of proposed activities, vacated dens shall be inspected to ensure they are empty and temporarily covered using plywood sheets or similar materials.
- If badger occupancy is determined at a given site within the work area, the construction manager should be informed that work should be halted. Depending on the den type, reasonable and prudent measures to avoid harming badgers will be implemented and may include seasonal limitations on project construction near the site (i.e., restricting the construction period to avoid spring-summer pupping season), and/or establishing a construction exclusion zone around the identified site, or resurveying the den a week later to determine species presence or absence.
- To minimize the possibility of inadvertent badger mortality, project-related vehicles shall observe a maximum 20 miles per hour speed limit on private roads.
- To prevent accidental entrapment of badgers or other animals during construction, all excavated holes or trenches greater than 2 feet deep shall be covered at the end of each work day by suitable materials, or escape routes constructed of earthen materials or wooden planks shall be provided. Before filling, such holes shall be thoroughly inspected for trapped animals.
- All food-related trash items (such as wrappers, cans, bottles, and food scraps) shall be disposed of in closed containers and removed daily from the project area.
- To prevent harassment and mortality of badgers or destruction of their dens, no pets shall be allowed in the project area.

Significance After Mitigation: Less than Significant

Impact 4.5.6: Proposed project activities could result in potential disturbance or loss of Western mastiff bat and hoary bat and their habitat. (Significant)

Near Term and Future Project Elements

The study area may include suitable breeding and foraging habitat for Western mastiff bat, hoary bat, and other bat species. Roosting sites within densely foliaged trees could be removed or disturbed during construction and maintenance activities including tree removal and tree trimming/crushing. Nesting behavior may be impacted from construction activities that are located near a roosting site resulting from noise and vibration. Construction of proposed project facilities within the proposed study area has the potential to result in significant impacts to this species.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level because surveys would be conducted to prior to construction activities and additional protection measures would be implemented to protect active bat roosts in the work area if they are present.

Measure 4.5.6 (NT/F): To ensure that impacts to the special-status bat species and their habitat are avoided or reduced, the following measures shall be implemented:

- Before construction activities (i.e., ground clearing and grading, including trees removal) within 200 feet of trees that could support special-status bats, a qualified bat biologist shall survey for special-status bats. If no evidence of bats (i.e., direct observation, guano, staining, or strong odors) is observed, no further mitigation shall be required.
- If evidence of bats is observed, the City of Fresno and its contractors shall implement the following measures to avoid potential impacts on breeding populations:
- A no-disturbance buffer of 250-feet shall be created around active bat roosts during the breeding season (April 15 through August 15). Bat roosts initiated during construction are presumed to be unaffected by the indirect effects of noise and construction disturbances. However, the direct take of individuals will be prohibited.
- Removal of trees showing evidence of active bat activity shall occur during the period least likely to affect bats, as determined by a qualified bat biologist (generally between February 15 and October 15 for winter hibernacula, and between August 15 and April 15 for maternity roosts). If the exclusion of bats from potential roost sites is necessary to prevent indirect impacts due to construction noise and human activity adjacent, bat exclusion activities (e.g., installation of netting to block roost entrances) shall also be conducted during these periods.

Significance after Mitigation: Less than Significant

Impact 4.5.7: Implementation of the proposed project could result in significant effects to rare or special-status plants and their habitat. (Significant)

Near Term Project Elements

Suitable habitat for the California satintail, San Joaquin adobe sunburst, and Sandford's arrowhead is present within the project area. Individual plants or suitable habitat could be removed or disturbed during construction and maintenance activities including ground surface blading, grading**,** dredging, and tree or shrub removal. These activities may result in indirect impacts to special-status plant species through changes in microtopography, dust generation, soil compaction, application of herbicides, and/or mowing. Removal of individual plants or suitable habitat could reduce local populations and contribute to habitat fragmentation and has the potential to result in significant impacts to this species.

Future Project Elements

Future project elements are not expected to impact the California satintail because this species has been observed from limited areas in the vicinity of the study area. Land clearing activities during the implementation of future project elements (such as installation of groundwater wells and pump stations) are not expected to result in significant impacts to this species. However, future project elements may have similar impacts to San Joaquin adobe sunburst and Sandford's arrowhead as these species have a greater range of distribution.

Summary

Potential significant impacts to California satintail is expected to occur during implementation of near term project elements. This would be a potentially significant impact without mitigation. Due to limited distribution, California satintail is not likely to be affected by construction and installation of future project elements. Potential significant impacts to San Joaquin adobe sunburst and Sandford's arrowhead are expected to occur during implementation of both near-term and future project elements. This would be a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level because surveys would be conducted to prior to construction activities and additional protection measures would be implemented to avoid, reduce, and/or replace special-status plants in the work area if they are present.

> **Measure 4.5.7a (NT/F):** Prior to construction, vegetated portions of the project site, including wetland habitats, shall be surveyed by a qualified botanist for the California satintail, San Joaquin adobe sunburst, Sandford's arrowhead, and other special-status plant species with the potential to occur in the project area. The survey(s) shall be conducted in accordance with established CDFW Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities (CDFG, 2009), which

calls for protocol-level surveys during the appropriate flowering/identification period for the species.

Measure 4.5.7b (NT/F): The following measures shall be implemented to compensate for the loss of special-status or rare plants identified on the project site:

- Avoid existing, known populations where possible;
- Minimize impacts by restricting removal of plants to a few individuals of a population where possible;
- Prepare a Mitigation and Monitoring Plan to relocate plants and/or seed banks or reintroduce new populations in suitable habitat and soil types within the on-site Preserve or at a CDFW or USFWS-approved off-site location;
- To the extent feasible/practical, restore project site locations that supported rare or special-status plants to its original condition.

Significance After Mitigation: Less than Significant

Impact 4.5.8: Implementation of the proposed project could result in the removal, filling, interruption or degradation of protected wetlands and other waters of the United States. (Significant)

Near Term and Future Project Elements

Wetlands and other waters of the United States could be affected through direct removal, filling, hydrological interruption (including dewatering), alteration of bed and bank, and other construction-related activities which could result in long-term degradation of federally or state-protected aquatic features and fragmentation or isolation of an important wildlife habitat Temporary or permanent impacts to wetlands and other waters of the United States during the implementation project facilities is considered a significant impact**.**

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level because applicable regulatory laws protecting these resources would be complied with, permits would be obtained, and additional protection measures would be implemented to avoid, reduce, and/or compensate for removal, filling, interruption or degradation of protected wetlands and other waters of the U.S. in the work area if they are present.

Measure 4.5.8a (NT/F): In order to protect and preserve wetland habitats within the proposed project area, the following measures shall be implemented:

- Prior to construction, a jurisdictional wetland delineation shall be prepared for verification by the Corps to determine the location and extent of waters of the U.S. and wetlands on and near Project Elements. Following the verification, if jurisdictional wetlands will be impacted, a Section 404 permit application shall be prepared and submitted to the Corps.
- The no net loss of wetland habitat and no significant impacts to potential jurisdictional features policy shall be complied with through compensation for the unavoidable

loss of wetlands at a ratio no less than 1:1. Compensation shall take the form of wetland preservation or creation in accordance with Corps and CDFW mitigation requirements, as required under project permits. Preservation and creation may occur onsite through a conservation agreement or offsite through purchasing credits at a Corps approved mitigation bank.

- In addition, the RWQCB regulates these features under Section 401 of the CWA; the City shall also apply for a Section 401 Water Quality Certification from the RWQCB prior to discharging fill in these features. Irrigation canals and potential wetlands within the proposed project area may be considered waters of the U.S. and fall under the jurisdictional purview of the Corps and/or RWQCB per Sections 401 and 404 of the CWA.

Significance After Mitigation: Less than Significant

Impact 4.5.9: Proposed project activities could result in the removal of street trees protected by the City of Fresno or oak woodland habitat located within Fresno County. (Significant)

Near Term and Future Project Elements

The proposed project area supports tree resources that are protected by the City of Fresno and Fresno County. Tree resources could be temporarily or permanently impacted as a result of project implementation; these impacts include tree removal, trimming, impacts to tree root system from grading and trenching activities, compaction from material storage, and water quality impacts. This is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level because surveys would be conducted to prior to construction activities and additional protection measures would be implemented to avoid, reduce, and/or replace protected or sensitive tree resources in the work area if they are present.

Measure 4.5.9a (NT/F): Sensitive tree resources adjacent to construction activities may require additional protection. The following measures shall protect trees to be retained onsite during construction of the proposed project:

- A Tree Protection Zone (TPZ) shall be established around any tree or group of trees to be retained. The formula typically used is defined as 1.5 times the radius of the dripline or 5 feet from the edge of any grading, whichever is greater. The TPZ may be adjusted on a case-by-case basis after consultation with a certified arborist.
- The TPZ of any protected trees shall be marked with permanent fencing (e.g., post and wire or equivalent), which shall remain in place for the duration of construction activities in the area. Post "keep out" signs on all sides of fencing.
- Construction-related activities, including grading, trenching, construction, demolition, or other work shall be prohibited within the TPZ. No heavy

equipment or machinery shall be operated within the TPZ. No construction materials, equipment, machinery, or other supplies shall be stored within a TPZ. No wires or signs shall be attached to any tree. Any modifications must be approved and monitored by a certified arborist.

- Prune selected trees to provide necessary clearance during construction and to remove any defective limbs or other parts that may pose a failure risk. All pruning shall be completed by a certified arborist or tree worker and adhere to the *Tree Pruning Guidelines* of the International Society of Arboriculture.
- The TPZs of protected trees shall be monitored on a weekly basis.
- A certified arborist shall monitor the health and condition of the protected trees and, if necessary, recommend additional mitigations and appropriate actions. This shall include the monitoring of trees adjacent to project facilities in order to determine if construction activities (including the removal of nearby trees) would affect protected trees in the future.
- Provide supplemental irrigation and other care, such as mulch and fertilizer, as deemed necessary by a certified arborist. Any injuries shall be treated by a certified arborist.

Measure 4.5.9b (NT/F): the City shall comply with the Fresno Municipal Code (F.M.C. 11-305) if protected street trees are proposed for removal.

Significance After Mitigation: Less than Significant

Impact 4.5.10: Proposed project activities could potentially result in disturbance or loss of riparian habitat and/or lake or streambed alteration through direct and indirect impacts. (Significant)

Near Term and Future Project Elements

Proposed project activities such as water intakes and conveyance pipeline construction, use of staging areas, and use and establishment of access roads may result in the removal or trimming of riparian habitat (trees and/or shrubs), as well as direct impacts to the bed and banks of streams, creeks and other waterways occupied by riparian habitat. Implementation of the proposed project has the potential to result in the loss or disturbance of riparian habitat and /or lake or streambeds. This is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by protecting riparian habitat through obtaining a streambed alteration agreement with the CDFW.

Measure 4.5.10 (NT/F): In order to protect and preserve riparian habitats and/or lake or streambeds within the proposed project area, the following measures shall be implemented:

The City of Fresno shall obtain a Section 1602 Streambed Alteration Agreement prior to implementing any action that may alter a stream or lake within the jurisdictional limits of CDFW (typically the top of bank or edge of riparian habitat, whichever is greater).

Significance After Mitigation: Less than Significant

Impact 4.5.11: Proposed project activities could potentially interfere with wildlife movement corridors through direct and indirect impacts. (Significant)

Near Term Project Elements

A wildlife movement corridor occurs within areas encompassing near-term project elements and includes the Fresno Canal and associated habitats along the canal. Project activities such as intake and conveyance pipeline construction, use of staging areas, and use and establishment of access roads may result in indirect or direct impacts to habitats along this wildlife movement corridor. Implementation of the proposed project has the potential to result in temporary disturbance of riparian, open water (riverine), and other habitats along the corridor.

Future Project Elements

Future project elements are expected to have a less than significant impact to wildlife movement corridors because no other significant wildlife movement corridors have been identified within the project area.

Summary

Potential significant impacts to wildlife movement corridors are expected to occur during the implementation of near-term project elements. However, no impacts to wildlife movement corridors are expected during future term project elements due to lack of other significant movement corridors within the project area. Therefore, this is considered a significant impact for near term project elements.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by protecting riparian and other habitats along the Fresno Canal during project implementation.

Measure 4.5.11 (NT): Implement Mitigation Measures 4.5.8, 4.5.9, and 4.5.10.

Significance After Mitigation: Less than Significant

The cumulative context for biological resources impacts includes the City of Fresno, its SOI, and the southern Central Valley.

Impact 4.5.12: Implementation of the proposed project, when combined with development of other future projects, could contribute to the cumulative loss or degradation of habitat or species protected under federal, State and local regulations. (Significant)

Near Term and Future Project Elements

Construction of current and future projects in the City of Fresno and southern Central Valley would include earth disturbing activities that could contribute to the progressive loss or degradation of habitat or species protected under federal, State and local regulations. This would result in a significant cumulative impact. The proposed project would involve earth-disturbing activities during construction of facilities which would cumulatively contribute considerably to this significant cumulative impact

Mitigation Measures

Implementation of the following mitigation measures would reduce the project's contribution to less than considerable; therefore, this cumulative impact would be less than significant because surveys would be conducted to prior to construction activities and additional protection measures would be implemented to avoid, reduce, and/or replace protected or sensitive biological resources in the work area if they are present.

Measure 4.5.12 (NT/F): Implement Measures 4.5.1 through 4.5.11.

Significance After Mitigation: Less than Significant

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4.6 Transportation

This section addresses potential traffic and circulation impacts on the basis of information provided in the City of Fresno General Plan (City of Fresno 2002a), the City of Fresno General Plan EIR (City of Fresno, 2002b), the California Department of Transportation (Caltrans), and the 2014 Traffic Impact Study (TIS) prepared for the proposed project[1] which is included as Appendix G to this Draft EIR.

The following were considered in the assessment of potential impacts:

- Review and evaluation of the City of Fresno General Plan and General Plan EIR to determine the characteristics of roads that are proposed to accommodate construction-generated vehicle trips. Characteristics include the number of vehicle lanes, traffic control, on-street parking (permitted or prohibited), public transit service, bicycle routes, and land uses served by the affected roads (e.g., sensitive uses like fire stations, schools, etc.).
- Estimated highest number of vehicle trips that project-related activities would generate, on both a daily and peak-hour basis.

No comments addressing transportation were received in response to the NOP (see Appendix B).

4.6.1 Environmental Setting

The proposed project is located within the City of Fresno (and in areas outside the city limits in Fresno County). The transportation system in the project area is comprised of an interconnected network of roadways, local transit systems, and pedestrian and bicycle facilities. Four state highways provide regional and interregional connectivity: State Routes (SR) 41, 99, 168, and 180. A series of major arterial roads within the City connect to collector roads that function to link neighboring land uses.

Regional Roadway Network

State Route 41 is a north-south freeway that connects the City of Fresno northward to Rolling Hills and beyond (to Yosemite National Park), and southward to Easton and beyond (to Morro Bay). In the City of Fresno, SR 41 has six to eight lanes, and access is limited to on- and off-ramps (at SR 99, SR 180, and local roads). According to published data (Caltrans, 2009), the average daily traffic (ADT) volume ranges from 14,000 to 34,500 vehicles (south of SR 99), 76,000 to 131,000 vehicles (between SR 99 and SR 180), and 73,000 to 149,000 vehicles (north of SR 180).

State Route 99 is a freeway aligned northwest-southeast that connects the City of Fresno northward to Madera and beyond (to Red Bluff) and southward to Kingsburg and beyond (to Bakersfield). In the City of Fresno, SR 99 has six lanes, and access is limited to on- and off-ramps (at SR 41, SR 180, and local roads). According to published data (Caltrans, 2009), the ADT volume ranges from 48,500 to 108,000 vehicles (south of SR 41), and 65,000 to 125,000 vehicles (north of SR 180).

[1] Traffic Impact Study – Proposed City of Fresno Southeast Surface Water Treatment Facility, Fresno, California, Peters Engineering, January 2014.

State Route 168 is a freeway generally aligned northeast-southwest that connects the City of Fresno to Clovis to the northeast. In the City of Fresno, SR 168 has four to six lanes, and access is limited to on- and off-ramps (at SR 180, and local roads). According to published data (Caltrans, 2009), the ADT volume decreases as one travels north, ranging from 82,000 to 25,000 vehicles.

State Route 180 is an east-west roadway of varying character (freeway and non-freeway sections) that connects the City of Fresno eastward to Squaw Valley and beyond (to Kings Canyon National Park) and westward to Kerman and beyond (to Mendota). In the City of Fresno, SR 180 has six to eight lanes, and access is limited to on- and off-ramps (at SR 41, SR 99, SR 168, and local roads). According to published data (Caltrans, 2009), the ADT volume likewise varies greatly, ranging from 22,000 vehicles (west of SR 99), 84,000 to 158,000 vehicles (between SR 99 and SR 168), and 51,000 to 90,000 vehicles (east of SR 168).

Local Roadway Network

The City of Fresno General Plan maintains the classifications listed in Table 4.6-1 for streets and highways within the City. The proposed project would place pipelines within the right-of-way (ROW) of Arterials, Collectors, and Local Roadways. Where the pipeline would cross Freeways, Expressways, or Superarterials, directional drilling would be used to ensure that pipeline would be installed without necessitating the closure of travel lanes.

TABLE 4.6-1
ROADWAY CLASSIFICATIONS FOR THE CITY OF FRESNO

Classification	Description
Freeway	Multiple-lane divided roadways primarily servicing through and cross town traffic, with no access to abutting property and no at-grade intersections.
Expressway	Four- to six-lane divided roadways primarily servicing through and cross town traffic, with no direct access to abutting property and at-grade intersections located at approximately half-mile intervals.
Superarterial	Four- to six-lane divided roadways with a primary purpose of moving traffic to and from major traffic generators and between community plan areas. A select number of access points to adjacent properties or local streets between the major street intersections may be approved by the City of Fresno. Access will typically be limited to right-turn entrance and exit vehicular movements. Special circumstances, as determined by the City of Fresno, may justify a median island opening between intersections which allow left-turn movement from the superarterial street to an adjoining property or local street.
Arterial	Four- to six-lane divided roadways, with somewhat limited access to abutting properties, and with the primary purpose of moving traffic within and between community plan areas and to and from freeways and expressways. In addition to major street intersections, appropriately designed and spaced local street intersections may allow left-turn movements to and from the arterial streets, subject to approval by the City of Fresno.
Collector	Two- to four-lane undivided roadways, with the primary function of connecting local streets and arterials and neighborhood traffic generators and providing access to abutting properties.
Local	Two- to three-lane public or private roadways designed to provide direct access to properties while discouraging through traffic between major streets. Local streets are typically not planned by the 2025 Fresno General Plan Land Use and Circulation Map and the Transportation Element (Streets and Highways) Map but existing local streets may be shown for informational purposes on this exhibit.

SOURCE: City of Fresno, *2025 Fresno General Plan*, *Public Facilities Element*, February 2002.

SE SWTF Project Study Area Intersections

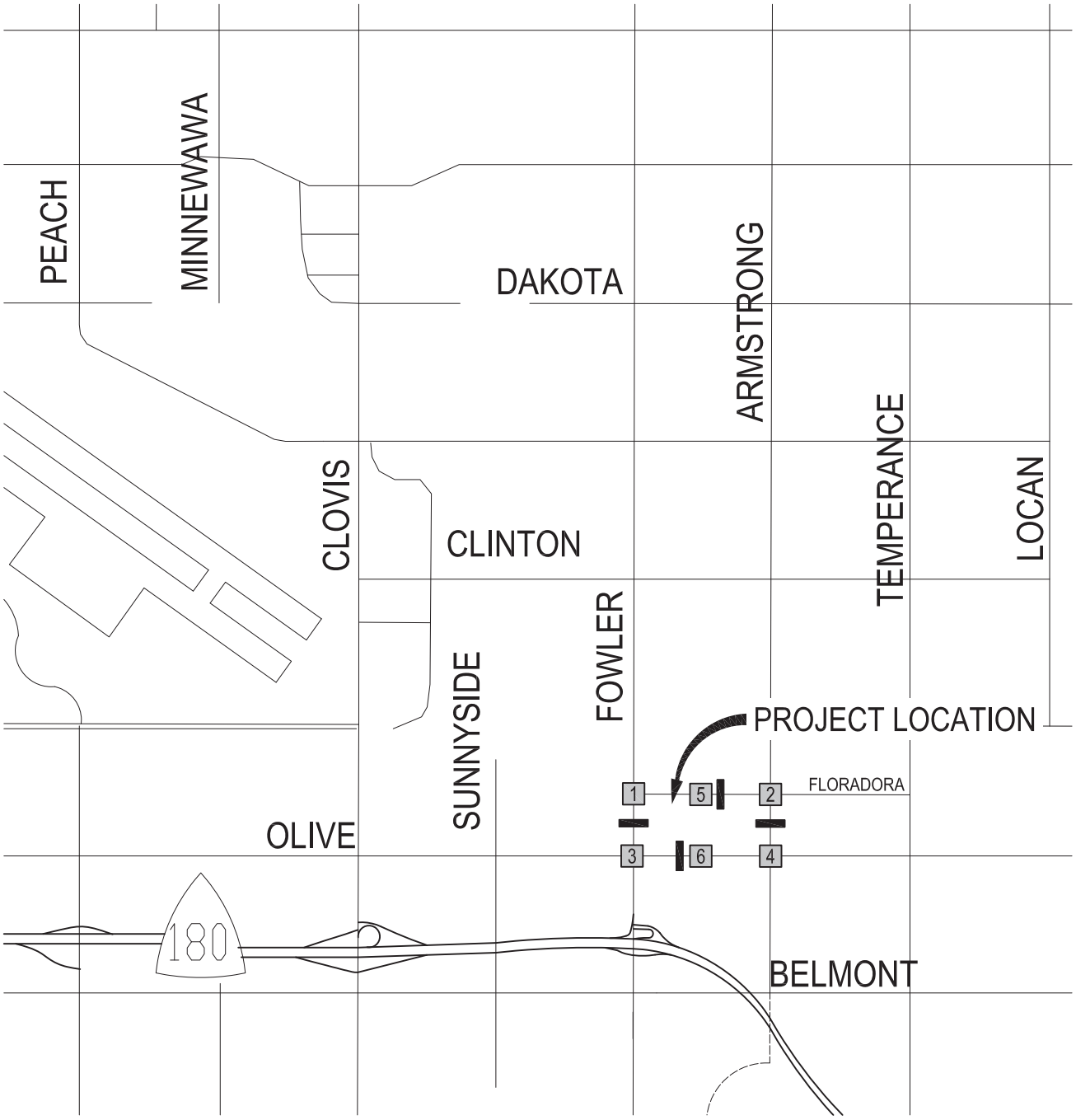
The Project study area includes four existing intersections and four existing road segments. The SE SWTF location, study intersections, and study road segments are illustrated in Figure 4.6-1 (TIS Figure 1-3). The existing lane configurations and intersection control at the study intersections are illustrated in Figure 4.6-2 (TIS Figure 4-1). A description of the four major roadways near the SE SWTF site is described below.

Fowler Avenue is under the jurisdiction of the County of Fresno in the vicinity of the SE SWTF but is within the City of Fresno SOI. Fowler Avenue is a north-south roadway extending from the County line near Laton at its southern end to the City of Clovis and beyond to the north, with a discontinuous section in Fowler. In the vicinity of the SE SWTF, Fowler Avenue consists of one 11- to 12-foot-wide lane in each direction with a posted speed limit of 45 miles per hour. The 2025 Fresno General Plan designates Fowler Avenue as an arterial (four lanes with a median). Traffic counts performed for the TIS indicated a weekday 24-hour volume of 12,261 vehicles on Fowler Avenue between Olive and Floradora Avenues.

Armstrong Avenue is under the jurisdiction of the County of Fresno in the vicinity of the SE SWTF but is within the City of Fresno SOI. Armstrong Avenue is a north-south roadway extending from Fancher Creek at the southern end through the City of Clovis to Teague Avenue at its northern end. In the vicinity of the SE SWTF, Armstrong Avenue consists of one 10- to 11-foot-wide lane in each direction. The only speed limit signs observed in the vicinity of the Project site are 25-miles-per-hour school speed limits when children are present adjacent to Temperance Kutner Elementary School. The 2025 Fresno General Plan designates Armstrong Avenue as a collector (typically one lane in each direction with a two-way left-turn lane down the center). Traffic counts performed for the TIS indicated a weekday 24-hour volume of 3,079 on Armstrong Avenue between Olive and Floradora Avenues.

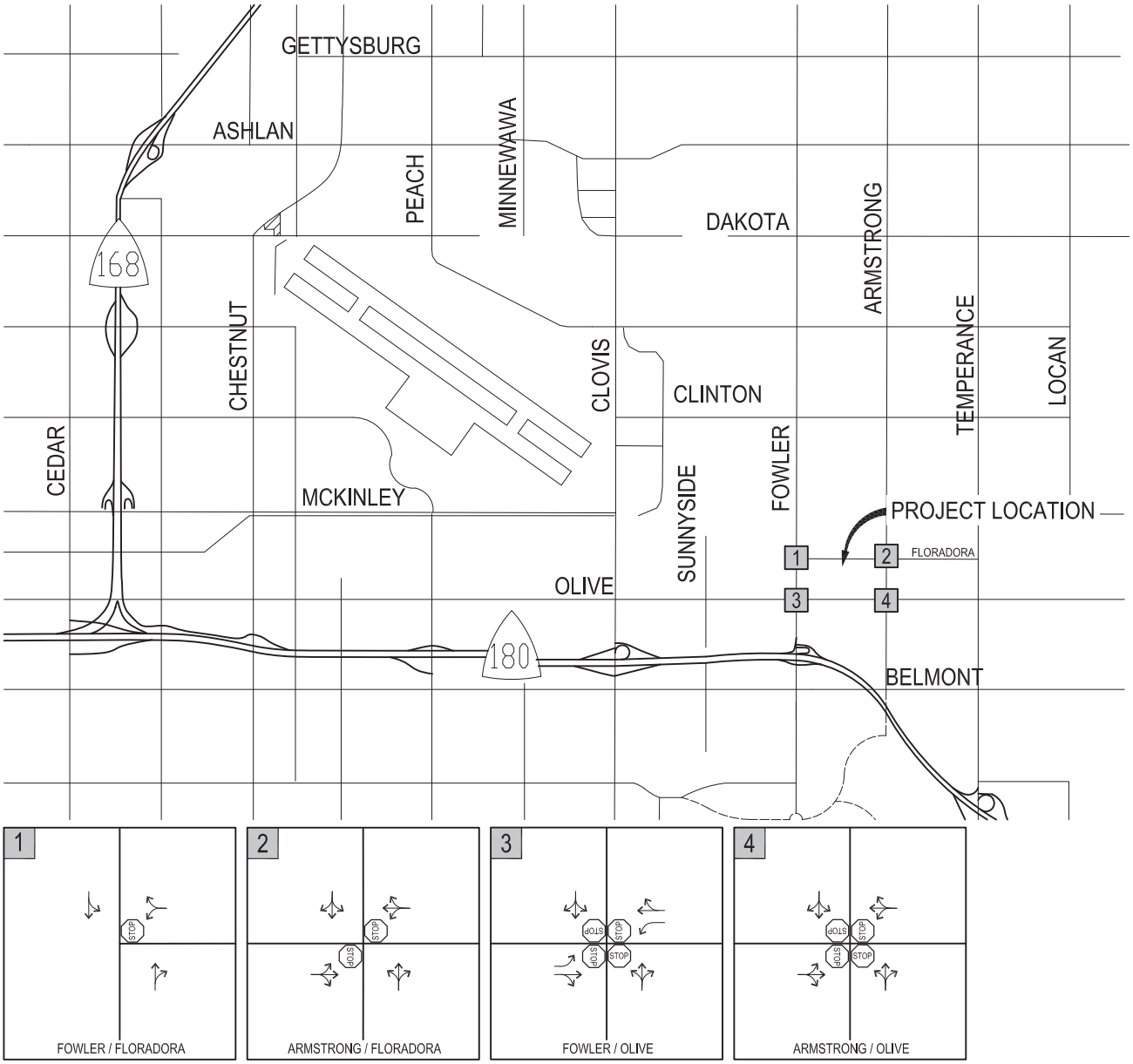
Olive Avenue is under the jurisdiction of the County of Fresno in the vicinity of the SE SWTF but is within the City of Fresno SOI. Olive Avenue is an east-west roadway extending from Garfield Avenue at its western end through the City of Fresno to Fancher Avenue at its eastern end. In the vicinity of the SE SWTF, Olive Avenue consists of one 12-foot-wide lane in each direction with a posted speed limit of 45 miles per hour. A 25-miles-per-hour school speed limit exists when children are present adjacent to Temperance Kutner Elementary School. The 2025 Fresno General Plan designates Olive Avenue as a collector (typically one lane in each direction with a two-way left-turn lane down the center). Traffic counts performed for the TIS indicated a weekday 24-hour volume of 4,969 on Olive Avenue between Fowler and Armstrong Avenues.

Floradora Avenue is under the jurisdiction of the County of Fresno in the vicinity of the SE SWTF but is within the City of Fresno SOI. In the vicinity of the SE SWTF, Floradora Avenue is an east-west roadway extending from Fowler Avenue at its western end to Temperance Avenue at its eastern end. This segment of Floradora Avenue consists of one 10- to 11-foot-wide lane in each direction. There are no posted speed limits. Traffic counts performed for the TIS indicated a weekday 24-hour volume of 160 of Floradora Avenue between Fowler and Armstrong Avenues.



SOURCE: Peters Engineering Group, 2013; ESA, 2013

Figure 4.6-1
Study Intersections and Road Segments



SOURCE: Peters Engineering Group, 2013; ESA, 2013

Figure 4.6-2
Existing Lane Configurations and Intersection Control

The 2025 Fresno General Plan does not designate Floradora Avenue as a major street and it is; therefore, considered a local road. However, plan lines have been developed by the City that could result in the McKinley Avenue being extended east of Clovis Avenue and curving down to overlap the segment of Floradora Avenue between Fowler and Armstrong Avenues. Although McKinley Aveune is designated as an arterial street (four lanes with a median), the plan lines call out a collector configuration (typically one lane in each direction with a two-way left-turn lane down the center).

Truck Access

The City of Fresno developed a truck route plan, effective September 25, 2005 (City of Fresno, 2005). The plan designates truck routes within Fresno to provide contractors with the preferred travel roadways to and from connecting local roadways. Local roadways should not be used in place of adjacent truck routes unless otherwise noted on Fresno's truck route plan. Fresno County has not developed a similar system of truck routes for unincorporated areas.

Traffic Operating Conditions

Traffic operating conditions on roadways (and at intersections) are analyzed based on Level of Service (LOS), which is a qualitative description of a facility's performance based on various parameters, including average delay per vehicle, vehicle density, or volume-to-capacity ratio. There are six levels of LOS, ranging from LOS A, which indicates free-flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays. The City of Fresno requires that LOS D or better be maintained, with the exception of constrained locations identified in the General Plan (City of Fresno, 2002a). Fresno County requires that LOS C or better be maintained, except within the sphere of influence of the City of Fresno, where LOS D is acceptable. Table 4.6-2 and 4.6-3 provides the Transportation Research Board's description of LOS A through LOS F for both unsignalized and signalized intersections.

TABLE 4.6-2
LEVEL OF SERVICE CHARACTERISTICS FOR UNSIGNALIZED INTERSECTIONS

LOS	Average Vehicle Delay (seconds)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

SOURCE: Transportation Research Board, *Highway Capacity Manual, Transportation Research Board, 2010*

TABLE 4.6-3
LEVEL OF SERVICE CHARACTERISTICS FOR SIGNALIZED INTERSECTIONS

LOS	Description	Average Vehicle Delay (seconds)
A	Volume-to-capacity ratio is low. Progression is exceptionally favorable or the cycle length is very short.	<10
B	Volume-to-capacity ratio is low. Progression is highly favorable or the cycle length is very short.	>10-20
C	Volume-to-capacity ratio is no greater than 1.0. Progression is favorable or cycle length is moderate.	>20-35
D	Volume-to-capacity ratio is high but no greater than 1.0. Progression is ineffective or cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	>35-55
E	Volume-to-capacity ratio is high but no greater than 1.0. Progression is unfavorable and cycle length is long. Individual cycle failures are frequent.	>55-80
F	Volume-to-capacity ratio is greater than 1.0. Progression is very poor and cycle length is long. Most cycles fail to clear the queue.	>80

SOURCE: Transportation Research Board, *Highway Capacity Manual, Transportation Research Board, 2010*

Public Transportation

Rail Service

The Amtrak's San Joaquin line operates passenger rail service between Bakersfield and either Oakland or Sacramento. In the proposed project area, the San Joaquin line generally runs parallel to the northeast side of SR 180. The Union Pacific Transportation Company (UPTC) and the Burlington Northern Santa Fe (BNSF) railroad provide freight service in the project area, connecting Fresno with major markets in California and the nation. The UPTC and BNSF lines that cross Fresno share right-of-way (ROW) with Amtrak.

Bus Service

The bus service provider for the City of Fresno is the Fresno Area Express (FAX). FAX operates multiple routes that span each of the City's four quadrants. FAX routes are found on most arterials and collectors within the City and include some of the roads currently under consideration for pipeline installation as a part of the proposed project (see descriptions of local roadway network, above).

Bicycle and Pedestrian Facilities

Bikeways are typically classified as Class I, Class II, or Class III facilities. Class I bikeways are bike paths with exclusive rights-of-way for bicyclists and pedestrians, and with minimal cross flow by motorized vehicles. Class II bikeways are bike lanes striped within the paved areas of roadways, established for the preferential use of bicycles. Class III bikeways are signed bike routes that allow bicycles to share streets or sidewalks with vehicles or pedestrians. Many of the roadways within the proposed project area have Class II bike lanes or Class III Bike Routes (City of Fresno, 2009).

Pedestrian facilities consist of sidewalks along roadways, and crosswalks, and pedestrian signals at intersections. Many of the roadways within the proposed project area have sidewalks, and all signalized intersections have crosswalks and pedestrian signals.

4.6.2 Regulatory Setting

State

California Department of Transportation

Caltrans manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulation of the use of state roadways. The project area includes four roadways that falls under Caltrans' jurisdiction (i.e., SR 41, 99, 168, and 180).

Caltrans' construction practices require temporary traffic control planning "during any time the normal function of a roadway is suspended". In addition, Caltrans requires that permits be obtained for transportation of oversized loads and transportation of certain materials, and for construction-related traffic disturbance. Caltrans regulations would apply to construction of the proposed project (Caltrans, 2006).

Local

County of Fresno General Plan

The Transportation and Circulation Element of the Fresno County General Plan provides the framework for Fresno County decisions concerning the countywide transportation system, which includes various transportation modes and related facilities. It also provides for coordination with the cities and unincorporated communities within the county, with the Regional Transportation Plan adopted by the Fresno Council of Governments, Highway 99 beautification, and with State and Federal agencies that fund and manage transportation facilities within the county. The following goals and policies are relevant to the proposed project:

Policy TR-A.2	Level of Service: The County shall plan and design its roadway system in a manner that strives to meet Level of Service (LOS) D on urban roadways within the spheres of influence of the cities of Fresno and Clovis and LOS C on all other roadways in the county. In addition to consideration of the total overall needs of the roadway system, the County shall consider the following factors: b. Construction and right-of-way acquisition costs
Policy TR-A.19	Minimize Road Construction Impacts: The County should utilize road construction methods that minimize the air, water, and noise pollution associated with street and highway development. *(PSP/SO)*

City of Fresno General Plan

The City of Fresno General Plan does not include circulation policies or goals that address temporary construction traffic, temporary lane closures, or temporary bike lane/parking lane closures (City of Fresno, 2002a).

City of Fresno Department of Public Works

The City of Fresno Department of Public Works Traffic Engineering Division requires a Traffic Control Plan for any project that includes lane closures, partial road closures, and road closures

with detours. An encroachment permit is required for any work to be performed in the roadway ROW. The Traffic Engineering Division also requires Transportation Permits for wide loads and multiple trips generated.

Funding for Transportation Projects

The City of Fresno has established a Traffic Signal Mitigation Impact Fee (TSMI) that funds known traffic signal improvements (updated Aug. 29, 2008). The improvements are estimated to be constructed by 2025. Projects within the City of Fresno (infill and new growth areas) mitigate their fair share of cumulative impacts requiring traffic signals by paying into the fee program. The current fee is $47.12 per ADT. The following projects are included in the TSMI fee:

- Fowler/Olive (with dual lefts identified); and
- Armstrong /Olive.

The City of Fresno has also established a Fresno Major Street Impact Fee (FMSI) that funds known street segment improvements (March 17, 2007). The improvements are estimated to be constructed by 2025. Projects within the City of Fresno (infill and new growth areas) mitigate their fair share of cumulative impacts requiring roadway improvements by paying into the fee program. The current fee is $11,837 per net acre for Light Industrial land use areas in New Growth Areas (proposed land use under the 2025 General Plan). The following projects are included in the FMSI fee:

- Fowler Avenue – Clinton Avenue to Olive Avenue (median along with center & outside travel lanes);
- Armstrong Avenue – Clinton Avenue to Olive Avenue (center & outside travel lanes); and
- Olive Avenue – Fowler Avenue to Armstrong Avenue (center & outside travel lanes).

Projects within the City of Fresno mitigate their fair-share of cumulative impacts by paying into the fee program and/or constructing the improvements and receiving credits and reimbursements for the portion of construction that is included in the fee program. As a general matter, under the TSMI and FMSI fee programs, a developer is required to construct street or traffic signal improvements subject to fee credits and reimbursements when a project triggers the need for the facility, or causes the substandard LOS. Where intersections are located with the City SOI, the TSMI fee provides funding only for the percentage of the intersection located in the SOI; therefore, at such locations the improvement would not be fully implemented through the TSMI fee.

4.6.3 Impacts and Mitigation Measures

Method of Analysis

Project Construction

The intensity and nature of the construction activity would vary over the construction period, and the number of vehicle trips generated by that activity would similarly vary. Vehicle trips would

be generated primarily by construction workers, trucks hauling materials to and from the site, and equipment delivery traffic (including delivery of pipe). The number of workers at any one site would vary depending upon the type of construction activity and project. Based on estimates of manpower per task and the experience of similar construction projects, there would be approximately 5 to 15 workers per crew on an average day.

Construction of both near-term and future project elements includes upgrades to the existing NE SWTF and construction of the proposed new SE SWTF and SW SWTF, a conveyance pipeline to the proposed new SE SWTF, transmission pipelines, storage tanks, groundwater wells, and groundwater recharge areas. Construction of the proposed project would involve excavation and structural foundation installation, equipment installation, and final site restoration. Excavated soil is expected to be reused onsite as much as possible, with no off-site hauling or disposal anticipated.

Pipeline installation and Conveyance Option 2 would involve open trenching with some locations (under freeways, busy intersections, railroad lines, or waterways) requiring jack-and-bore tunneling or directional drilling. Pipelines would be installed generally within the existing roadway ROW. Trenching within roadways would use a conventional cut and cover construction technique. The trench, depending on the pipe size, could be up to approximately 16 feet deep and approximately 10 feet wide, though some smaller-diameter pipes would require smaller trenches. The construction corridor would require a minimum of 40 foot easement to allow for staging areas and vehicle access. Construction staging areas would be identified by the contractor for pipe lay-down, soil stockpiling, and equipment storage. On average, 200 feet of pipeline could be installed per day which would require between 80 and 100 construction vehicle trips. Trenches would be temporarily closed at the end of each work day, by covering with steel trench plates and installing barricades to restrict access to staging areas.

Jack and bore tunneling is used for installing underground pipelines short distances without disturbing the ground surface. Temporary bore pits and receiving pits are excavated on either side of the segment. A jacking pit typically measures as little as 10 feet by 5 feet, up to approximately 30 feet by 10 feet. The temporary pits typically would be excavated to a depth of 5 to 20 feet, as needed. Pipeline installation by this method would require approximately one to two weeks per crossing; excavated soils would be retained onsite for backfill. Horizontal directional drilling could be used for traversing underneath highways or waterways. Pipeline installation by this method would require approximately one to two weeks per segment crossing. All excavated soils would be retained onsite.

At various locations within pipeline construction zones, staging areas would be required to store pipe, construction equipment, and other construction-related items, and to accommodate parking of construction worker vehicles. Staging areas could be used for the duration of the project, or could be moved as pipeline construction moves along the route to minimize hauling distances and avoid disrupting any one area for extended periods of time.

Project Operations

It is not anticipated that implementation of the proposed project would require large numbers of new employees. In addition to new employees, the proposed SE SWTF would involve the relocation of existing City employees associated with the relocation of Water Division administrative and

corporation yard facilities. Maintenance and inspection of pipelines, pipeline appurtenances, and storage tanks would occur irregularly and infrequently. Operation and maintenance of the proposed upgrades to the existing NE SWTF and the new SW SWTF would not require a significant number of new employees and such would be contained within the boundaries of the treatment plant sites. Other future term facilities, such as the ground water wells and groundwater recharge basins would not require staff to operate and would only require infrequent maintenance trips. Overall operation and maintenance of both near-term and future project elements would not result in substantial increase in traffic in the project area; nevertheless, a TIS (see Appendix G) was prepared to investigate potential traffic impacts resulting from relocation of the City of Fresno Water Division Corporation Yard and Water Division administrative offices to the proposed SE SWTF.

SE SWTF Operational Trip Generation

Data provided in the Institute of Transportation Engineers (ITE) Trip Generation, 8th Edition, are typically used to estimate the number of trips anticipated to be generated by proposed projects. However, there is no data provided for water treatment plants or City corporation yards. Trip generation estimates were based on anticipated numbers of employees and shift schedules based on existing City operations. Table 4.6-4 presents a summary of the daily and peak-hour trip generation estimates for the proposed SE SWTF (peak hours occur between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m.). Internal trip reductions and pass-by trip reductions are not applicable to the proposed project and are not considered in the analyses.

When the traffic study was prepared it was anticipated that the SE SWTF would be completed in 3 distinct phases (Phase 1: 40 mgd treatment plant and operations building; Phase 2: 40 mgd expansion to a 80 mgd treatment plant; and Phase 3: relocation of Water Division corporation yard and administrative offices); however, as currently envisioned, construction of all improvements, including construction of the 80 mgd SE SWTF and relocation of the Water Division Corporation Yard and administrative offices would all occur under one phase. As a result, the analysis presented in this EIR considers buildout of the proposed SE SWTF as one phase (Phase 1-3 combined) as the Plus Project condition.

As shown in Table 4.6-4, with the relocation of the Water Division Corporation Yard and administrative uses to the proposed SE SWTF, the number of employees traveling to and from the site would substantially increase (832 additional daily trips). Many of those employees would arrive before 7:00 a.m. and pick up a City vehicle and leave the site after 7:00 a.m. in City vehicles. Those same City vehicles would typically return and the employees would leave the site in their personal vehicles before 4:00 p.m.

TABLE 4.6-4
PROPOSED SE SWTF TRIP GENERATION

Project Operation Scenario	Daily	A.M. Peak Hour			P.M. Peak Hour		
		In	Out	Total	In	Out	Total
80 mgd SWTF	40	9	3	12	3	9	12
Full Buildout	872	81	172	253	5	81	86

SOURCE: Peters Engineering Group, 2014. Proposed City of Fresno Southeast Surface Water Treatment Facility, Traffic Impact Study, Table 8.1

SE SWTF Project Trip Distribution and Assignment

The regional distribution of traffic from the proposed SE SWTF was estimated by performing a select zone analysis using available traffic models performed by Council of Fresno County Governments (COG). COG performed a select zone analysis of the traffic analysis zone (TAZ) that includes the SE SWTF site based on the land uses assumed in the 2035 Fresno County travel model. The select zone analysis was used to estimate the regional distribution of employee trips entering and exiting the site. The trips generated by the corporation yard (i.e., City work trucks leaving the site in the morning and returning to the site in the afternoon) were distributed manually assuming a relatively even distribution of traffic throughout the City of Fresno. The percentage distribution of SE SWTF traffic is presented in Figure 4.6-3 (TIS Figure 8-1).

The peak-hour traffic volumes presented above in Table 4.6-4 were assigned to the study intersections and road segments in accordance with the trip distribution percentages described above. The peak-hour Project traffic volumes for Phases 1 through 3 are presented in Figure 4.6-4 (TIS Figure 8-3).

SE SWTF Operations Analysis Scenarios

The following SE SWTF operational scenarios were evaluated:

- Existing Plus Project Conditions
- Cumulative (2035) Plus Project Conditions
- Cumulative (2035) Plus Project Conditions (with McKinley realignment).

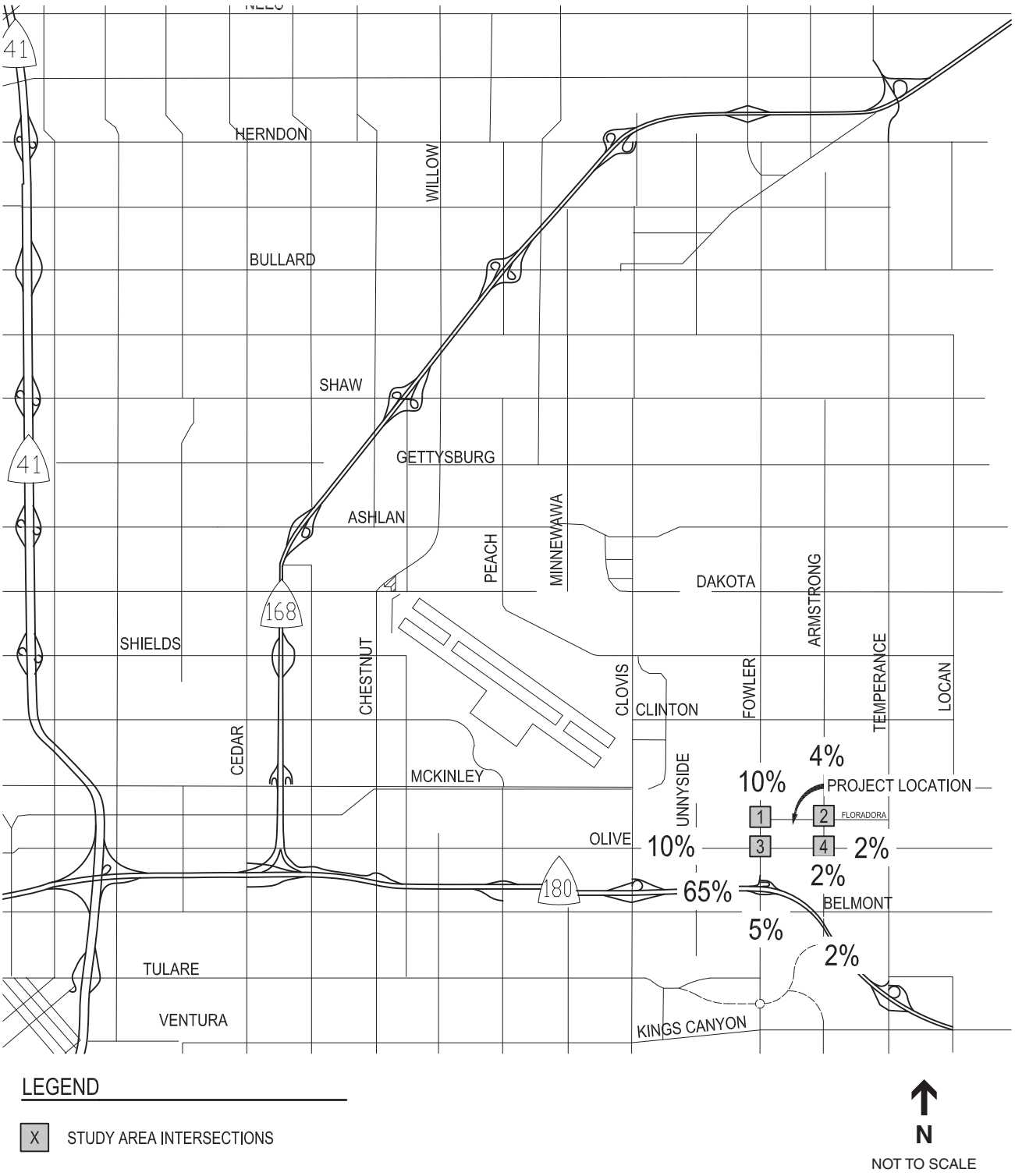
The cumulative (2035) condition includes approved and pending near-term projects presented in Table 5.1 of the TIS.

The study intersections and road segments were determined based on the anticipated volume and distribution of proposed SE SWTF traffic. A scoping letter dated March 29, 2012 was provided to local agencies and the scope of the study was finalized based on the responses received (Appendix B). The traffic analysis is limited to the intersections affected by operation of the SE SWTF which are the following intersections:

1. Fowler and Floradora Avenues
2. Armstrong and Floradora Avenues
3. Fowler and Olive Avenues
4. Armstrong and Olive Avenues
5. Floradora Avenue and Site Access
6. Olive Avenue and Site Access

The TIS includes analysis of the following road segments:

1. Fowler Avenue between Floradora and Olive Avenues
2. Armstrong Avenue between Floradora and Olive Avenues
3. Floradora Avenue between Fowler and Armstrong Avenues
4. Olive Avenue between Fowler and Armstrong Avenues



SOURCE: Peters Engineering Group, 2013; ESA, 2013

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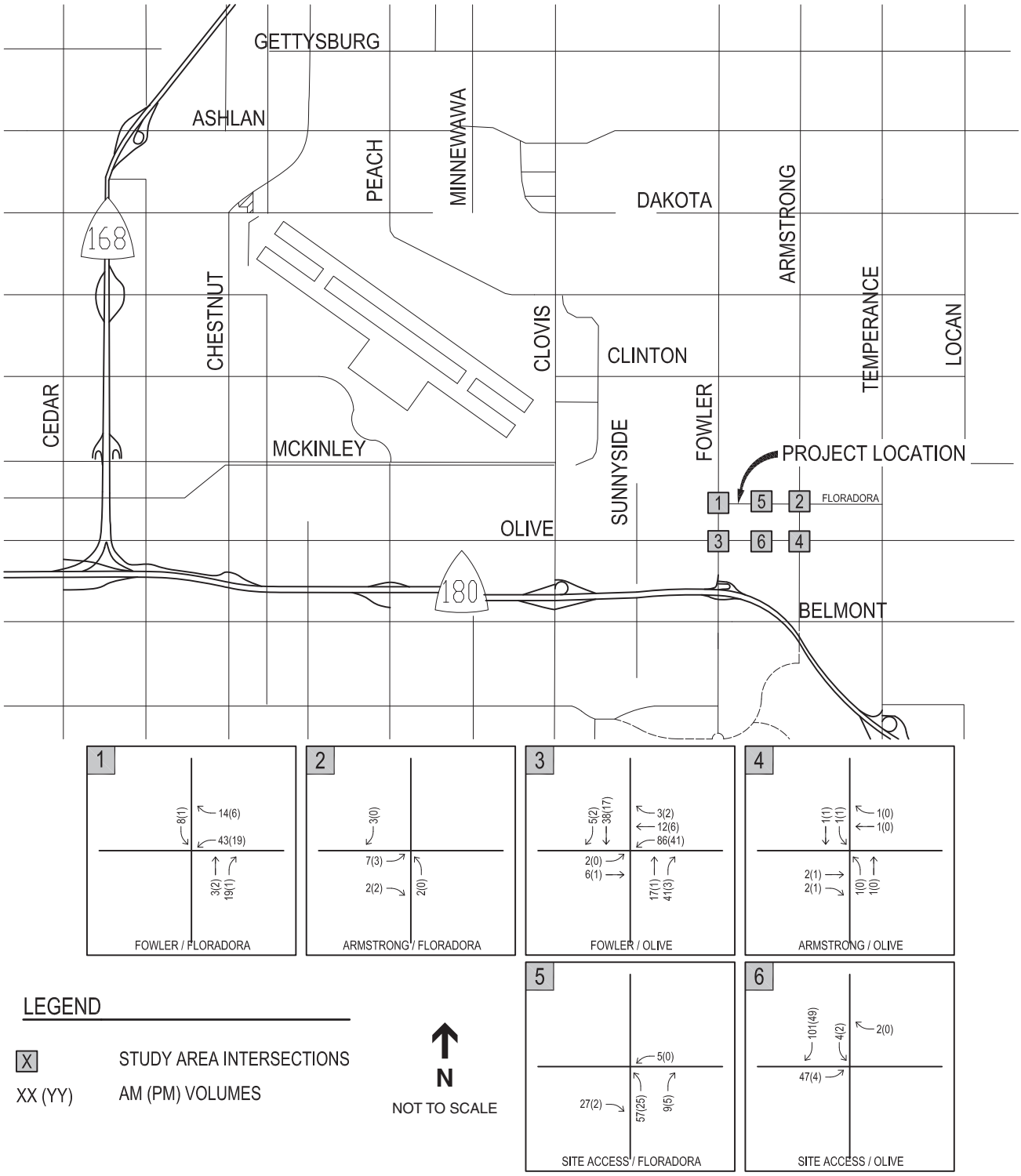
Figure 4.6-3

Project Traffic Distribution Percentage



SOURCE: Peters Engineering Group, 2013; ESA, 2013

Figure 4.6-4

Peak-Hour Project Phases 1 Through 3 Traffic Volumes

Standards of Significance

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;
- Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that would result in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Impacts Not Further Evaluated

Changes in air patterns. The proposed project does not involve air traffic, and therefore, would not have the potential to change air traffic patterns at any airport in the project area (i.e., Fresno Yosemite International Airport, Chandler Downtown Executive Airport or Sierra Sky Park Airport). No impact would occur and this issue will not be further evaluated in the EIR.

Conflicts with adopted plans, policies, or programs supporting alternative transportation. The proposed project would not generate an increase in transit demand nor eliminate alternative transportation corridors or facilities (e.g., bike paths or lanes, bus turnouts) during service hours, and would not involve permanent changes in any roadways or changes in policies or programs that support alternative transportation. The short-term effects of construction activities on transit service are discussed under Impacts 4.6.1 and 4.6.2.

As described on page 4.6-7, the Amtrak's San Joaquin line generally runs parallel to the northeast side of SR 180. In addition, the Union Pacific Transportation Company and the Burlington Northern Santa Fe railroads operate through Fresno, sharing the San Joaquin ROW with Amtrak. The proposed projects include pipeline routes that would cross the San Joaquin ROW. However, bore-and-jack or directional drilling techniques would be used to install pipelines underneath railroad tracks. This construction technique involves tunneling beneath railroad tracks without compromising their stability or restricting rail activity. Therefore, the proposed projects would not affect rail service or operation. No impact would occur and this issue will not be further evaluated in the EIR.

Impacts and Mitigation Measures

Table 4.6-5 provides a summary of the impact analysis for issues related to transportation and circulation.

TABLE 4.6-5
PROPOSED PROJECT IMPACT SUMMARY – TRANSPORTATION

	Near-Term Project Elements		Future Project Elements	
Impact	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.6.1 Project construction activities would intermittently and temporarily increase traffic congestion due to vehicle trips generated by construction workers and construction vehicles on area roadways.	S	LS	S	LS
Impact 4.6.2 Reduction in the number of, or the available width of, travel lanes on roads where pipeline construction would occur, would result in short-term traffic delays for vehicles traveling past the construction zones	S	LS	S	LS
Impact 4.6.3 Project construction would potentially cause traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways	S	LS	S	LS
Impact 4.6.4 Project construction activities would intermittently and temporarily impede access to local streets or adjacent uses (including access for emergency vehicles), as well as disruption to bicycle/pedestrian access and circulation.	S	LS	S	LS
Impact 4.6.5: Under Existing Plus Project Conditions operation of the proposed SE SWTF would result in an increase in vehicle trips that could exceed levels of service standards for surrounding roadways.	S	LS	NA	NA
Impact 4.6.6 Under Cumulative (2035) Plus Project Conditions without the McKinley Road realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways.	S	SU	NA	NA
Impact 4.6.7 Under Cumulative (2035) Plus Project Conditions with the McKinley Avenue realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways.	S	SU	NA	NA
Impact 4.6.8 Construction of the proposed project, in combination with construction projects could temporarily increase traffic congestion, result in short-term traffic delays, and create traffic hazards.	S	LS	S	LS

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less-than-significant Impact
NA = Not Applicable

Impact 4.6.1: Project construction activities would intermittently and temporarily increase traffic congestion due to vehicle trips generated by construction workers and construction vehicles on area roadways. (Significant)

Near-Term and Future Project Elements

Based on a preliminary estimate of the amount of material that would be excavated and filled along the pipeline segments, plus estimates of daily materials delivery and construction workers, approximately 80 to 100 vehicle trips are anticipated to occur per day during the construction period. Construction work crews for other project facilities, such as the SWTF's, storage tanks, groundwater wells, and recharge basins are highly variable, and daily worker vehicle trips to and from each work site would vary. Given the assumption that all soils excavated for the other facilities such as the SWTF's, storage tanks, groundwater wells, and recharge basins would be retained onsite, the number of truck trips per day per site would be lower than the above-mentioned estimate for pipeline installation. Earthwork estimates and truck trip estimates would be developed once construction plans are prepared.

Construction-generated traffic would be temporary and would not result in long-term degradation in operating conditions on area roadways or at area intersections. Project-generated truck trips would be spread over the course of the work day, and construction workers would commute to and from the worksite primarily before or after peak traffic hours. Construction-related truck traffic occurring on two-lane roadways providing access to the construction sites would have the greatest potential to impede traffic flow. The primary impact from construction truck traffic would be a temporary and intermittent reduction of roadway capacities due to the slower movements of trucks compared to passenger vehicles. Public transit lines could be affected by truck movements. Drivers could experience delays if they were traveling behind a construction truck. Limiting truck movements to the hours between 9:00 a.m. and 3:30 p.m. would minimize disruption of the general traffic flow on affected roadways during the a.m. and p.m. peak hours.

Because traffic disruption and increased delays could occur during project construction, and given the lack of certainty about the identification and timing of other projects, and specifically what other projects would be constructed during construction of the project, this is considered a significant impact**.**

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by requiring that the City coordinate with the appropriate local government departments, and with utility districts and agencies regarding the timing of construction activities. In addition, project contractors would be required to obtain roadway encroachment permits and to develop and implement traffic control plans.

> **Measure 4.6.1a (NT/F):** Prior to construction, the City of Fresno and its contractor(s) shall coordinate with the appropriate local government departments, and with utility districts and agencies regarding the timing of construction projects that would occur near project sites. Specific measures to mitigate potential significant impacts would be determined as part of the interagency coordination, and could include measures such as employing flaggers during

key construction periods, designating alternate haul routes, and providing more outreach and community noticing.

Measure 4.6.1b (NT/F): The following requirements shall be incorporated into contract specifications prepared by the City for the project:

- The contractor(s) will obtain any necessary road encroachment permits prior to construction and will comply with conditions of approval attached to project implementation. As part of the road encroachment permit process, the contractor(s) will submit a traffic safety / traffic management plan (for work in the public right-of-way) to the agencies having jurisdiction over the affected roads. Elements of the plan will likely include, but are not necessarily limited to, the following:
    - Develop circulation and detour plans to minimize impacts to local street circulation. Use haul routes minimizing truck traffic on local roadways to the extent possible. Use flaggers and/or signage to guide vehicles through and/or around the construction zone.
    - Control and monitor construction vehicle movements through the enforcement of standard construction specifications by periodic onsite inspections.
    - To the extent feasible, and as needed to avoid adverse impacts on traffic flow, schedule truck trips outside of peak morning and evening commute hours.
    - Limit lane closures during peak hours to the extent possible. Delays would also be experienced by drivers during off-peak hours, but because of the lower volume, fewer people would be affected by the delays during those periods. Restore roads and streets to normal operation by covering trenches with steel plates outside of allowed working hours or when work is not in progress.
    - Limit, where possible, the pipeline construction work zone to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone. Parking may be prohibited if necessary to facilitate construction activities or traffic movement. If the work zone width will not allow a 10-foot-wide paved travel lane, then the road will be closed to through-traffic (except emergency vehicles) and detour signing on alternative access streets will be used.
    - Include signage to direct pedestrians and bicyclists around project construction work zones that displace sidewalks and/or bike lanes.
    - Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite, in such a manner to minimize obstruction to traffic.
    - Comply with roadside safety protocols. Provide “Road Work Ahead” warning signs and speed control (including signs informing drivers of state-legislated double fines for speed infractions in a construction zone) to achieve required speed reductions for safe traffic flow through the work zone.
    - Coordinate with facility owners or administrators of sensitive land uses such as police and fire stations, transit stations, hospitals, and schools. Provide advance notification to the facility owner or operator of the timing, location,

and duration of construction activities and the locations of detours and lane closures.

- Coordinate construction activities, to extent possible, to minimize traffic disturbances adjacent to schools (e.g., do work during summer months when there is less activity at schools). For construction activities that occur during the school year, then at the start and end of the school day at schools adjacent to a pipeline project, the contractor(s) will provide flaggers in the school areas to ensure traffic and pedestrian safety.
- Coordinate with the Fresno Area Express so the transit provider can temporarily relocate bus routes or bus stops in work zones as it deems necessary.
- To the extent feasible, and as needed to avoid adverse impacts on traffic flow, schedule construction of project elements to avoid overlapping maximum trip-generation construction phases.

Significance After Mitigation: Less than Significant

Impact 4.6.2 Reduction in the number of, or the available width of, travel lanes on roads where transmission pipeline installation would occur, would result in short-term traffic delays for vehicles traveling past the construction zones. (Significant)

Near-Term and Future Project Elements

Installation of transmission pipelines and proposed Conveyance Option 2 would occur in and across streets. The location of the proposed pipelines within the roadways would be dependent on existing utilities under the roadway, and would be identified during the design phase of the project. Existing transportation and circulation patterns in the vicinity of the proposed transmission pipeline alignments and the proposed Conveyance Option 2 alignment would be temporarily disrupted by construction activities and heavy equipment use. Impacts related to this project component would include direct disruption of traffic flows and street operations. Lane blockages or street closures during pipeline installation would result in a reduction in travel lanes and curb parking, and could result in the need for traffic re-routing. Public transit routes, and pedestrian and bicycle traffic would be disrupted during construction. In addition, access to businesses and residences would be disrupted. This is considered a significant impact. Table 4.6-6 presents pipeline installation effects on generalized roadway types that could be affected along pipeline corridors identified in the proposed project. Traffic would be delayed as it travels past, the construction zone, or on temporary detour routes.

TABLE 4.6-6
POTENTIAL CONSTRUCTION EFFECTS ON ROADS ALONG PIPELINE ALIGNMENTS

Lanes	Roadway Width	Roadway Disruptions	General Impacts
Local Streets			
2	paved width < 22 feet	Roadway closure.	• Temporary disruptions in access to adjacent land uses, consisting primarily of residential units, but also commercial establishments, schools, churches, and parks. • Temporary removal of bikeways, pedestrian walkways and crosswalks, causing disruptions to local pedestrian and bicycle traffic. • Disruptions to public transit routes which pipeline alignment extends along or crosses. • Temporary displacement of on-street parking.
2	22 feet ≤ paved width < 32 feet	Construction may require roadway closure, or alternate one-way travel may be maintained with use of traffic controls and removal of parking along both sides of roadway.	
2	32 feet ≤ paved width < 42 feet	Two travel lanes may be maintained with removal of parking on one side of roadway. Parking may need to be removed on both sides of the roadway depending on alignment of pipeline within roadway.	
2	paved width ≥ 42 feet	Two travel lanes may be maintained with potential for removal of parking on one side of roadway.	
Major/Secondary Thoroughfares			
4 lanes	paved width ≥ 50 feet	Two to three travel lanes may be maintained with potential for removal of parking on one or both sides of roadway.	• Construction within or across primary and secondary thoroughfares could adversely affect traffic flow on these roadways. • Temporary disruptions in access to adjacent land uses, consisting of mix of commercial uses, including restaurants, retail stores, offices, but also residential units, industrial land uses, schools, churches, and parks. • Temporary removal of bikeways, pedestrian walkways and crosswalks, causing disruptions to local pedestrian and bicycle traffic. • Disruptions to local and major public transit routes which pipeline alignment extends along or crosses, requiring re-routing of transit routes, relocation of bus stops, etc. • Temporary displacement of on-street parking.
4 lanes divided	total paved travel width > 66 feet	Three to four travel lanes may be maintained with potential for removal of parking on one side of roadway.	
6 lanes divided	total paved travel width ≥ 86 feet	Five to six travel lanes may be maintained with potential for removal of parking on one side of roadway.	

SOURCE: ESA, 2010

Mitigation Measures

Implementation of the following mitigation measures would ensure that effects on traffic flow conditions would be reduced to a less-than-significant level by requiring that the City coordinate with the appropriate local government departments, and with utility districts and agencies regarding the timing of construction activities. In addition, project contractors would be required to obtain roadway encroachment permits and to develop and implement traffic control plans.

Measure 4.6.2 (NT/F): Implement Mitigation Measure 4.6.1.

Significance After Mitigation: Less than Significant

Impact 4.6.3: Project construction would potentially cause traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways. (Significant)

Near-Term and Future Project Elements

The project would not alter the physical configuration of the existing roadway network serving the area and would not introduce unsafe design features, but construction-generated trucks on project area roadways would interact with other vehicles. Creation of a construction work zone on high-volume roadways would potentially create traffic safety hazards where traffic is routed into the travel lane adjacent to the work zone. Potential conflicts could also occur between construction traffic and bicyclists and pedestrians. This is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measure would reduce this impact to a less-than-significant level by requiring that the City coordinate with the appropriate local government departments, and with utility districts and agencies regarding the timing of construction activities. In addition, project contractors would be required to obtain roadway encroachment permits and to develop and implement traffic control plans.

Measure 4.6.3 (NT/F): Implement Mitigation Measure 4.6.1.

Significance After Mitigation: Less than Significant

Impact 4.6.4: Project construction activities would intermittently and temporarily impede access to local streets or adjacent uses (including access for emergency vehicles), as well as disruption to bicycle/pedestrian access and circulation. (Significant)

Near-Term and Future Project Elements

Transmission pipeline installation within or across streets, and temporary reduction in travel lanes, could result in delays for emergency vehicle access in the vicinity of the worksites. In addition, access to driveways and to cross streets along the construction route could be temporarily blocked due to trenching and paving. This could be an inconvenience to some and a significant problem for others, particularly schools and emergency service providers (e.g., police and fire). Vehicle access would be restored at the end of each workday through the use of steel trench plates or trench backfilling. Employees and customers would continue to have access to the affected business establishments; only access to parking (on- or off-street) adjacent to the business would be affected, and truck deliveries could be made difficult. With sufficient advance notification regarding the timing of construction in front of each affected property, this short-term inconvenience would result in a less-than-significant impact.

In addition, lane blockages or roadway closures during pipeline installation could result in temporary alterations in bicycle and pedestrian circulation; the specific location of the pipelines within each roadway is not yet known, but such blockages or closures would inconvenience bicyclists and pedestrians and is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by requiring advance notification on the timing of construction in front of each affected property.

Measure 4.6.4 (NT/F): Implement Mitigation Measure 4.6.1.

Significance After Mitigation: Less than Significant

Impact 4.6.5: Under Existing Plus Project Conditions operation of the proposed SE SWTF would result in an increase in vehicle trips that could exceed levels of service standards for surrounding roadways. (Significant)

As shown in Tables 4.6-7 and 4.6-8, all intersections and road segments would operate at an acceptable LOS under the Existing Plus Project Condition except for the Fowler/Olive intersection at full buildout of the SE SWTF. Vehicle trips associated with the relocation of the Water Division Corporation Yard and Administrative uses would result in the LOS at the intersection of Fowler and Olive to drop from LOS E to LOS F in the a.m. peak hour. In addition, the additional vehicle trips would exacerbate a substandard LOS F by more than 5 seconds during the p.m. peak hour. This is considered a significant impact.

TABLE 4.6-7
EXISTING PLUS PROJECT CONDITIONS A.M./P.M PEAK HOUR INTERSECTION ANALYSIS SUMMARY

	Existing Conditions		Existing Plus Project Conditions		
	LOS		LOS		Mitigation Measures
Intersection	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	
80 mgd SWTF					
Fowler / Floradora	B	C	B	C	None
Armstrong / Floradora	C	B	C	B	None
Fowler / Olive	E	F	E	F	None
Armstrong / Olive	C	A	C	A	None
Site Access / Floradora	-	-	A	A	None
Site Access / Olive	-	-	B	A	None
Full Buildout					
Fowler / Floradora	B	C	C	C	None
Armstrong / Floradora	C	B	C	B	None
Fowler / Olive	E	F	***F***	***F***	**4.6.5**
Armstrong / Olive	C	A	C	A	None
Site Access / Floradora	-	-	A	A	None
Site Access / Olive	-	-	B	A	None

SOURCE: Peters Engineering Group, 2014. Proposed City of Fresno Southeast Surface Water Treatment Facility, Traffic Impact Study, Tables 9.1, 9.2, 10.1, and 10.2.

TABLE 4.6-8
EXISTING PLUS PROJECT CONDITIONS A.M./P.M PEAK HOUR ROAD SEGMENT ANALYSIS SUMMARY

Road Segment	Existing Conditions LOS		Existing Plus Project Conditions LOS		
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	Mitigation Measures
80 mgd SWTF					
Fowler Avenue between Olive and Floradora	B	C	B	C	None
Armstrong Avenue between Olive and Floradora	B	B	B	B	None
Olive Avenue between Fowler and Armstrong	C	C	C	C	None
Floradora Avenue between Fowler and Armstrong	C	C	C	C	None
Full Buildout					
Fowler Avenue between Olive and Floradora	B	C	B	C	None
Armstrong Avenue between Olive and Floradora	B	B	B	B	None
Olive Avenue between Fowler and Armstrong	C	C	C	C	None
Floradora Avenue between Fowler and Armstrong	C	C	C	C	None

SOURCE: Peters Engineering Group, 2014. Proposed City of Fresno Southeast Surface Water Treatment Facility, Traffic Impact Study, Tables 9.3, 9.4, 10.3, and 10.4.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by requiring a signal be installed in accordance with City of Fresno standards and lane configurations.

Measure 4.6.5 (NT): Prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF the intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

- Eastbound: one left-turn lane and a shared through/right-turn lane
- Westbound: two left-turn lanes and a shared through/right-turn lane
- Northbound: one left-turn lane and a shared through/right-turn lane
- Southbound: one left-turn lane and a shared through/right-turn lane

To receive the two left-hand turn lanes west bound, a second southbound lane would be required south of Olive Avenue to tie into the existing portion of Fowler that has already been built.

With implementation of this mitigation the intersection would operate at LOS C and 95th percentile queues in the left-turn and right-turn lanes will be 219 feet or less. The maximum calculated 95th-percentile queue in the westbound left-turn lanes is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound dual left-turn lanes, which should provide a storage length of at least 319 feet.

Significance After Mitigation: Less than Significant

Impact 4.6.6: Under Cumulative (2035) Plus Project Conditions without the McKinley Road realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways. (Significant)

As shown in Tables 4.6-11 and 4.6-12, the proposed project would contribute under the Cumulative (2035) Plus Project Condition without the McKinley Road realignment to LOS violations at intersections and road segments in the project vicinity. This is considered a significant cumulative impact. Specifically, the proposed project would contribute to cumulative impacts under the Cumulative (2035) Plus Project Condition based on intersection LOS criteria at the following intersections:

- Fowler Avenue / Floradora Avenue: the a.m. peak hour LOS would drop from LOS E to LOS F and a substandard LOS F would be exacerbated by more than 5 seconds during the p.m. peak hour, peak hour traffic signal warrants would not be met;
- Armstrong Avenue / Floradora Avenue: a substandard LOS F would be exacerbated by more than 5 seconds during the a.m. and p.m. peak hours, and peak hour traffic signal warrants would not met;
- Fowler Avenue / Olive Avenue: a substandard LOS F would be exacerbated by more than 5 seconds during the a.m. and p.m. peak hours, and peak hour traffic signal warrants would not be met; and
- Armstrong Avenue / Olive Avenue: a substandard LOS F would be exacerbated by more than 5 seconds during the a.m. and p.m. peak hours, and peak hour traffic signal warrants would not be met.

The proposed project would also contribute to cumulative impacts based on road segment LOS criteria at the following road segments:

- Fowler Avenue between Olive and Floradora Avenues: the a.m. peak hour LOS would drop from LOS B to LOS E and the p.m. peak hour LOS would to drop from LOS C to LOS E;
- Armstrong Avenue between Olive and Floradora Avenues: the a.m. peak hour LOS would drop from LOS B to LOS E and the p.m. peak hour LOS would drop from LOS B to LOS E; and
- Olive Avenue between Fowler and Armstrong Avenues: the a.m. peak hour LOS would drop from LOS C to LOS F and the p.m. peak hour LOS would drop from LOS C to LOS F.

TABLE 4.6-11
CUMULATIVE (2035) PLUS PROJECT A.M./P.M PEAK HOUR INTERSECTION ANALYSIS SUMMARY

	Existing Conditions		Cumulative (2035) Plus Project Conditions		
	LOS		LOS		
Intersection	**AM Peak Hour**	**PM Peak Hour**	**AM Peak Hour**	**PM Peak Hour**	**Mitigation Measures**
Without McKinley Avenue Realignment					
Fowler / Floradora	B	C	***F***	***F***	4.6.6a
Armstrong / Floradora	C	B	***F***	***F***	4.6.6b
Fowler / Olive	E	F	***F***	***F***	4.6.6c
Armstrong / Olive	C	A	***F***	***F***	4.6.6d
Site Access / Floradora	-	-	A	A	None
Site Access / Olive	-	-	D	C	None
With McKinley Avenue Realignment					
Fowler / Floradora	B	C	***F***	***F***	4.6.7a
Armstrong / Floradora	C	B	***F***	***F***	4.6.7b
Fowler / Olive	E	F	***F***	***F***	4.6.7c
Armstrong / Olive	C	A	***F***	***F***	4.6.7d
Site Access / Floradora	-	-	C	C	None
Site Access / Olive	-	-	D	C	None

SOURCE: Peters Engineering Group, 2014. Proposed City of Fresno Southeast Surface Water Treatment Facility, Traffic Impact Study, Tables 13.1, 13.2, 14.1, and 14.2.

TABLE 4.6-12
CUMULATIVE (2035) PLUS PROJECT A.M./P.M PEAK HOUR ROAD SEGMENT ANALYSIS SUMMARY

	Existing Conditions		Cumulative (2035) Plus Project Conditions		
	LOS		LOS		
Road Segment	**AM Peak Hour**	**PM Peak Hour**	**AM Peak Hour**	**PM Peak Hour**	**Mitigation Measures**
Without McKinley Avenue Realignment					
Fowler Avenue between Olive and Floradora	B	C	***E***	***E***	4.6.6e
Armstrong Avenue between Olive and Floradora	B	B	***E***	***E***	4.6.6f
Olive Avenue between Fowler and Armstrong	C	C	***F***	***F***	4.6.6g
Floradora Avenue between Fowler and Armstrong	C	C	C	C	None
With McKinley Avenue Realignment					
Fowler Avenue between Olive and Floradora	B	C	***E***	***E***	4.6.7e
Armstrong Avenue between Olive and Floradora	B	B	***E***	***E***	4.6.7f
Olive Avenue between Fowler and Armstrong	C	C	***F***	***F***	4.6.7g
Floradora Avenue between Fowler and Armstrong	C	C	D	D	None

SOURCE: Peters Engineering Group, 2014. Proposed City of Fresno Southeast Surface Water Treatment Facility, Traffic Impact Study, Tables 13.3, 13.4, 4.13, and 14.4.

Mitigation Measures

Implementation of the following mitigation measures, which includes installation of new traffic signals, road segment improvements, and payment of the City of Fresno's TSMI and FMSI fees, would reduce project- related impacts to adversely affected intersections and road segments to a less-than-significant level. However, although payment of a fair share contribution to improvements is considered a feasible approach for mitigating project impacts, the timing of programmed improvements is estimated to be 2025 while the SE SWTF is estimated to be operational by 2018. Furthermore, the improvements recommended in Mitigation Measures 4.6.6 are to roads under the jurisdiction of Fresno County at this time and the timing of annexation from the SOI into the City Limits is unknown; therefore, the implementation of these improvements is outside of the City of Fresno's jurisdiction to construct. As a result, this impact would remain significant and unavoidable**.**

Measure 4.6.6a (NT): The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards improvements at the Fowler and Floradora Avenues intersection. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The widening shall be designed in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

- Eastbound: one shared left-turn/right turn land
- Westbound: does not exist
- Northbound: two through lanes with a shared right turn
- Southbound: one left-turn lane and two through lanes

All-way stop control would not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. With implementation of the improvements identified in this mitigation measure the intersection would continue to operate at LOS F during the a.m. and p.m. peak hours.

Measure 4.6.6b (NT): The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards improvements at the Armstong and Floradora Avenues intersection. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The widening shall be designed in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

- Eastbound: one shared left-turn/through/right-turn lane
- Westbound: one shared left-turn/through/right-turn lane
- Northbound: one left-turn lane and two through lanes with a shared right turn
- Southbound: one left-turn lane and two through lanes with a shared right turn

All-way stop control would not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. With implementation of the improvements identified in this mitigation measure

the eastbound and westbound approaches to the intersection would continue to operate at LOS F during a.m. and p.m. peak hours.

Measure 4.6.6c (NT): Implement Mitigation Measure 4.6.5.

Measure 4.6.6d (NT): The City of Fresno shall pay its fair share contribution of applicable TSMI and FMSI fees towards the signalization of the Armstong and Olive Avenues intersection. The signal shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The signal would be installed in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

- Eastbound: one left-turn lane and two through lanes with a shared right turn
- Westbound: one left-turn lane and two through lanes with a shared right turn
- Northbound: one left-turn lane, two through lanes, and one right-turn lane
- Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection would operate at LOS C during a.m. and p.m. peak hours. With the exception of the eastbound left-turn lane, 95th-percentile queues in the left-turn lanes will be 201 feet or less and 95th-percentile queues in right-turn lanes will be 92 feet or less. The maximum calculated 95th-percentile queue in the eastbound left-turn lane is 308 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound left-turn lane, which should provide a storage length of at least 308 feet.

Measure 4.6.6e (NT): The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards the widening of Fowler Avenue between Olive and Floradora Avenues to four lanes in accordance with City of Fresno standards. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF.

With implementation of this mitigation measure the road segment would operate at LOS D during both a.m. and p.m. peak hours. This configuration would conform to the City of Fresno General Plan and City of Fresno standards for a four-lane arterial.

Measure 4.6.6f (NT): The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards the widening of Armstrong Avenue between Olive and Floradora Avenues to four lanes in accordance with City of Fresno standards. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF.

With implementation of this mitigation measure the road segment would operate at LOS C during both a.m. and p.m. peak hours. This configuration would conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector.

Measure 4.6.6g (NT): The City of Fresno shall pay its fair share contribution of applicable FMSI fees towards the widening of Olive Avenue between Fowler and Armstrong Avenues to four lanes in accordance with City of Fresno standards. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF.

With implementation of this mitigation measure the road segment would operate at LOS C during both a.m. and p.m. peak hours. This configuration would conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector.

Significance After Mitigation: Significant and Unavoidable

Impact 4.6.7: Under Cumulative (2035) Plus Project Conditions with the McKinley Avenue realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways. (Significant)

As shown in Tables 4.6-11 and 4.6-12, the proposed project would contribute under the Cumulative (2035) Plus Project Condition with the McKinley Road realignment to LOS violations at intersections and road segments in the project vicinity. This is considered a significant cumulative impact. Specifically, the proposed project would contribute to cumulative impacts under the Cumulative (2035) Plus Project Condition based on intersection LOS criteria at the following intersections:

- Fowler Avenue / Floradora Avenue a substandard LOS F would be exacerbated by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met;
- Armstrong Avenue / Floradora Avenue: a substandard LOS F would be exacerbated by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met;
- Fowler Avenue / Olive Avenue: a substandard LOS F would be exacerbated by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met; and
- Armstrong Avenue / Olive Avenue: a substandard LOS F would be exacerbated by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met.

The proposed project would also contribute to cumulative impacts based on road segment LOS criteria at the following road segments:

- Fowler Avenue between Olive and Floradora Avenues: the a.m. peak hour LOS would drop from LOS B to LOS E and the p.m. peak hour LOS would drop from LOS C to LOS E;
- Armstrong Avenue between Olive and Floradora Avenues: the a.m. peak hour LOS would drop from LOS B to LOS E and the p.m. peak hour LOS would drop from LOS B to LOS E; and
- Olive Avenue between Fowler and Armstrong Avenues: the a.m. peak hour LOS would drop from LOS C to LOS F and the p.m. peak hour LOS would drop from LOS C to LOS F.

Mitigation Measures

Implementation of the following mitigation measures, which includes installation of new traffic signals, road segment improvements, and payment of the City of Fresno's TSMI and FMSI fees, described above, would reduce project- related impacts to adversely affected intersections and road segments to a less-than-significant level. However, although payment of a fair share contribution to improvements is considered a feasible approach for mitigating project impacts, the timing of programmed improvements is estimated to be 2025 while the SE SWTF is estimated to

be operational by 2018. Furthermore, the improvements recommended in Mitigation Measures 4.6.6 are to roads under the jurisdiction of Fresno County at this time and the timing of annexation from the SOI into the City Limits is unknown; therefore, the implementation of these improvements is outside of the City of Fresno's jurisdiction to construct. As a result, this impact would remain significant and unavoidable**.**

Measure 4.6.7a (NT): The City of Fresno shall pay its fair share contribution of applicable TSMI and FMSI fees towards improvements at the Fowler and Floradora (McKinley) Avenues intersection. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The intersection shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

- Eastbound: one left-turn land, one through lane, and one right-turn lane
- Westbound: two left-turn lanes, one through lane, and one right-turn lane
- Northbound: two left-turn lane and two through lanes, and one right-turn lane
- Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation measure the intersection would operate at LOS C during both a.m. and p.m. peak hours. The 95th-percentile queues in the left-turn and right-turn lanes would be 164 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Measure 4.6.7b (NT): The City of Fresno shall pay its fair share contribution of applicable TSMI and FMSI fees towards improvements at the Armstong and Floradora (McKinley) Avenues intersection. The improvements shall be installed and operational prior to occupancy of the relocated Water Division Corporation Yard and Administrative uses at the SE SWTF. The widening shall be designed in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

- Eastbound: one left-turn, one through lane, and one right-turn lane
- Westbound: one left-turn, one through lane, and one right-turn lane
- Northbound: one left-turn lane and two through lanes with a shared right turn
- Southbound: one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation measure the intersection would operate at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour. The 95th-percentile queues in the left-turn and right-turn lanes would be 203 feet or less.

Measure 4.6.7c (NT): Implement Mitigation Measure 4.6.5.

Measure 4.6.7d (NT): Implement Mitigation Measure 4.6.6d.

With implementation of this mitigation measure the intersection would operate at LOS C during both a.m. and p.m. peak hours. With the exception of the eastbound left-turn lane, 95th-percentile queues in the left-turn lanes would be 187 feet or less and 95th-percentile queues in right-turn lanes would be 89 feet or less. The maximum calculated 95th-

percentile queue in the eastbound left-turn lane is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the eastbound left-turn lane, which should provide a storage length of at least 319 feet.

Measure 4.6.7e (NT): Implement Mitigation Measure 4.6.6e.

Measure 4.6.7f (NT): Implement Mitigation Measure 4.6.6f.

Measure 4.6.7g (NT): Implement Mitigation Measure 4.6.6g.

Significance After Mitigation: Significant and Unavoidable

Impact 4.6.8: Construction of the proposed project, in combination with construction projects could temporarily increase traffic congestion, result in short-term traffic delays, and create traffic hazards. (Significant)

Near-Term and Future Project Elements

The geographic scope of potential cumulative traffic impacts includes access routes to area freeways, and arterial, superarterial and collector roadways used for haul routes and construction equipment/vehicle access throughout the City and its SOI. Cumulative construction activities could result in temporary increases in traffic congestion, increased potential for traffic safety hazards, and temporary and intermittent impedances to access. Proposed project construction vehicle trips would make a considerable contribution to this cumulative impact; therefore, this is considered a significant cumulative impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce the proposed project's contribution to less than considerable; therefore this cumulative impact would be less than significant by requiring that the City coordinate with the appropriate local government departments, and with utility districts and agencies regarding the timing of construction activities. In addition, project contractors would be required to obtain roadway encroachment permits and to develop and implement traffic control plans.

Measure 4.6.8 (NT/F): Implement Mitigation Measure 4.6.1.

Significance After Mitigation: Less than Significant

4.7 Air Quality and Climate Change

4.7.1 Introduction

This section provides an overview of existing air quality conditions within the proposed project area and surrounding region, regulatory framework applicable to air pollutant emissions, and an analysis of potential air quality impacts that would result from implementation of the proposed Metro Plan Update.

Comments received in response to the NOP included: a discussion of criteria pollutants (construction emissions, operational emissions, and CalEEMod as the recommended model), nuisance odors, and health impacts, discussions of the methodology, model assumptions, inputs and results used in characterizing impacts to air quality; components and phases of the project and associated emissions; project design elements and mitigation measures; and whether the project would result in a cumulatively considerable net increase of any criteria pollutant or precursor for which the San Joaquin Valley Air Basin (SJVAB) is non-attainment. Lastly, identification of which District rules the proposed project is subject to and fulfills any needed application or permit process. See Appendix B for NOP comment letters.

4.7.2 Environmental Setting

Climate and Meteorology

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions, however, are also important. Factors such as wind speed and direction, and air temperature gradients interact with physical landscape features to determine the movement and dispersal of criteria air pollutants.

The SJVAB includes the counties of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the Valley portion of Kern County. Comprising nearly 25,000 square miles, it represents approximately 16 percent of the geographic area of California. The SJVAB has a population of over 3.3 million people, with major urban centers in Bakersfield, Fresno, Modesto, and Stockton.

The SJVAB consists of a continuous inter-mountain valley approximately 250 miles long and averaging 80 miles wide. On the western edge is the Coast Mountain range, with peaks reaching 5,020 feet, and to the east of the valley is the Sierra Nevada range with some peaks exceeding 14,000 feet. The Tehachapi Mountains form the southern boundary of the valley. The region's topographic features act to restrict air movement through and out of the air basin. Airflow in the SJVAB is primarily influenced by marine air that enters through the Carquinez Strait, where the San Joaquin-Sacramento Delta empties into the San Francisco Bay. The SJVAB is highly susceptible to pollutant accumulation over time. Frequent transport of pollutants into the SJVAB from upwind sources contributes to poor air quality.

The SJVAB has an inland Mediterranean climate that is typified by warm, dry summers and cooler winters. Summer high temperatures often exceed 100ºF, averaging from the low 90s in the northern part of the valley to the high 90s in the south. The daily summer temperature variation can be as great as 30ºF. Generally, winters are mild and humid. Average high temperatures during the winter are in the 50s, while the average daily low temperature is about 45ºF. The SJVAB averages over 260 sunny days per year. Annual rainfall varies from north to south, with the northern counties receiving as much as 11 inches of rainfall and the southern counties as little as 4 inches per year. Nearly 90 percent of the annual precipitation in the SJVAB falls November through April.

Wind speed and direction play an important role in dispersion and transport of air pollutants. During summer periods airflow in the region is primarily influenced by marine air that enters through the Carquinez Strait. Winds usually originate out of the north end of the San Joaquin Valley and flow in a south-southeasterly direction through the Valley, through the Tehachapi Pass and into the neighboring Southeast Desert Air Basin. Summer transport of pollutants into the region from upwind sources sometimes contributes to ozone formation. Additionally, local emissions may impact downwind communities. Winter air quality is influenced by regional storms carrying moisture from the Pacific Ocean, with periods of calm winds between storms. During winter months, winds occasionally originate from the south end of the Valley and flow in a north-northwesterly direction. Also, during winter months, the Valley experiences light, variable winds, less than 10 mph. Low wind speeds, combined with low inversion heights, create a winter climate conducive to high concentrations of certain air pollutants (e.g., respirable particulate matter and carbon monoxide (PM_{10} and CO), respectively). Temperature inversions are formed when the vertical dispersion of air pollutants is inhibited. As a rule of thumb, air temperatures usually decrease with an increase in altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. Air above and below an inversion does not mix because of differences in air density, thereby limiting air pollutant dispersal.

Existing Conditions

The California Air Resources Board (CARB) and the SJVAPCD regional air quality monitoring network provide information on ambient concentrations of non-attainment criteria air pollutants. Air quality data is from the Fresno First Street monitoring station. Table 4.7-1 presents a three-year summary of air quality data collected at the monitoring stations for ozone and particulate matter. Table 4.7-1 also includes a comparison of monitored air pollutant concentrations with the state and national ambient air quality standards.

Criteria Air Pollutants

These pollutants are called “criteria” air pollutants because standards have been established for each of them to meet specific public health and welfare criteria set forth in the Federal Clean Air Act (CAA). California has adopted more stringent ambient air quality standards for the criteria air pollutants (referred to as State Ambient Air Quality Standards, or state standards) and has adopted air quality standards for some pollutants for which there is no corresponding national standard.

TABLE 4.7-1
AIR QUALITY DATA SUMMARY (2010–2012)

Pollutant	Standard[a]	Monitoring Data by Year 2010	2011	2012
Ozone – Fresno – 1st street				
Highest 1 Hour Average (ppm)[b]		**0.127**	**0.119**	**0.041**
Days over State Standard	0.09	16	14	0
Highest 8 Hour Average (ppm)[b]		**0.107**	**0.096**	**0.033**
Days over National Standard	0.075	26	33	0
Days over State Standard	0.070	51	54	0
Particulate Matter (PM_{10}) – Fresno – 1st street				
Highest 24 Hour Average ($\mu g/m^3$)[b]		**85.6**	**99.5**	**NA**
Est. Days over State Standard[c]	**50**	31	**54**	NA
Highest 24 Hour Average ($\mu g/m^3$)[b] – National Measurement		88.6	94.3	NA
Est. Days over National Standard[c]	**150**	0	0	NA
State Annual Average ($\mu g/m^3$)[b]	**20**	**25.9**	**29.6**	NA
Particulate Matter (PM_{10}) – Fresno – Drummond street				
Highest 24 Hour Average ($\mu g/m^3$)[b]		**66.5**	**91.3**	**114.3**
Est. Days over State Standard[c]	**50**	NA	**72**	NA
Highest 24 Hour Average ($\mu g/m^3$)[b] – National Measurement		68.1	86.1	114
Est. Days over National Standard[c]	**150**	NA	0	NA
State Annual Average ($\mu g/m^3$)[b]	**20**	**NA**	**32.3**	NA
Particulate Matter ($PM_{2.5}$) – Modesto-14th Street				
Highest 24 Hour Average ($\mu g/m^3$)[b]		**58.3**	**77.3**	**93.4**
Est. Days over National Standard[c]	**35**	21.7	**39**	NA
State Annual Average ($\mu g/m^3$)[b]	**12**	**16.5**	**15.9**	**NA**

a Generally, state standards and national standards are not to be exceeded more than once per year.
b ppm = parts per million; µg/m3 = micrograms per cubic meter.
c PM_{10} and $PM_{2.5}$ are not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.
Values in **bold** are in excess of at least one applicable standard. NA = Not Available.
SOURCE: California Air Resources Board, 2013. *Summaries of Air Quality Data*, 20010 through 2012; http://www.arb.ca.gov/adam

Ozone. Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional

subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide. Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence carbon monoxide concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area that may extend some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

CO concentrations have declined dramatically in California due to existing controls and programs and most areas of the state including the project region have no problem meeting the carbon monoxide state and federal standards. CO measurements and modeling were important in the early 1980's when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, lower emissions from new vehicles and improvements in fuels. The clear success in reducing CO levels is evident in the first paragraph of the executive summary of the California Air Resources Board *2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas*, shown below:

> "The dramatic reduction in carbon monoxide (CO) levels across California is one of the biggest success stories in air pollution control. Air Resources Board (CARB or Board) requirements for cleaner vehicles, equipment and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the State designated as non-attainment for the federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican border had no violations of the federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard."

Respirable Particulate Matter (PM_{10} and $PM_{2.5}$). PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. (A micron is one-millionth of a meter). PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and state ambient air quality

standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus, are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing.

Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health. The CARB has estimated that achieving the ambient air quality standards for PM_{10} could reduce premature mortality rates by 6,500 cases per year.

Nitrogen Dioxide (NO_2). NO_2 is a reddish brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, nitrogen dioxide can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

Sulfur Dioxide (SO_2). SO_2 is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate, particulate matter and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. The maximum SO_2 concentrations recorded in the project area are well below federal and state standards.

Lead. Ambient lead concentrations meet both the federal and state standards in the project area. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline products. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. The proposed project would not introduce any new sources of lead emissions; consequently, lead emissions are not required to be quantified and are not further evaluated in this analysis.

Non-Criteria Air Pollutants

Toxic Air Contaminants

Non-criteria air pollutants or toxic air contaminants (TAC) are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Odorous Emissions

Though offensive odors from stationary sources rarely cause any physical harm, they still remain unpleasant and can lead to public distress generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency and intensity of the source; wind speed and direction; and the sensitivity of receptors. Generally, increasing the distance between the receptor and the source will mitigate odor impacts.

Greenhouse Gases

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere, similar to a greenhouse. The accumulation of GHGs has been implicated as a driving force for Global Climate Change. Definitions of climate change vary between and across regulatory authorities and the scientific community, but in general can be described as the changing of the earth's climate caused by natural fluctuations and the impact of human activities that alter the composition of the global atmosphere. Global Climate Change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation and temperature. Although there is disagreement as to the speed of global warming and the extent of the impacts attributable to human activities, the vast majority of the scientific community now agrees that there is a direct link between increased emission of GHGs and long term global temperature. Potential global warming impacts in California may include, but are not limited to, loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. Both natural processes and human activities emit GHGs.

GHGs include but are not limited to carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (California Health and Safety Code section 38505(g)). CO_2 is the reference gas for climate change because it gets the most attention and is considered the most important greenhouse gas. To account for the warming potential of different GHGs, GHG emissions are quantified and reported as CO_2 equivalents (CO_2e). The effects of GHG emission sources (i.e., individual projects) are reported in metric tons/year of CO_2e.

Sensitive Receptors

Land uses such as schools, hospitals, and convalescent homes are considered to be sensitive to poor air quality conditions because infants, children, the elderly, and people with health afflictions (especially respiratory ailments) are more susceptible to respiratory infections and other air-quality-related health problems than the general public. Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Sensitive land uses are located throughout the project area and along proposed pipeline and conveyance facility alignments including numerous residences, schools, and hospitals.

Sensitive receptors in the vicinity of the existing NE SWTF facilities are located approximately 300 to 350 feet west of single-family residences and a childcare facility across East Behymer Avenue. Riverview Elementary School is located approximately 500 feet south of existing NE

SWTF facilities. Granite Ridge Intermediate and Clovis North High School are located approximately 1,500 feet north of existing NE SWTF facilities.

The nearest sensitive receptors to the proposed SE SWTF site are eight single family residences and Temperance-Kutner Elementary School, all located between 75 feet and 100 feet from the site boundary.

4.7.3 Regulatory Setting

Regulation of air pollution is achieved through both national and state ambient air quality standards and through emissions limits on individual sources of air pollutants. Local air quality management districts (AQMDs) and air pollution control districts (APCDs) are responsible for demonstrating attainment with state air quality standards through the adoption and enforcement of Attainment Plans.

Federal

The CAA requires the EPA to identify National Ambient Air Quality Standards (NAAQS) (national standards) to protect public health and welfare. National standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, respirable particulate matter (PM_{10} and $PM_{2.5}$), and lead. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria set forth in the CAA. California has adopted more stringent ambient air quality standards for the criteria air pollutants (referred to as State Ambient Air Quality Standards, or state standards) and has adopted air quality standards for some pollutants for which there is no corresponding national standard. Table 4.7-2 presents current national and state ambient air quality standards and provides a brief discussion of the related health effects and principal sources for each pollutant.

Pursuant to the 1990 Federal Clean Air Act Amendments (CAAA), the EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the NAAQS had been achieved. Table 4.7-3 shows the current attainment status of the project area.

The CAA required each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The CAAA added requirements for states containing areas that violate the NAAQS to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The EPA has responsibility to review all state SIPs to determine if they conform to the mandates of the CAAA and will achieve air quality goals when implemented. If the EPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the nonattainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated timeframes can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

TABLE 4.7-2
STATE AND NATIONAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour 8 hours	0.09 ppm 0.070 ppm	--- 0.075 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases (ROG) and nitrogen oxides (NO_x) react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide	1 hour 8 hours	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide	1 hour Annual Avg.	0.18 ppm 0.030 ppm	100 ppb 53 ppb	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide	1 hour 3 hours 24 hours	0.25 ppm --- 0.04 ppm	75 ppb 0.5 ppm ---	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM_{10})	24 hours Annual Avg.	50 $\mu g/m^3$ 20 $\mu g/m^3$	150 $\mu g/m^3$ ---	May irritate eyes and respiratory tract, decreases in lung capacity, can cause cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Fine Particulate Matter ($PM_{2.5}$)	24 hours Annual Avg.	--- 12 $\mu g/m^3$	35 $\mu g/m^3$ 15.0 $\mu g/m^3$	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_x, sulfur oxides, and organics.
Lead	Monthly Ave. Quarterly	1.5 $\mu g/m^3$ ---	--- 1.5 $\mu g/m^3$	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations)	Geothermal power plants, petroleum production and refining.
Sulfates	24 hour	25 $\mu g/m^3$	No National Standard	Breathing difficulties, aggravates asthma, reduced visibility	Produced by the reaction in the air of SO_2.
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	No National Standard	Reduces visibility, reduced airport safety, lower real estate value, discourages tourism.	See $PM_{2.5}$.

ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.

SOURCES: California Air Resources Board (CARB), 2010a. *Ambient Air Quality Standards,* available at http://www.arb.ca.gov/research/aaqs/aaqs2.pdf Standards last updated September 8, 2010; and ARB, 2009. *ARB Fact Sheet: Air Pollution Sources, Effects and Control,* http://www.arb.ca.gov/research/health/fs/fs2/fs2.htm, page last updated December 2009.

Regulation of TACs, termed Hazardous Air Pollutants (HAPs) under federal regulations, is achieved through federal, State and local controls on individual sources. The 1977 Clean Air Act Amendments required the USEPA to identify National Emission Standards for Hazardous Air Pollutants (NESHAPs) to protect public health and welfare. These substances include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. There is uncertainty in the precise degree of hazard

TABLE 4.7-3
SAN JOAQUIN VALLEY ATTAINMENT STATUS

	Designation/Classification	
Pollutant	**Federal Standards**	**State Standards**
Ozone – one hour	No Federal Standard[1]	Nonattainment/Severe
Ozone – eight hour	Nonattainment/Extreme[2]	Nonattainment
PM_{10}	Attainment[3]	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead	No Designation / Classification	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Vinyl Chloride	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified

1 Federal One Hour Ozone National Ambient Air Quality Standard was revoked on June 15, 2005
2 Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).
3 On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM_{10} National Ambient Air Quality Standard (NNQS) and approved the PM_{10} Maintenance Plan.\

SOURCE: SJVAPCD, 2009b,*Ambient Air Quality Standards and Valley Attainment Status*, available at http://www.valleyair.org/aqinfo/attainment.htm

State

The CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county APCDs and regional AQMDs. CARB establishes state ambient air quality standards and vehicle emissions standards.

California has adopted ambient standards that are more stringent than the federal standards for the criteria air pollutants. These are shown in Table 4.7-2. Under the California Clean Air Act (CCAA) patterned after the CAA, areas have been designated as attainment or nonattainment with respect to the state standards. Table 4.7-3 summarizes the attainment status with California standards in the project vicinity.

Toxic Air Contaminants

California State law defines TACs as air pollutants having carcinogenic effects. The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). A total of 243 substances have been designated TACs under California law; they include the 189 (federal) HAPs adopted in accordance with AB 2728. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. Toxic air contaminant emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment and, if specific thresholds are violated, are required to communicate the results to the public in the form of notices and public meetings.

In August of 1998, CARB identified particulate emissions from diesel-fueled engines (diesel particulate matter, or DPM) as TACs. CARB subsequently developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. The document represents proposals to reduce diesel particulate emissions, with the goal of reducing emissions and associated health risks by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra low sulfur diesel fuel on diesel-fueled engines.

CARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* in 2005 (CARB, 2005). The primary goal in developing the handbook was to provide information that will help keep California's children and other vulnerable populations out of harm's way with respect to nearby sources of air pollution. The handbook highlights recent studies that have shown that public exposure to air pollution can be substantially elevated near freeways and certain other facilities (i.e., distribution centers, rail yards, chrome platers, etc.). However, the health risk is greatly reduced with distance. For that reason, CARB provided some general recommendations aimed at keeping appropriate distances between sources of air pollution and sensitive land uses, such as residences.

California Environmental Quality Act and Climate Change

CEQA requires lead agencies to consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. In turn, global climate change has the potential to: raise sea levels, affect rainfall and snowfall, and affect habitat.

As revised pursuant to Senate Bill 97 adopted in 2007 (Cal PRC Section 21083.05), the State CEQA Guidelines, effective in mid-2010, require lead agencies to describe, calculate, or estimate the amount of GHG emissions that would result from a project. Moreover, the State CEQA Guidelines emphasize the necessity to determine potential climate change effects of the project and propose mitigation as necessary. The State CEQA Guidelines confirm the discretion of lead agencies to determine appropriate significance thresholds, but require the preparation of an EIR if "there is substantial evidence that the possible effects of a particular project are still cumulatively

considerable notwithstanding compliance with adopted regulations or requirements" (section 15064.4). State CEQA Guidelines section 15126.4 includes considerations for lead agencies related to feasible mitigation measures to reduce GHG emissions, which may include, among others, measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision; implementation of project features, project design, or other measures which are incorporated into the project to substantially reduce energy consumption or GHG emissions; offsite measures, including offsets that are not otherwise required, to mitigate a project's emissions; and, measures that sequester carbon or carbon-equivalent emissions.

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed AB 1493, which required Air Resources Board (ARB) to develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, the ARB approved amendments to the California CCR in 2004, adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1), require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight [GVW] rating of less than 10,000 pounds and which is designed primarily for the transportation of persons), beginning with model year 2009. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for model year 2016 are approximately 37 percent lower than the limits for the first year of the regulations, model year 2009. For light-duty trucks with an LVW of 3,751 pounds to a GVW of 8,500 pounds, as well as for medium-duty passenger vehicles, GHG emissions will be reduced approximately 24 percent between 2009 and 2016.

Because the Pavley standards (named for the bill's author, state Senator Fran Pavley) would impose stricter standards than those under the CAA, California applied to the EPA for a waiver under the CAA; this waiver was denied in 2008. In 2009, however, the EPA granted the waiver.

Executive Order S-3-05

In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide GHG emissions would be progressively reduced: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 32 and the California Climate Change Scoping Plan

In 2006, the California legislature passed AB 32 (California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), also known as the Global Warming Solutions Act. AB

32 requires the ARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions).

Pursuant to AB 32, the ARB adopted a Climate Change Scoping Plan in December 2008 (CARB, 2008), which was re-approved by ARB on August 24, 2011, outlining measures to meet the 2020 GHG reduction limits. In order to meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business as usual emissions levels, or about 15 percent from today's levels. The Scoping Plan estimates a reduction of 174 million metric tons of CO_2e (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and other sources, with measures summarized in Table 4.7-4 below. The ARB has identified an implementation timeline for the GHG reduction strategies in the Scoping Plan. Some measures may require new legislation to implement, some will require subsidies, some have already been developed, and some will require additional effort to evaluate and quantify. Additionally, some emissions reductions strategies may require their own environmental review under CEQA or the National Environmental Policy Act (NEPA).

TABLE 4.7-4
LIST OF RECOMMENDED ACTIONS BY SECTOR

Measure No.	Measure Description	GHG Reductions (Annual Million Metric Tons CO_2e)
Transportation		
T-1	Pavley I and II – Light Duty Vehicle Greenhouse Gas Standards	31.7
T-2	Low Carbon Fuel Standard (Discrete Early Action)	15
T-3[1]	Regional Transportation-Related Greenhouse Gas Targets	5
T-4	Vehicle Efficiency Measures	4.5
T-5	Ship Electrification at Ports (Discrete Early Action)	0.2
T-6	Goods Movement Efficiency Measures. • Ship Electrification at Ports • System-Wide Efficiency Improvements	3.5
T-7	Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Measure – Aerodynamic Efficiency (Discrete Early Action)	0.93
T-8	Medium- and Heavy-Duty Vehicle Hybridization	0.5
T-9	High Speed Rail	1
Electricity and Natural Gas		
E-1	Energy Efficiency (32,000 GWh of Reduced Demand) • Increased Utility Energy Efficiency Programs • More Stringent Building & Appliance Standards Additional Efficiency and Conservation Programs	15.2
E-2	Increase Combined Heat and Power Use by 30,000 GWh (Net reductions include avoided transmission line loss)	6.7
E-3	Renewables Portfolio Standard (33% by 2020)	21.3
E-4	Million Solar Roofs (including California Solar Initiative, New Solar Homes Partnership and solar programs of publicly owned utilities) • Target of 3000 MW Total Installation by 2020	2.1

TABLE 4.7-4
LIST OF RECOMMENDED ACTIONS BY SECTOR

Measure No.	Measure Description	GHG Reductions (Annual Million Metric Tons CO_2e)
CR-1	Energy Efficiency (800 Million Therms Reduced Consumptions) • Utility Energy Efficiency Programs • Building and Appliance Standards • Additional Efficiency and Conservation Programs	4.3
CR-2	Solar Water Heating (AB 1470 goal)	0.1
Green Buildings		
GB-1	Green Buildings	26
Water		
W-1	Water Use Efficiency	1.4†
W-2	Water Recycling	0.3†
W-3	Water System Energy Efficiency	2.0†
W-4	Reuse Urban Runoff	0.2†
W-5	Increase Renewable Energy Production	0.9†
W-6	Public Goods Charge (Water)	TBD†
Industry		
I-1	Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	TBD
I-2	Oil and Gas Extraction GHG Emission Reduction	0.2
I-3	GHG Leak Reduction from Oil and Gas Transmission	0.9
I-4	Refinery Flare Recovery Process Improvements	0.3
I-5	Removal of Methane Exemption from Existing Refinery Regulations	0.01
Recycling and Water Management		
RW-1	Landfill Methane Control (Discrete Early Action)	1
RW-2	Additional Reductions in Landfill Methane • Increase the Efficiency of Landfill Methane Capture	TBD†
RW-3	High Recycling/Zero Waste • Commercial Recycling • Increase Production and Markets for Compost • Anaerobic Digestion • Extended Producer Responsibility • Environmentally Preferable Purchasing	9†
Forests		
F-1	Sustainable Forest Target	5
High Global Warming Potential (GWP) Gases		
H-1	Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Services (Discrete Early Action)	0.26
H-2	SF_6 Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)	0.3
H-3	Reduction of Perfuorocarbons in Semiconductor Manufacturing (Discrete Early Action)	0.15
H-4	Limit High GWP Use in Consumer Products Discrete Early Action (Adopted June 2008)	0.25
H-5	High GWP Reductions from Mobile Sources • Low GWP Refrigerants for New Motor Vehicle Air Conditioning Systems • Air Conditioner Refrigerant Leak Test During Vehicle Smog Check	3.3

TABLE 4.7-4
LIST OF RECOMMENDED ACTIONS BY SECTOR

Measure No.	Measure Description	GHG Reductions (Annual Million Metric Tons CO_2e)
	• Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers • Enforcement of Federal Ban on Refrigerant Release during Servicing or Dismantling of Motor Vehicle Air Conditioning Systems	
H-6	High GWP Reductions from Stationary Sources • High GWP Stationary Equipment Refrigerant Management Program: - Refrigerant Tracking/Reporting/Repair Deposit Program - Specifications for Commercial and Industrial Refrigeration Systems • Foam Recovery and Destruction Program • SF Leak Reduction and Recycling in Electrical Applications • Alternative Suppressants in Fire Protection Systems • Residential Refrigeration Early Retirement Program	10.9
H-7	Mitigation Fee on High GWP Gases	5
Agriculture		
A-1	Methane Capture at Large Dairies	1.0†

[1] This is not the SB 375 regional target. ARB will establish regional targets for each Metropolitan Planning Organization (MPO) region following the input of the regional targets advisory committee and a consultation process with MPO's and other stakeholders per SB 375.
† GHG emission reduction estimates are not included in calculating the total reductions needed to meet the 2020 target.

AB 32 also anticipates that local government actions will result in reduced GHG emissions. ARB has identified a GHG reduction target of 15 percent from current levels for local governments themselves and notes that successful implementation of the plan relies on local governments' land use planning and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions.

The Scoping Plan relies on the requirements of Senate Bill 375 (discussed below) to implement the carbon emission reductions anticipated from land use decisions. SB 375 was enacted to align local land use and transportation planning to further achieve the state's GHG reduction goals. SB 375 requires regional transportation plans (RTPs), developed by Metropolitan Planning Organizations (MPOs), to incorporate a "sustainable communities strategy" that would achieve GHG emission reduction targets set by the ARB. SB 375 also includes provisions for streamlined CEQA review for some infill projects, such as transit-oriented development. SB 375 would be implemented over the next several years. The Metropolitan Transportation Commission (MTC) is responsible for developing RTPs for the Bay Area. MTC's 2013 RTP will be its first plan subject to SB 375.

Executive Order S-1-07

Executive Order S-1-07, signed by then-Governor Schwarzenegger in 2007, proclaimed that the transportation sector is the main source of GHG emissions in California, at over 40 percent of statewide emissions. The order established a goal of reducing the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020. It also directed the

ARB to determine whether this Low Carbon Fuel Standard could be adopted as a discrete, early-action measure after meeting the mandates in AB 32. The ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

Senate Bill 1078 and 107 and Executive Order S-14-08 and S-21-09

Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs the ARB under its AB 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33 percent renewable energy by 2020. The 33 percent by 2020 goal was codified in April 2011 with SB X1-2, which was signed by Governor Edmund G. Brown, Jr. This new RPS preempts the ARB 33 percent Renewable Electricity Standard and applies to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must adopt the new Renewable Portfolio Standard (RPS) goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirement being met by the end of 2020.

Senate Bill 1368

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) was also required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

Senate Bill 97

SB 97, signed in August 2007, acknowledges that climate change is a prominent environmental issue requiring analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Natural Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, no later than July 1, 2009 (OPR, 2008). The California Natural Resources Agency was required to certify or adopt those guidelines by January 1, 2010. On December 30, 2009, the Natural Resources Agency adopted the state CEQA Guidelines amendments, as required by SB 97. These state CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments were reviewed by the Office of Administrative Law and became effective March 18, 2010.

Senate Bill 375

In addition to policy directly guided by AB 32, the legislature in 2008 passed SB 375, which provides for regional coordination in land use and transportation planning and funding to help meet the AB 32 GHG reduction goals. SB 375 aligns regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires RTPs developed by the state's 18 MPOs to incorporate a "sustainable communities strategy" (SCS) that will achieve GHG emission reduction targets set by the ARB.

Local

San Joaquin Valley Air Pollution Control District

The SJVAPCD is the primary local agency responsible for protecting human health and property from the harmful effects of air pollution in the SJVAB, and has jurisdiction over most stationary source air quality matters in the SJVAB. The SJVAPCD includes all of Merced, San Joaquin, Stanislaus, Madera, Fresno, Kings and Tulare counties, and the valley portion of Kern County.

The SJVAPCD is responsible for developing attainment plans for the SJVAB, for inclusion in California's SIP, as well as establishing and enforcing air pollution control rules and regulations. The attainment plans must demonstrate compliance with federal and state ambient air quality standards, and must first be approved by CARB before inclusion into the SIP. The SJVAPCD regulates, permits, and inspects stationary sources of air pollution. Among these sources are industrial facilities, gasoline stations, auto body shops, municipal solid waste landfills and dry cleaners to name a few. While the state is responsible for emission standards and controlling actual tailpipe emissions from motor vehicles, the SJVAPCD is required to regulate emissions associated with stationary sources such as agricultural burning and industrial operations. The SJVAPCD also works with eight local transportation planning agencies (including the Fresno Council of Governments) to implement transportation control measures, and to recommend mitigation measures for new growth and development designed to reduce the number of cars on the road. The SJVAPCD promotes the use of cleaner fuels, and funds a number of public and private agency projects that provide innovative approaches to reducing air pollution from motor vehicles.

Federal and state air quality laws also require regions designated as nonattainment to prepare plans that either demonstrates how the region will attain the standard or that demonstrate reasonable improvement in air quality conditions. As noted, the SJVAPCD is responsible for developing attainment plans for the SJVAB, for inclusion into California's SIP.

The SJVAPCD's primary means of implementing the above air quality plans is by adopting and enforcing rules and regulations. Stationary sources within the jurisdiction are regulated by the District's permit authority over such sources, such as Rule 2010 (Permits Required) and Rule 2201 (New and Modified Stationary Source Review Rule), and through its review and planning activities. Additional District Rules that may apply to the project include:

- District Rule 2280 (Portable Equipment Registration). All portable emission units (including portable drilling rigs) are required to register with the District or the CARB. Should this

project require the installation of an air stripping operation, and/or an auxiliary diesel or natural gas engine greater than fifty brake horsepower, application for an Authority to Construct may be required.

- District Rule 3135 (Dust Control Plan Fee). This rule requires the applicant to submit a fee in addition to a Dust Control Plan. The purpose of this fee is to recover the District's cost for reviewing these plans and conducting compliance inspections.

- District Rule 4102 (Nuisance). This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and be subject to District enforcement action.

- District Rule 4103 (Open Burning). This rule regulates the use of open burning and specifies the types of materials that may be burned. Agricultural material shall not be burned when the land use is converting from agriculture to non-agricultural purposes (e.g., commercial, industrial, institutional, or residential uses). Section 5.1 of this rule prohibits the burning of trees and other vegetative (non-agricultural) material whenever the land is being developed for non-agricultural purposes. In the event that the project applicant burned or burns agricultural material, it would be in violation of Rule 4103 and be subject to District enforcement action.

- District Regulation VIII (Fugitive PM_{10} Prohibitions). Regulation VIII (Rules 8011-8081) is a series of rules designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction, road construction, bulk materials storage, landfill operations, etc. The Dust Control Plan threshold has changed from 40.0 acres to 5.0 or more acres for non-residential sites. If a non-residential site is 1.0 to less than 5.0 acres, an owner/operator must provide written notification to the District at least 48 hours prior to his/her intent to begin any earthmoving activities. If a residential site is 1.0 to less than 10.0 acres, an owner/operator must provide written notification to the District at least 48 hours prior to his/her intent to begin any earthmoving activities.

  Regulation VIII specifically addresses the following activities:

  - Rule 8011: General Requirements;
  - Rule 8021: Construction, Demolition, Excavation, Extraction and other Earthmoving Activities;
  - Rule 8031: Bulk Materials;
  - Rule 8041: Carryout and Trackout;
  - Rule 8051: Open Areas;
  - Rule 8061: Paved and Unpaved Roads; and
  - Rule 8071: Unpaved Vehicle/Equipment Traffic Areas.

- District Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). Paving operations on this project will be subject to Rule 4841. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt, and emulsified asphalt for paving and maintenance operations.

Also, in addition to these above-described rules, District Rule 9510 Indirect Source Review (ISR) was adopted December 15, 2005. ISR was adopted to fulfill the District's emission reduction commitments in the PM_{10} and Ozone Attainment Plans. ISR requires submittal of an Air Impact Assessment (AIA) application no later than applying for a final discretionary approval with the

public agency. The AIA will be the information necessary to calculate both construction and operational emissions of a development project. Construction of the project would qualify as development projects under Rule 9510. Section 6.0 of the Rule outlines general mitigation requirements for developments that include reduction in construction emissions of 20% of the total construction NO_x emissions, and 45% of the total construction PM_{10} exhaust emissions. Section 6.0 of the Rule also requires the project to reduce operational NO_x emissions by 33.3% and operational PM_{10} emissions by 50%. Section 7.0 of the Rule includes fee schedules for construction or operational excess emissions of NO_x or PM_{10}; those emissions above the goals identified in Section 6.0 of the Rule. Section 7.2 of the Rule identifies fees for excess emissions.

The SJVAPCD also limits emissions of, and public exposure to, toxic air contaminants through a number of programs. District Policies 1905 (Risk Management Policy for Permitting New and Modified Sources) and 1910 (Toxic Best Available Control Technology for New and Modified Diesel Internal Combustion Engines) provide guidelines on permitting sources that emit toxic air contaminants (also referred to interchangeably by the district as hazardous air pollutants).

The potential for new and modified stationary sources to emit toxic air contaminants is reviewed by the SJVAPCD's Permit Services Division, which implements the SJVAPCD's Risk Management Policy. The District's Regulation VII pertains specifically to toxic air contaminants. Toxic air contaminant emissions from stationary sources are limited by:

- SJVAPCD adoption and enforcement of rules aimed at specific types of sources known to emit toxic air contaminants;
- Implementation of the Air Toxics "Hot Spots" Program; and
- Implementation of the Federal Title III Toxics program.

Several Air districts, including the SJVAPCD have adopted published guidance on how to analyze GHG emissions. SJVAPCD published the Final Staff Report: Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act in 2009 (SJVAPCD, 2009a) to streamline the process of determining if project specific GHG emissions would have a significant effect.

City of Fresno General Plan

The Mitigated Negative Declaration (MND) prepared for the update to the 2025 Fresno General Plan Air Quality Element was approved in June 2009. The update was done to comply with applicable state law that required the Air Quality discussion in the general plan to be updated. The following objectives are pertinent to the proposed Metro Plan Update.

Air Quality Objective G-1B-c.(1) The City shall initiate a process to revise land use policies, ordinances, development standards and landscape/shading standards to incorporate appropriate water conservation, water recycling, and recharge measures into private and public project analysis and design (e.g. requiring installation of dual color-identified plumbing that would accommodate future use of recycled water for landscaping).

4.7.4 Impacts and Mitigation Measures

Methods of Analysis

Construction Impacts

Daily construction emissions were forecast for each project component by using of the by using default and custom (when available) values from the air quality emissions model CalEEMod version 2013.2.2. CalEEMod output sheets are provided in Appendix F of this document.

Operational Impacts

EMFAC 2007 was used to estimate the operational emissions of the proposed project; data is provided in the Appendix F of this document.

Greenhouse Gases and Climate Change

GHG emissions relate to an inherently a cumulative impact because no single project makes a significant contribution to global climate change. The State CEQA Guidelines require the analysis of GHGs and potential climate change impacts from new development. Under section 15183.5 of the State CEQA Guidelines,

> [p]ublic agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.

As described above, the 2009 Mitigated Negative Declaration (MND) prepared for the update to the 2025 Fresno General Plan Air Quality Element addressed changes in the objectives and policies of the 2025 Fresno General Plan as a result of new legislation, specifically California AB 170 and AB 32. New and revised mitigation measures were applied to the 2025 Fresno General Plan and Master EIR in the form of policies to change the nature of the project in ways that would reduce and mitigate impacts consistent with the direction given by AB 170 and AB 32. Further, the 2025 Fresno General Plan Master EIR mitigation measure checklist was augmented to further the goals, objectives, and policies for air quality improvement, and to assure that implementing air quality improvement policies will not cause other significant adverse cumulative impacts. It was found that any potential impacts related to air quality resulting from this new legislation, was adequately mitigated in the Master EIR and Air Quality MND to less than significant levels. To determine the direct impact of the project with respect to climate change and GHG's, specifically construction activities, four types of analyses are used to determine whether the project could conflict with the State goals for reducing GHG emissions. The analyses are as follows:

a. Any potential conflicts with the CARB's thirty-nine (39) recommended actions in California's AB 32 Climate Change Scoping Plan.

b. The relative size of the project. The project's greenhouse gas emissions will be compared to the size of major facilities that are required to report greenhouse gas emissions (25,000 metric tons/year of CO_2e)[1] to the State; and the project size will also be compared to the California GHG emissions limit of 427 million metric tons per year of CO_2e emissions by 2020. The 25,000 metric ton annual limit identifies the large stationary point sources in California that make up approximately 94 percent of the stationary emissions. If the project's total emissions are below this limit, its total emissions are equivalent in size to the smaller projects in California that as a group only make up 6 percent of all stationary emissions. It is assumed that the activities of these smaller projects generally would not conflict with State's ability to reach AB 32 overall goals. In reaching its goals the CARB will focus upon the largest emitters of GHG emissions.

c. The basic energy efficiency parameters of a project to determine whether its design is inherently energy efficient.

d. Any potential conflicts with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any nonattainment pollutant (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people;
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHG (including AB 32, the California Global Warming Solutions Act of 2006, and the AB 32 Scoping Plan).

Criteria Pollutants

For construction impacts, the pollutant of greatest concern to the District is PM_{10}.[2] The SJVAPCD recommends that significance be based on a consideration of the control measures to be implemented during project construction (SJVAPCD, 2002). Compliance with Regulation VIII, Rule 8011, and implementation of appropriate mitigation measures to control respirable particulate matter (PM_{10}) emissions are considered by the SJVAPCD to be sufficient to render a project's construction-related

[1] The State of California has not provided guidance as to quantitative significance thresholds for assessing the impact of greenhouse gas emissions on climate change and global warming concerns. Nothing in the CEQA Guidelines directly addresses this issue.

2 Construction equipment emits carbon monoxide and ozone precursors. The SJVAPCD has determined that these emissions would cause a significant air quality impact only in the case of a very large or very intense construction project (SJVAPCD, 2002).

impacts less-than-significant for most projects. The SJVAPCD *Guide for Assessing and Mitigating Air Quality Impacts* (*GAMAQI*) contains a list of feasible control measures for construction-related PM_{10} emissions.

The SJVAPCD's *GAMAQI* also includes significance criteria for evaluating operational-phase emissions from direct and indirect sources associated with a project. Indirect sources include motor vehicle traffic resulting from the project and do not include stationary sources covered under permit with the SJVAPCD. For this analysis, the project would be considered to have a significant effect on the environment if it would exceed the following thresholds:

- Cause a net increase in pollutant emissions of ROG or NO_x exceeding 10 tons per year
- Cause a violation of state CO concentration standards. The level of significance of CO emissions from mobiles sources is determined by modeling the ambient concentration under project conditions and comparing the resultant 1- and 8-hour concentrations to the respective state CO standards of 20.0 and 9.0 parts per million.
- Cause "visible dust emissions" due to onsite operations and thereby violate SJVAPCD Regulation VIII.[3]

Although the SJVAPCD *GAMAQI* recognizes that PM_{10} is a major air quality issue in the basin, it does not establish quantitative thresholds for potential impact significance. However, for the purposes of this analysis, a PM_{10} emission of 15 tons per year from project operations is used as a significance threshold. Therefore, 15 tons per year is the SJVAPCD threshold level at which new stationary sources requiring SJVAPCD permits must provide emissions "offsets". This threshold of significance for PM_{10} is consistent with the establishment of the ROG and NO_x thresholds of 10 tons per year, which are also offset thresholds established in SJVAPCD Rule 2201.

- Stationary sources that comply, or that would comply, with SJVAPCD Rules and Regulations are generally not considered to have a significant air quality impact.

Toxic Air Contaminants

The operation of any project with the potential to expose sensitive receptors to substantial levels of TACs would be deemed to have a potentially significant impact. More specifically, proposed development projects that have the potential to expose the public to TACs in excess of the following thresholds would be considered to have a significant air quality impact:

- Probability of contracting cancer for the Maximally Exposed Individual[4] (MEI) exceeds 10 in one million.
- Ground-level concentrations of non-carcinogenic TACs would result in a Hazard Index greater than 1 for the MEI.

These standards are typically applied to the results of a health risk assessment based on a detailed air dispersion modeling effort.

3 Visible dust is defined by the SJVAPCD as "visible dust of such opacity as to obscure an observer's view to a degree equal to or greater than a capacity of 40 percent, for a period or periods aggregating more than three minutes in any one hour."

4 MEI represents the worst-case risk estimate based on a theoretical person continuously exposed for 70 years at the point of highest compound concentration in air.

Impacts and Mitigation Measures

Table 4.7-5 provides a summary of the impact analysis for issues related to geology and soils.

TABLE 4.7-5
PROPOSED PROJECT IMPACT SUMMARY – AIR QUALITY AND CLIMATE CHAGE

	Near-Term Project Elements		Future Project Elements	
Impact	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.7.1: Construction activities associated with development of the project would generate short-term emissions of criteria pollutants.	S	SU	S	SU
Impact 4.7.2: Operation of the project could generate criteria air pollutant emissions that could contribute to existing nonattainment conditions and degrade air quality.	LS	NA	LS	NA
Impact 4.7.3: Construction and/or operation of the project could expose sensitive receptors to substantial pollutant concentrations.	LS	NA	LS	NA
Impact 4.7.4: The project could create objectionable odors affecting a substantial number of people.	LS	NA	LS	NA
Impact 4.7.5: Construction and operation of the project could result in a cumulatively considerable increase in greenhouse gas emissions.	LS	NA	LS	NA
Impact 4.7.6: Construction of proposed project facilities, when combined other development projects in the San Joaquin Valley air basin, would result in cumulative air quality impacts.	S	SU	S	SU
Impact 4.7.7: Operation of proposed project facilities, when combined other development projects in the San Joaquin Valley air basin, would result in cumulative air quality impacts.	LS	NA	LS	NA

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less than Significant Impact
NA = Not Applicable

Impact 4.7.1: Construction activities associated with development of the project would generate short-term emissions of criteria pollutants. (Significant)

Near-term and Future Project Elements

Construction of pipelines and conveyance facilities would involve excavation and trenching. Construction of other project facilities would include site preparation and clearing, excavation, paving, and construction. Proposed project construction activities would produce criteria pollutant emissions (primarily ROG and NO_x) as a result of using heavy-duty construction equipment. Mobile source emission would also be produced from construction worker vehicle trips to and from the project site. In addition, fugitive dust emissions would be generated from site preparation and excavation activities and vehicle travel on paved and unpaved surfaces.

Construction equipment exhaust also would include some PM_{10} emissions. PM_{10} and $PM_{2.5}$ emissions from construction would vary greatly from day to day depending on the level of activity, the equipment being operated, silt content of the soil, and the prevailing weather. Larger-diameter dust particles (i.e., greater than 30 microns) generally fall out of the atmosphere within several hundred feet of construction sites, and represent more of a soiling nuisance than a health hazard. Smaller-diameter particles (e.g., PM_{10} and $PM_{2.5}$) are associated with adverse health effects and generally remain airborne until removed from the atmosphere by moisture. Therefore, unmitigated construction dust emissions could result in significant local effects.

Criteria pollutant emissions of ROG and NO_x from construction equipment and construction worker vehicle trips would incrementally add to regional atmospheric loading of ozone precursors during the construction period.

As described above, Daily construction emissions were forecast for each project component by using of the by using default and custom (when available) values from the air quality emissions model CalEEMod version 2013.2.2. CalEEMod output sheets are provided in Appendix F of this document. The results of the analysis are summarized in Table 4.7-6.

As depicted in Table 4.7-6, the estimated emissions from construction during the worst-case year would result in significant ROG and NO_x emissions.

Due to uncertainty about when and where the future project elements, including the new SW SWTF, regional transmission facilities, water storage facilities, and groundwater facilities may be constructed, air quality impacts are not quantified in the same manner as with the near-term project elements. However, the nature of the construction impacts would be similar, and would result in increased emissions above those calculated for the near-term project elements. This is considered a significant impact. As implementation of the proposed project is conducted, site specific construction impacts would be evaluated to determine if thresholds of significance would be exceeded.

TABLE 4.7-6
UNMITIGATED EMISSIONS FROM NEAR-TERM CONSTRUCTION
(TONS PER YEAR)[a,b]

Project Component	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$	CO_2
SE SWTF Improvements						
With Conveyance Option 1	18	15	18	1	1	2,504
With Conveyance Option 2	18	11	18	<1	<1	2,504
NE SWTF Improvements	7	6	7	<1	<1	1,094
Regional Transmission Facilities	1	10	9	<1	<1	2,285
Total	**44**	**42**	**52**	**2**	**2**	**8,387**
SJVAPCD Thresholds of Significance	**10**	**10**	**NA**	**15**	**NA**	**NA**
Significant (Yes or No)?	**Yes**	**Yes**	**No**	**No**	**No**	**No**

a Project construction emissions estimates were made using CalEEMod, version 2013.2.2.
b Emissions shown are for the worst-case year.

Values in **bold** are in excess of the applicable SJVAPCD significance threshold. NA = Not Available. Emissions shown are for the worst year of a 14 year construction period.

SOURCE: ESA, 2013.

Mitigation Measures

Implementation of the following mitigation measures would reduce the fugitive dust and NO_x emissions from construction. Though the project would comply with Rule 9510, NO_x emissions would still be significant therefore the projects construction emissions would remain significant and unavoidable.

Measure 4.7.1a (NT/F): The City of Fresno shall comply with Regulation VIII Rule 8011 and implement the following dust control measures during all future project construction:

- The City of Fresno's general construction contractor shall submit a Dust Control Plan subject to review and approval of the SJVAPCD at least 30 days prior to the start of any construction activity on a site that includes 40 acres or more of disturbed surface area.

Specific control measures for construction, excavation, extraction, and other earthmoving activities required by the SJVAPCD include:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover in order to comply with Regulation VIII's 20 percent opacity limitation.
- All onsite unpaved roads and offsite unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water (at least two times per day) or by presoaking.
- When materials are transported offsite, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. However, the use of blower devices is expressly forbidden, and the use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- Any site with 150 or more vehicle trips per day shall prevent carryout and trackout.

Enhanced and additional control measures for construction emissions of PM_{10} shall be implemented where feasible. These measures include:

- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.

- Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site.
- Install wind breaks at windward side(s) of construction areas.
- Suspend excavation and grading activity when winds exceed 20 mph.
- Limit area subject to excavation, grading, and other construction activity at any one time.

Measure 4.7.1b (NT/F): Implementation Plans prepared by the City of Fresno for this project shall comply with Rule 9510 Indirect Source Review. Compliance with Rule 9510 would require reductions of 20 percent of the NO_x construction emissions and 45 percent of the PM_{10} construction exhaust emissions. If these emission reductions are not met, then the City of Fresno shall pay the required mitigation fees by the SJVAPCD.

Measure 4.7.1c (NT/F): Off-road construction equipment used on site shall achieve fleet average emissions equal to or less than the Tier II emissions standard of 4.8 NO_x g/hp-hr.

Significance After Mitigation: Significant and Unavoidable

Impact 4.7.2: Operation of the project could generate criteria air pollutant emissions that could contribute to existing nonattainment conditions and degrade air quality. (Less than Significant)

Near-Term and Future Project Elements

Use of motor vehicles to travel to and from project facilities associated with worker commuting and operational maintenance of project facilities would generate mobile sources of criteria pollutant emissions. Additionally, generation of electricity to serve the proposed project would result in emissions outside of the project area. Each of these operational sources is described below.

Mobile Sources. Operational emissions for the project would be generated primarily from on-road vehicular traffic. Implementation of the proposed project is not anticipated to result in large numbers of new employees (approximately 15 new employees). While the relocation of the City of Fresno Public Utilities Water Division Administrative Offices and Corporation Yard to SE SWTF would move a significant amount of employee to the SE SWTF, operational emissions associated with this project element would not represent a wholesale increase in new operational trips. Maintenance inspection of aboveground facilities (storage tanks, groundwater wells, groundwater recharge basins) would be serviced infrequently and on an as-needed basis. Similarly, maintenance of pipelines, which are located underground, would also be serviced on an as-need basis.

Operational emissions for buildout year 2025 are estimated in Table 4.7-7.

TABLE 4.7-7
NEAR AND FUTURE TERM PROJECT OPERATIONAL EMISSIONS (TONS PER YEAR)

Pollutant	SJVAPCD Thresholds (tons/yr)	Unmitigated Project On-road Traffic Emissions (tons/yr)[a] Year 2025
ROG	10	<1
NO_x	10	<1
PM_{10}	15	<1
$PM_{2.5}$	NA	<1
CO_2	NA	209
CO	NA	<1

a Emission factors were generated by the Air Board's EMFAC 2013 model for Fresno County. Additional information is provided in Appendix E. Emissions of CO_2 are the only values listed as metric tons.

Bold values are in excess of applicable standard. The SJVAPCD operational thresholds for ROG and NO_x are 10 tons per year, whereas CO, CO_2, and $PM_{2.5}$ do not have an established emissions threshold of significance. As described in the Methodology section above, PM_{10} has an assumed threshold of 15 tons per year for this analysis.

SOURCE: ESA, 2013

As shown in Table 4.7-7, the addition of traffic from project operations for each project element would result in a negligible increase in regional criteria air pollutant emissions.

Electricity. Proposed project facilities and pumps would be powered by the existing electrical grid and would not generate local emissions. Emissions would be generated at distant power plants where the power is created. The proposed project would not require significant electrical capacity, would utilize solar power and/or hydroelectric power as feasible, and ultimately would not be responsible for a substantial amount of emissions at the power source. In addition, power plant emissions are subject to the rules and regulations of the air district in which they are located and are subject to their own CEQA review. These emissions are, however, considered below under the evaluation of increases in emissions of GHGs.

In summary, the proposed project would not result in operational emissions that would exceed SJVAPCD's thresholds of significance, due to the negligible increase in vehicle trips. Consequently, the project-generated emissions would not be anticipated to result in a substantial contribution to a potential violation of NAAQS, CAAQS, or the nonattainment conditions. As a result, this impact would be less than significant.

Mitigation (NT/F): None required.

Impact 4.7.3: Construction and/or operation of the project could expose sensitive receptors to substantial pollutant concentrations. (Less than Significant)

Near-Term and Future Project Elements

Carbon Monoxide Hotspots

CO is a localized pollutant of concern. Due to the distance between construction activities and sensitive receptors, construction would not emit CO in quantities that could pose heath concerns.

Total vehicle trips associated with these operational features would be minimal. Due to the small amount of daily trips, the effect of project-related traffic on local CO concentrations along roadways and at intersections would also be negligible. Thus, mobile-source emissions of CO would not be anticipated to result in or contribute substantially to an air quality violation. The short-term construction and long-term operational mobile-source impact of the project on CO concentrations would be less-than-significant.

Toxic Air Contaminants

Construction of the project would result in short-term DPM, which are TACs, from on-site heavy-duty equipment. Project construction would generate DPM emissions from the use of off-road diesel equipment required for site grading and excavation, and other construction activities. The dose to which sensitive receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project. Thus, the duration of the both near-term and future project construction activities (more than 15 years) would only constitute approximately 20 percent of the total 70-year exposure period. Although some facilities would be stationary, the majority of construction emissions would be associated with pipeline construction activities, the location of which would change on a daily basis at approximately on average of 200 feet a day, and would therefore not result in extended exposure of residences to DPM. Because the use of mobilized equipment would be temporary and there are no sensitive receptors located immediately adjacent to areas where construction would occur for prolonged periods, DPM from construction activities would not be anticipated to result in the exposure of sensitive receptors to levels that exceed applicable standards.

In addition, the long-term operation of the project would not result in any non-permitted sources of toxic air emissions. As a result, exposure of sensitive receptors to substantial toxic air emissions from the project would be less than significant.

Mitigation (NT/F): None required.

Impact 4.7.4: The project could create objectionable odors affecting a substantial number of people. (Less than Significant)

Near-term and Future Project Elements

Types of land uses that typically pose potential odor problems include agriculture, wastewater treatment plants, food processing and rendering facilities, chemical plants, composting facilities, landfills, waste transfer stations, and dairies. In addition, the occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Because the generation and treatment of water is not considered a type of use that would generate potential odors, impacts to odors at nearby sensitive receptors would be less than significant.

Mitigation (NT/F): None required.

The cumulative context for air quality impacts is the San Joaquin Valley air basin.

Impact 4.7.5: Construction and operation of the project could result in a cumulatively considerable increase in greenhouse gas emissions. (Less than Significant)

Near-Term and Future Project Elements

Greenhouse gas impacts are considered to be exclusively cumulative impacts; there are no non-cumulative greenhouse gas emission impacts from a climate change perspective (CAPCOA, 2008). The project is Metropolitan Water Resources Management Plan Update for the City of Fresno. The project includes water treatment facilities, pipelines and pump stations, storage facilities, groundwater wells and groundwater recharge basins. The calculation presented below includes annual CO_2e GHG emissions from off-road equipment, trucks, and workers during construction and energy consumption and on-road vehicles associated with facility operations (described above in Impact 4.7.2). The Appendix F contains information regarding assumptions and emissions calculations used in this analysis.

With regard to Item a, the proposed project does not pose any apparent conflict with the CARB recommended actions.

With regard to Item b, project construction GHG emissions were estimated to be no more than 500 metric tons/year of CO_2e. No permanent employees or daily worker trips would be required to operate the pipeline; however, periodic inspection and maintenance would be conducted as needed. These trips would be negligible. Furthermore, no indirect electricity usage would be used during project operations. Therefore the project would not be classified as a major source of GHG emissions (the lower reporting limit, is 25,000 metric tons/year of CO_2e). The 2020 GHG emissions limit for California, as adopted by CARB in December of 2007 is approximately 427 million metric tons of CO_2e (CARB, 2007). The project's annual contribution would be insignificant, and therefore the project would not generate sufficient emissions of GHGs to contribute

considerably to the cumulative effects of GHG emissions such that it would impair the state's ability to implement AB 32.

With regard to Item c, the question of energy efficiency, the project would not require additional energy use and would permit the City to reduce or cease pumping from some of the wells and maximize the use of the surface water supplied by the transmission main, as part of a city-wide effort to reduce groundwater pumping.

With regard to Item d, the SJVAPCD released the *Final Staff Report: Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act* (SJVAPCD, 2009a) to streamline the process of determining if project specific GHG emissions would have a significant effect. The methodology being proposed relies on the use of performance based standards that would be applicable to projects that result in increased GHG emissions. Projects implementing best performance standards (BPS) or achieving at least a 29% GHG emission reduction compared to business as usual (BAU) would be determined to have a less-than-significant individual and cumulative impact for GHG. No BPS for water pipeline projects has been created thus far, and BPS standards as a whole have yet to be adopted by SJVAPCD. In summary, the review of Items a, b, c, and d indicate that the project would not conflict with the State goals in AB 32 and therefore this potential impact would be less than significant.

Indirectly, the project would develop the infrastructure necessary to provide a reliable drinking water supply to the City of Fresno and facilitate buildout of the General Plan through the year 2025. The indirect and cumulative effects of this growth could result in potentially significant climate change and GHG impacts. However, because implementation of the proposed project would facilitate planned growth and development consistent with the adopted 2025 Fresno General Plan, General Plan MEIR, and Air Quality MND, potentially significant climate change and GHG impacts would be mitigated to less than significant levels by existing goals, polices, and mitigations measures adopted by the City of Fresno contained within the 2025 Fresno General Plan, MEIR, and Air Quality Addendum. As a result potentially significant climate change and GHG impacts would be less than significant.

Mitigation (NT/F): None required.

Impact 4.7.6: Construction of proposed project facilities, when combined other development projects in the San Joaquin Valley air basin, would result in cumulative air quality impacts. (Significant)

Near-Term and Future Project Elements

According to the SJVAPCD GAMAQI, a cumulative impact occurs when two or more individual effects, considered together, are considerable or would compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant impacts, meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects. Notably, any project that would

individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact.

Construction emissions associated with the proposed project were found to produce a significant level of NO_x even after implementation of mitigation measures. Therefore potential construction emissions associated with the proposed Metro Plan Update, when considered in conjunction with air quality impacts associated with buildout of the Fresno 2025 General Plan, would be cumulatively considerable and, therefore, the cumulative impact would be significant.

Mitigation Measures

Implementation of the following mitigation measures would reduce the fugitive dust and NO_x emissions from construction. Though the project would comply with Rule 9510, NO_x emissions would still be significant therefore the projects construction emissions would remain significant and unavoidable.

Measure 4.7.6 (NT/F): Implement Mitigation Measure 4.7.1.

Significance After Mitigation: Significant and Unavoidable

Impact 4.7.7: Operation of proposed project facilities, when combined with other development projects in the San Joaquin Valley air basin, would result in cumulative air quality impacts. (Less than Significant)

Near-Term and Future Project Elements

According to the SJVAPCD *GAMAQI*, a cumulative impact occurs when two or more individual effects, considered together, are considerable or would compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant impacts, meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects. Notably, any project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact.

For operations, on-road traffic would be minimal and would result in a negligible increase in criteria pollutant emissions. Long-term project operations would result in a less-than-significant cumulative impact.

Mitigation (NT/F): None required.

4.8 Noise

This section provides background information on noise and vibration and applicable noise guidelines and standards, including City and County of Fresno noise standards. This section also assesses the potential for noise impacts from the proposed project.

4.8.1 Environmental Setting

Environmental Noise Fundamentals

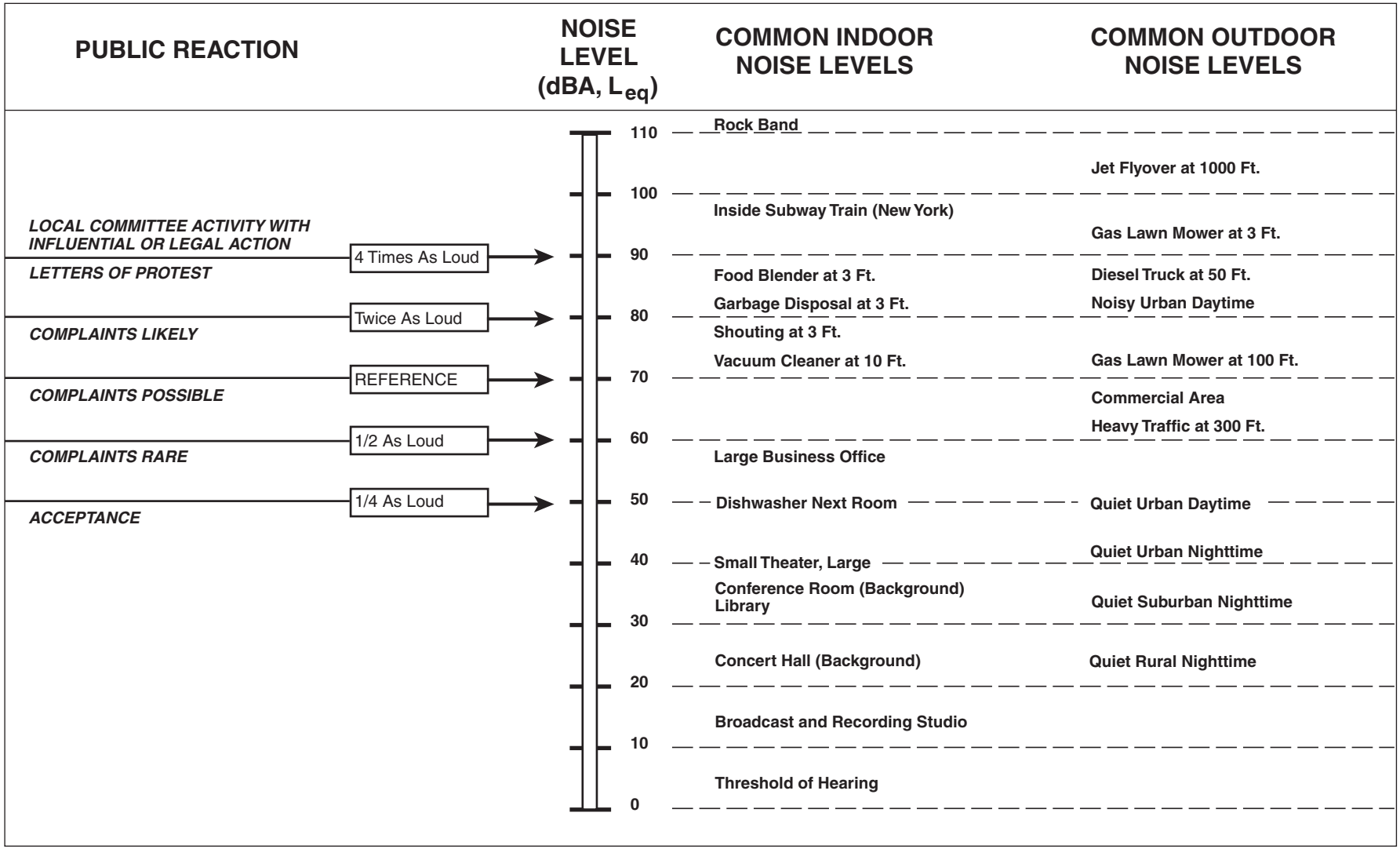
Noise is defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) which is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequencies spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to extremely low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. Some representative noise sources and their corresponding A-weighted noise levels are shown in Figure 4.8-1.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Figure 4.8-1 are representative of measured noise at a given instant in time, however, they rarely persist consistently over a long period of time. Rather, community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable.



SOURCE: ESA, 2013

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Figure 4.8-1
Effect of Noise on People

The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment vary the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

Leq	the equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The Leq is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period). Lmax the instantaneous maximum noise level for a specified period of time.
Ldn/or DNL	24-hour day and night A-weighted noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 PM and 7:00 AM is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.
CNEL	similar to the Ldn, the Community Noise Equivalent Level (CNEL) adds a 5-dBA penalty during the evening hours between 7:00 PM and 10:00 PM in addition to a 10-dBA penalty between the hours of 10:00 PM and 7:00 AM

As a general rule, in areas where the noise environment is dominated by traffic, the Leq during the peak-hour is generally equivalent to the Ldn at that location (within +/- 2 dBA) (Caltrans, 1998).

Effects of Noise on People

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

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, 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.

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 adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver such as parking lots or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement (Caltrans, 1998).

Fundamentals of Vibration

As described in the Federal Transit Administration's *Transit Noise and Vibration Impact Assessment* (FTA, 2006), ground-borne vibration can be a concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground-borne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving and operating heavy earth-moving equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the affect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly

used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly and sick), and vibration sensitive equipment.

The effects of ground-borne vibration include movement of building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 in/sec PPV (FTA, 2006).

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others because of the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, hotels, schools, rest homes, and hospitals are generally more sensitive to noise than commercial and industrial land uses.

Noise-sensitive land uses and proposed project facilities are located throughout the project area including numerous residences, schools, and hospitals along anticipated pipeline alignments and near proposed near-term and future facilities.

Sensitive receptors in the vicinity of the existing NE SWTF facilities are located approximately 300 to 350 feet west of single-family residences and a childcare facility across East Behymer Avenue. Riverview Elementary School is located approximately 500 feet south of existing NE SWTF facilities. Granite Ridge Intermediate and Clovis North High School are located approximately 1,500 feet north of existing NE SWTF facilities.

The nearest sensitive receptors to the proposed SE SWTF site are eight single family residences and Temperance-Kutner Elementary School, all located between 75 feet and 100 feet from the site boundary.

Existing Noise Environment

A Metrosonics Model db3080 sound level meter was used to measure the existing ambient noise levels at six locations in the project area, primarily along proposed transmission pipelines and at the existing NE SWTF. Noise levels measured at the existing NE SWTF would be representative of noise levels at proposed SE SWTF. The meter was calibrated to ensure the accuracy of the measurements. The noise measurement results are presented below in Table 4.8-1.

Pipelines are proposed along major roadways throughout the City and surrounding sphere of influence as shown on Figure 3-3. The existing noise environment in the vicinity of the pipelines is primarily influenced by traffic and transportation. In general major sources include traffic on Highways

41, 99, 168 and 180; traffic on railroads including Amtrak, Union Pacific, Burlington Northern Santa Fe, and Santa Fe Railway; and operations at the Fresno Yosemite International Airport, Sierra Sky Park Airport, and the Fresno Chandler Executive Airport.

In the vicinity of the NE SWTF the major noise sources are the NE SWTF operations, traffic on surrounding roadways, and residential uses (e.g. lawn mowing and leaf blowers). In the vicinity of the SE SWTF the major noise sources in addition to traffic are surrounding agricultural operations and the Fresno Yosemite International Airport located just over one mile to the northwest.

TABLE 4.8-1
EXISTING NOISE ENVIRONMENT IN PROJECT AREA[A]

Location	Time Period	Leq (dBA)	Noise Sources
ST-1: 50 feet from center of McKinley Avenue, west of Marks Avenue.	Thursday 8/12/10 12:21 – 12:31 PM	5-minute Average Noise Levels, Leq 64, 64	Noise from traffic on McKinley Avenue. Car, 76, 70 dBA
ST-2: 75 feet from center of Fruit Avenue.	Thursday 8/12/10 1:03 – 1:13 PM	5-minute Average Noise Levels, Leq 61, 61	Noise from traffic on Fruit Avenue and Bullard Avenue. Bus, 77 dBA Car, 76 dBA
ST-3: 75 feet from center of Intersection at Nees Avenue and Bond Street.	Thursday 8/12/10 1:34 – 1:44 PM	5-minute Average Noise Levels, Leq 69, 69	Noise from traffic mainly on McKinley Avenue. Bus, 81 dBA Diesel truck, 81 dBA
ST-4: Existing NE SWTF site on NE corner of SWTF property line.	Wednesday 1/15/14 8:45 – 8:55 PM	• 10-minute Average Noise Levels, Leq 49	Operational noise from equipment at existing NE SWTF
ST-5: Edge of housing community west of existing NE SWTF.	Wednesday 1/15/14 9:50 – 10:00 PM	• 10-minute Average Noise Levels, Leq 45	Noise from traffic
ST-6: 75 feet from center of Intersection at McKinley Avenue and Echo Avenue.	Thursday 8/12/10 5:10 – 5:20 PM	5-minute Average Noise Levels, Leq 66, 65	Noise from traffic mainly on McKinley Avenue. Bus, 77 dBA Car, 76 dBA

a All noise levels measured in decibels (dBA). Noise measurement data presented here using a Metrosonics dB-308 sound level meter, calibrated prior to use.

SOURCE: ESA, 2010, 2014.

4.8.2 Environmental Setting

Federal

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

State

The State of California requires each local government entity to include a noise element as part of its general plan. To support appropriate land use planning at the local level, Title 4 of the California Administrative Code presents guidelines that identify the noise levels that are compatible with various types of land uses. The state land use compatibility guidelines are shown in Figure 4.8-2.

The State of California also establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the federal limit of 80 dB. The State pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

The State has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (CCR Title 24). The noise insulation standards set forth an interior standard of DNL 45 dBA in any habitable room. They require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than DNL 60 dBA. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

Local

City of Fresno General Plan

The 2025 City of Fresno General Plan, Noise Element (2002), includes the following policies applicable to the project:

Policy H-1-b For purposes of city analyses of noise impacts, and for determining appropriate noise mitigation, a significant increase in ambient noise levels is assumed if the project causes ambient noise levels to exceed the following:

- the ambient noise level is less than 60 dB Ldn and the project increased noise levels by 5 dB or more.
- the ambient noise level is 60-65 dB Ldn and the project increases noise levels by 3 dB or more
- the ambient noise level is greater than 65 dB Ldn and the project increases noise levels by 1.5 dB or more.

Policy H-1-l Noise created by new proposed stationary noise sources or exiting stationary noise sources which undergo modifications that may increase noise levels shall be mitigated so as not to exceed the noise level standards of (Table 4.8-2) at noise-sensitive land uses.

	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

SOURCE: State of California, Governor's Office of Planning and Research, 2003. *General Plan Guidelines*.

Figure 4.8-2
Land Use Compatibility for Community Noise Environment

TABLE 4.8-2
MAXIMUM NOISE EXPOSURE –STATIONARY NOISE SOURCES

	Daytime (7 am to 10 pm)	Nighttime (10 pm to 7 am)
Hourly Equivalent Sound Level (Leq), dB	50	45
Maximum Sound Level (Lmax), dB	70	65

NOTE: As determined at outdoor activity areas. Where the location of outdoor activity areas is unknown or not applicable, the noise exposure shall be applied at the property line of the receiving land use. When ambient noise levels exceed or equal the levels in this table, mitigation shall only be required to limit noise to the ambient plus five (5) dB.

SOURCE: City of Fresno, 2002. 2025 Fresno General Plan Noise Element, Table 9.

City of Fresno Municipal Code

The City of Fresno Noise Ordinance is defined in Chapter 10, Article 1 of the City Municipal Code (2013). The Noise Ordinance provides maximum noise thresholds as summarized in Table 4.8-3.

TABLE 4.8-3
CITY OF FRESNO NOISE THRESHOLDS

District	Time	Sound Level (dBA)
Residential	10pm - 7am	50
	7 pm – 10 pm	55
	7 am – 7 pm	60
Commercial	10 pm – 7 am	60
	7 am – 10 pm	65
Industrial	anytime	70

SOURCE: City of Fresno, 2013. Municipal Code of the City of Fresno, Chapter 10, Article 1, Noise Regulations.

A construction noise exemption is included in the Municipal Code stating that the Noise Ordinance does not apply to "construction, repair or remodeling work accomplished pursuant to a building, electrical, plumbing, mechanical, or other construction permit issued by the city of other governmental agency, or to site preparation and grading, provided such work takes place between the hours of 7:00 am and 10:00 pm on any day excluding Sunday.

County of Fresno General Plan

The Fresno County General Plan Health and Safety Element (2000) includes the following policies applicable to noise outside of the City sphere of influence:

Policy HS-G.5 Where noise mitigation measures are required to achieve acceptable levels according to land use compatibility or the Noise Control Ordinance, the County shall place emphasis of such measures upon site planning and project design. These measures may include, but

are not limited to, building orientation, setbacks, earthen berms, and building construction practices.

The County shall consider the use of noise barriers, such as soundwalls, as a means of achieving the noise standards after other design-related noise mitigation measures have been evaluated or integrated into the project.

Policy HS-G.6 The County shall regulate construction-related noise to reduce impacts on adjacent uses in accordance with the County's Noise Control Ordinance.

Policy HS-G.8 The County shall evaluate the compatibility of proposed projects with existing and future noise levels through a comparison to Chart HS-1, "Land Use Compatibility for Community Noise Environments.

For noise-sensitive land uses including single family and multi-family residential, schools, libraries, churches, hospitals and nursing homes Chart HS-1 has an outdoor community noise exposure Ldn or CNEL standard of up to 60 dB as normally acceptable, between 60 and 65 dB as conditionally acceptable, and above 65 dB as generally unacceptable or discouraged.

Fresno County Code of Ordinances

The County of Fresno noise standards are defined in Title 8, Chapter 8.40 of the County Code of Ordinances (2013). Table 4.8-4 summarizes the exterior noise standards for a noise sensitive land use, specifically a single- or multiple-family residence, school, hospital, church or public library.

TABLE 4.8-4
COUNTY OF FRESNO EXTERIOR NOISE STANDARDS

Cumulative Number of Minutes in Any One-Hour Time Frame	Daytime (7 am to 10 pm), dBA	Nighttime (10 pm to 7 am), dBA
30	50	45
15	55	50
5	60	55
1	65	60
0	70	65

SOURCE: County of Fresno, 2013. Ordinance Code of the County of Fresno, Chapter 8.40 Noise Control.

Temporary noise sources which are exempted from meeting this standard include: noise sources associated with construction, provided such activities do not take place before 6 am or after 9 pm on any day except Saturday or Sunday, or before 7 a.m. or after 5 p.m. on Saturday or Sunday; noise sources associated with work performed by private or public utilities in the maintenance or modification of its facilities; and noise sources associate with the drilling or re-drilling of petroleum, gas, injection or water wells.

4.8.3 Impacts and Mitigation Measures

Method of Analysis

Noise impacts are assessed based on a comparative analysis of the noise levels resulting from the project and the noise levels under existing conditions. Analysis of temporary construction noise effects is based on typical construction phases and equipment noise levels and attenuation of those noise levels due to distances, and any barriers between the construction activity and the sensitive receptors near the sources of construction noise.

Reference noise levels and attenuation for operational equipment, to find how much noise the proposed project would contribute to the area, were used to analyze operational noise impacts.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Exposure of persons to or generation of noise levels in excess of standards in the City of Fresno Municipal Code, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels existing without the project;
- Exposure of people residing or working in the project area to excessive noise levels, for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport; or
- Expose people residing or working in the project area to excessive noise levels if the project is located in the vicinity of a private airstrip.

Construction Noise

The City of Fresno Municipal Code and County of Fresno Ordinance Code exempt construction noise during certain daytime hours. Construction noise occurring outside of these hours would be subject to the criteria in Tables 4.8-3 and 4.8-4. The County also provides an exemption for work performed by public utilities in the maintenance or modification of its facilities.

Construction Vibration

Vibration from construction is evaluated for potential impacts at sensitive receptors. Typical activities evaluated for potential building damage due to construction vibration include demolition, pile driving, and drilling or excavation in close proximity to structures. The ground-borne vibration is also evaluated for perception to eliminate annoyance. Vibration propagates according to the following expression, based on point sources with normal propagation conditions:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

Where PPV (equip) is the peak particle velocity in inches per second of the equipment adjusted for distance, PPV (ref) is the reference vibration level in inches per second at 25 feet, and D is the distance from the equipment to the receiver. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration and is often used in monitoring vibration because it is related to the stresses experienced by structures.

To determine the potential for annoyance, the RMS vibration level (L_v) at any distance (D) is estimated based on the following equation:

$$L_v(D) = L_v(25 \text{ ft}) - 30\log(D/25)$$

This analysis uses the FTA's threshold of architectural damage for conventional sensitive structures (0.2 in/sec PPV) and the FTA threshold of human annoyance to ground-borne vibration (80 RMS; to evaluate project impacts (FTA, 2006).

General Operations Noise

Table 4.8-5 summarizes the guidance in the City of Fresno General Plan (Policy H-1-b) for determining a significant change in ambient noise levels. This guidance is the same as the suggested measure of substantial noise increase proposed by the 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations.

TABLE 4.8-5
MEASURES OF SUBSTANTIAL INCREASE FOR NOISE EXPOSURE

Ambient Noise Level without Project (Ldn)	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels By:
<60 dB	+ 5.0 dB or more
60-65 dB	+ 3.0 dB or more
>65 dB	+ 1.5 dB or more

SOURCE:City of Fresno , 2002. General Plan, Noise Element; Federal Interagency Committee on Noise (FICON), 1992.

The rationale for the Table 4.8-6 criteria is that, as ambient noise levels increase, a small increase in decibel levels is sufficient to cause significant annoyance. The quieter the ambient noise level is, the more the noise can increase (in decibels) before it causes significant annoyance.

Stationary Noise

A resulting off-site noise level at residences and other sensitive receptors from stationary, non-transportation sources that exceed levels in Table 4.8-2 would result in a significant noise impact.

Traffic Noise

As described in Table 4.8-6, the proposed project would result in a significant traffic noise impact if mobile noise would result in increased noise levels of 1.5 dBA Ldn or more in an ambient noise environment greater than 65 dBA Ldn; or increased noise of 3 dBA Ldn or more in an ambient noise

environment between 60 and 65 dBA Ldn; or increased noise of 5 dBA Ldn or more in an ambient environment of less than 60 dBA Ldn. These thresholds are representative of noise increases that could adversely affect sensitive receptors along the roadway

Impacts and Mitigation Measures

Table 4.8-6 provides a summary of the impact analysis for issues related to noise.

TABLE 4.8-6
PROPOSED PROJECT IMPACT SUMMARY – NOISE

	Near-Term Project Elements		Future Project Elements	
Impact	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.8-1 Project construction could temporarily increase noise levels at nearby sensitive receptor locations.	S	LS	S	LS
Impact 4.8-2 Project construction could expose persons and structures to ground-borne vibration or ground-borne noise levels.	S	LS	S	LS
Impact 4.8-3 Activities associated with operation of proposed project facilities could increase ambient noise levels at nearby land uses.	LS	NA	LS	NA
Impact 4.8-4 Operation of project facilities in the vicinity of an airport could expose employees to excessive noise levels.	LS	NA	NA	NA
Impact 4.8-5 Construction of the proposed project, when combined with construction of other future projects, could increase noise levels at nearby sensitive receptor locations.	S	LS	S	LS
Impact 4.8-6 Operation of proposed project facilities, when combined with operation of other future projects, could increase noise levels at nearby sensitive receptor locations.	LS	NA	LS	NA

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less than Significant Impact
NA = Not Applicable

Impact 4.8.1: Project construction could temporarily increase noise levels at nearby sensitive receptor locations. (Significant)

Noise levels associated with the installation of pipelines, and construction of facilities would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Tables 4.8-7 and 4.8-8 show typical noise levels during different construction stages and those produced by various types of construction equipment.

TABLE 4.8-7
TYPICAL NOISE LEVELS FROM CONSTRUCTION ACTIVITIES AND CONSTRUCTION EQUIPMENT

Construction Phase	Noise Level[a] (dBA, Leq)
Ground clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

a Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

SOURCE: Bolt, Baranek, and Newman, 1971; Cunniff, 1977.

TABLE 4.8-8
TYPICAL NOISE LEVELS FROM CONSTRUCTION ACTIVITIES AND CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level[a] (dBA, Leq at 50 Feet)
Dump truck	88
Portable air compressor	81
Concrete mixer (truck)	85
Scraper	88
Jackhammer	88
Dozer	87
Paver	89
Generator	76
Backhoe	85
Rock Drilling	98

a Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

SOURCE: Bolt, Baranek, and Newman, 1971; Cunniff, 1977.

Near-Term and Future Project Elements

The loudest portion of site construction would occur during excavation activities. As shown in Table 4.8-7 excavation noise levels are 89 dBA at 50 feet. The nearest sensitive receptors to near-term project elements are single family residences located approximately 100 feet from the SE SWTF; 30 feet from transmission pipeline routes; and 300 feet from the existing NE SWTF. Assuming an attenuation rate of 6 dBA per doubling of distance, a receptor at 100 feet would experience noise levels of approximately 83 dBA Leq, 93 dBA Leq at 30 feet, and 73 dBA Leq. Other sensitive receptors located further away from construction would be exposed to construction noise at incrementally lower levels. In order for excavation noise to be below the daytime residential threshold of 60 dBA, it would have to occur at an approximate distance of 1,500 ft from a sensitive receptor. If jack and bore drilling were to be used at this distance during construction the sensitive receptor would be exposed to noise levels of approximately 98 dBA Leq.

Noise during construction would exceed the City of Fresno maximum permissible sound levels. Pipeline construction; however, would be short-term in duration and would expose sensitive receptors to temporary increases in noise levels because the construction activities would move as the pipeline is installed. Furthermore, construction activities that occur between 7 a.m. and 6 p.m. on Monday through Saturday would be exempt from the City of Fresno Municipal Code noise thresholds. However, if construction activities within 1,500 feet of a sensitive receptor were to occur outside of these times/days, sensitive receptors could be exposed to increased noise in excess of the Municipal Code. This would be a significant impact.

Noise generated by construction of facilities in Fresno County would be exempt because the proposed project involves the construction of water supply infrastructure.

As discussed in Section 4.6, Transportation, construction worker travel and material haul trips (from spoils and pipelines) would create traffic; however, this traffic would not be substantial relative to background traffic conditions, nor would project traffic significantly disrupt daily traffic flow on area roadways. Project-generated truck trips would be spread over the course of the work day, and construction workers would commute to and from the worksite primarily before or after peak traffic hours. For these reasons, construction traffic would not create a significant increase in ambient noise levels.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by imposing measures to reduce noise during construction when activities occur adjacent to sensitive receptors.

> **Measure 4.8.1 (NT/F):** The City and its contractors shall implement the following mitigation measures when project-related construction in the City is planned to occur within 1,500 feet of sensitive receptors:
>
> - Sensitive receptors (residences, residential areas, schools, and hospitals) within 1,500 of project construction activities shall be identified and mapped, and this information shall be used to minimize noise impacts to sensitive receptors.
>
> - Construction activities shall meet municipal code requirements related to noise. Construction activities shall be limited to between 7 a.m. and 6 p.m. Monday through Saturday to avoid noise-sensitive hours of the day. Construction activities shall be prohibited on Sundays and holidays.
>
> - Construction equipment noise shall be minimized by muffling and shielding intakes and exhaust on construction equipment (per the manufacturer's specifications) and by shrouding or shielding impact tools.
>
> - Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. External jackets on the tools themselves shall

be used where feasible. Quieter procedures, such as use of drills rather than impact tools, shall be used whenever feasible.

- Construction contractors shall locate fixed construction equipment (such as compressors and generators) and construction staging areas as far as possible from nearby sensitive receptors including residences, schools, and hospitals.

- If construction were to occur near a school, the construction contractor shall coordinate with the most noise producing construction activities with school administration in order to limit disturbance to the campus.

- Signs shall be posted at constructions sites that include permitted construction days and hours, a day and evening contact number for the job site, and a contact number in the event of problems.

- An onsite complaint and enforcement manager shall respond to and track complaints and questions related to noise.

Significance After Mitigation: Less than Significant

Impact 4.8.2: Project construction could expose persons and structures to ground-borne vibration or ground-borne noise levels. (Significant)

Near-Term and Future Project Elements

Typical activities that could generate ground-borne vibration during construction include demolition, pile driving, and drilling or excavation in close proximity to structures. Vibration associated with noise, which takes the form of oscillatory motion, can be described in terms of acceleration, velocity, and displacement. There are several different methods that are used to quantify vibration. The PPV is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The RMS amplitude is most frequently used to describe the affect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal.

The FTA's threshold of architectural damage for conventional sensitive structures is 0.2 in/sec PPV and the FTA threshold of human annoyance to ground-borne vibration is 80 RMS (FTA, 2006). Construction of the project would employ conventional activities and the equipment/techniques to be used would not cause excessive ground-borne vibration; however drilling would be required during pipeline installation at major intersections and railways. As shown in Table 4.8-9, use of heavy equipment during construction generates vibration levels of up to 0.089 PPV or 87 RMS (large bulldozer/drilling) at a distance of 25 feet. The proposed pipeline could get as close as 42 feet from sensitive receptors to be below the annoyance threshold of 80 RMS and 15 feet from a structure to be below the potential building damage threshold of 0.2 PPV. However, if construction activities within 42 feet of a sensitive receptor were to occur, sensitive receptors could be exposed to ground-borne vibration or ground-borne noise in excess of FTA standards. This would be a significant impact.

TABLE 4.8-9
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Construction Equipment	PPV at 25 feet (inches/second)[a]	RMS at 25 feet (VDB)[b]
Loaded Trucks	0.076	86
Caisson Drilling	0.089	87
Large Bulldozer	0.089	87
Jackhammer	0.035	79

a. Buildings can be exposed to ground-borne vibration levels of 0.2 PPV without experiencing structural damage.
b. The human annoyance response level is 80 RMS.

SOURCE: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

Mitigation Measures

Implementation of the following mitigation measure would reduce this impact to a less-than-significant level by imposing measures to reduce noise associated with ground vibration when activities are to occur adjacent to sensitive receptors.

Measure 4.8.2 (NT/F): The City and its contractors shall implement the following measures when project-related construction is planned to occur within the City limits and/or within 1,500 feet of sensitive receptors:

- Sensitive receptors (residences, residential areas, schools, and hospitals) within 1,500 of project construction activities shall be identified and mapped, and this information shall be used to minimize ground-borne vibration and ground-borne noise impacts to sensitive receptors.
- Limit jack and bore drilling to 45 feet from sensitive receptors and 15 feet from any structures.
- If jack and bore drilling must occur within 15 feet of any structure, the construction contractor shall conduct crack surveys before drilling to prevent potential architectural damage to nearby structures. The surveys shall be done by photographs, video tape, or visual inventory, and shall include inside as well as outside locations. All existing cracks in walls, floors, and driveways shall be documented with sufficient detail for comparison after construction to determine whether actual vibration damage occurred. A post-construction survey shall be conducted to document the condition of the surrounding buildings after the construction is complete.

Significance After Mitigation: Less than Significant

Impact 4.8.3: Activities associated with operation of proposed project facilities could increase ambient noise levels at nearby land uses. (Less than Significant)

Near-Term Project Elements

The proposed project near- term elements include expansion of the existing NE SWTF and development of a new SE SWTF. The proposed SE SWTF site is currently undeveloped in an area designated as light industrial. Operation of the facility would expose surrounding uses, including

existing residences, to increased noise over current conditions. The SE SWTF would operate continuously, 24 hours per day, year-round at various flow rates during the year. Operational noise levels would be anticipated to be similar to the existing NE SWTF. In addition to the treatment process, uses at the SE SWTF would include administrative and corporation yard uses, relocated from current Water Division facilities which would result in vehicle trips in and out of the site. The facility would also include an emergency electrical generator and hydro turbines to help power the facility and an on-site pump station.

Assuming operations at the new SE SWTF would be similar to the existing NE SWTF, operational noise levels would be approximately 51 dBA at 100 feet (see Table 4.8-1). The nearest sensitive receptors are existing residences located approximately 75 to 100 feet from the proposed SE SWTF property line. At this distance, operational noise levels would not exceed City of Fresno daytime noise threshold for industrial areas (70 dBA) or residential uses (60 dBA). However, they could slightly exceed the residential nighttime threshold of 50 dBA. The proposed project would include installation of landscaping along the perimeter of the site which would help attenuate noise. In addition, proposed pump (for Conveyance Option 1) and the emergency generator would be placed in enclosed structures that would minimize noise from this equipment. Even though the proposed use would create noise at levels below the threshold for light industrial uses, existing residences could be exposed to night time noise that exceeds residential noise thresholds.

Near-term project elements also include the expansion of the existing NE SWTF. As previously noted, measured noise levels are approximately 49 dBA at the northeast property line of the NE SWTF which is below the City's nighttime noise threshold. Surrounding uses at this site include vehicle trips and residential uses within approximately 75 to 100 feet of the site boundary which contribute to the ambient noise levels. The proposed modifications to the NE SWTF are not anticipated to change operational noise levels substantially over existing conditions.

Operations of the transmission pipelines would not result in a permanent increase of ambient noise during operations. Associated appurtenances would primarily be located in underground vaults and would also not be anticipated to contribute an increase in operational noise levels. Operational vehicle trip increases would be minimal and would not generate a substantial increase in noise along local roadways. As a result, pipeline development would not permanently increase ambient noise levels in the area and potential impacts would be less-than-significant.

Future Project Elements

Operational noise from long term projects at existing facilities are not expected to change from existing conditions, nor result in noise levels that exceed applicable significance thresholds. Operational vehicle trip increases at existing facilities would be minimal and would not generate a substantial increase in noise along local roadways. As a result, implementation of the long term projects would not permanently increase ambient noise levels in the area and potential impacts would be less-than-significant.

Operations and maintenance of the proposed SW SWTF would be anticipated to occur in a manner similar to the operation of the existing NE SWTF. As shown in Table 4.8-1 the existing treatment plant produces approximately 49 dBA at the northeast property line of the NE SWTF which is below the City's nighttime noise threshold.

Summary

Near-term and future project elements would not result in a significant increas in ambient noise levels above existing conditions. Nighttime noise measurements taken at the NE SWTF showed that the existing NE SWTF produces approximately 49 dBA at the northeast property line, which is below the City's nighttime noise threshold. Proposed improvements at the NE SWTF and construction of the proposed SE SWTF and SW SWTF would result in similar operational noise levels as those observed at the NE SWTF. In addition, the proposed facilities would implement noise attenuating measures such as enclosures around mechanical equipment, sound walls or barriers, and the planting of landscaping in areas adjacent to sensitive receptors which would further reduce noise levels. . Therefore, this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

Impact 4.8.4: Operation of project facilities in the vicinity of an airport could expose employees to excessive noise levels. (Less than Significant)

Near-Term Project Elements

The proposed SE SWTF building is within two miles of the Fresno-Yosemite International Airport just outside the 65 CNEL noise contour. The City of Fresno Municipal Code does not specify a noise threshold for public facilities but 65 dBA is at or below the noise threshold for other non-residential uses such as commercial and industrial uses. Based on the threshold for other non-residential uses, future employees on the project site would not be subjected to excessive noise levels and exposure to airport noise would be a less-than-significant impact.

Mitigation (NT): None required.

The cumulative context for noise impacts would be construction and operation of projects in and adjacent to the City's SOI that could affect the same sensitive receptors as proposed project facilities.

Impact 4.8.5: Construction of proposed project facilities, when combined with construction of other future projects, could increase noise levels at nearby sensitive receptor locations. (Significant)

Near-Term and Future Project Elements

Construction of the project combined with other projects in and adjacent to the City of Fresno SOI could generate noise and vibration that would affect existing ambient noise conditions in the

region and could affect the same sensitive receptors. Construction of some projects could occur simultaneously and within the same streets as the project. This could result in a cumulative increase in noise levels, which could adversely impact sensitive receptors. The contribution of the proposed project could be considerable if activities were to occur at the same time. This is considered a significant cumulative impact

If construction were to occur in Fresno County jurisdiction, noise from construction activities would be exempt due to the project being a utilities project.

Mitigation Measures

Implementation of the following mitigation measures would reduce the proposed project's contribution to less than considerable because it would restrict construction activities to daytime hours and impose measures to reduce noise associated with ground vibration when activities are to occur adjacent to sensitive receptors. Therefore, this cumulative impact would be less than significant.

Measure 4.8.5 (NT/F): Implement Mitigation Measures 4.8.1 and 4.8.2.

Significance After Mitigation: Less than Significant

Impact 4.8.6: Operation of proposed project facilities, when combined with operation of other future projects, could increase noise levels at nearby sensitive receptor locations. (Less than Significant)

Near-Term and Future Project Elements

Other projects operating in the City or County adjacent to proposed project facilities could contribute to noise levels that exceed applicable thresholds and result in a significant cumulative effect. However, because the proposed project would not result in operational noise levels that exceed the applicable City or County noise level thresholds for sensitive receptors the proposed project's contribution is not cumulatively considerable and this is considered a less than significant cumulative impact. In addition, the proposed SWTFs would implement noise attenuating measures such as enclosures around mechanical equipment, sound walls or barriers, and the planting of landscaping in areas adjacent to sensitive receptors which would further reduce noise levels.

Mitigation (NT/F): None required.

4.9 Hazards and Hazardous Materials

This section describes existing and potential hazards that may be affected or that may result from construction and operation of the proposed project. This section also provides an overview of applicable laws and regulations related to hazards and hazardous materials.

Comments received on the NOP noted concerns regarding proximity of project elements to existing airports and potential for increases in wildlife strikes (see Appendix B).

4.9.1 Environmental Setting

The proposed project area consists primarily of urbanized land covered by a mix of residential, commercial and industrial land uses. Commercial land uses that involve hazardous materials include service stations, dry cleaners, automobile repair facilities, and similar operations that use petroleum fuels, oils, pesticides, fertilizers, volatile organic compounds, and others. These uses can range from bulk storage of diesel and gasoline in aboveground and underground storage tanks to small quantities of hazardous materials. A variety of potential hazardous materials sources originate from urban land uses and can include soil and groundwater contamination from gasoline service stations, releases from industrial operations that rely on solvents or other caustic and poisonous chemicals, and other hazardous material handlers.

Smaller portions of the project area consist of rural and agricultural areas. In particular, areas within the City's SOI are currently used for agricultural production. There are also sections of Fresno that are currently undeveloped and may have been previously used for agricultural or industrial purposes. Both rural and urban sources of hazardous materials are present in the existing environment within the project area, and if encountered by workers or the general public, can cause exposure that could result in adverse environmental and health effects.

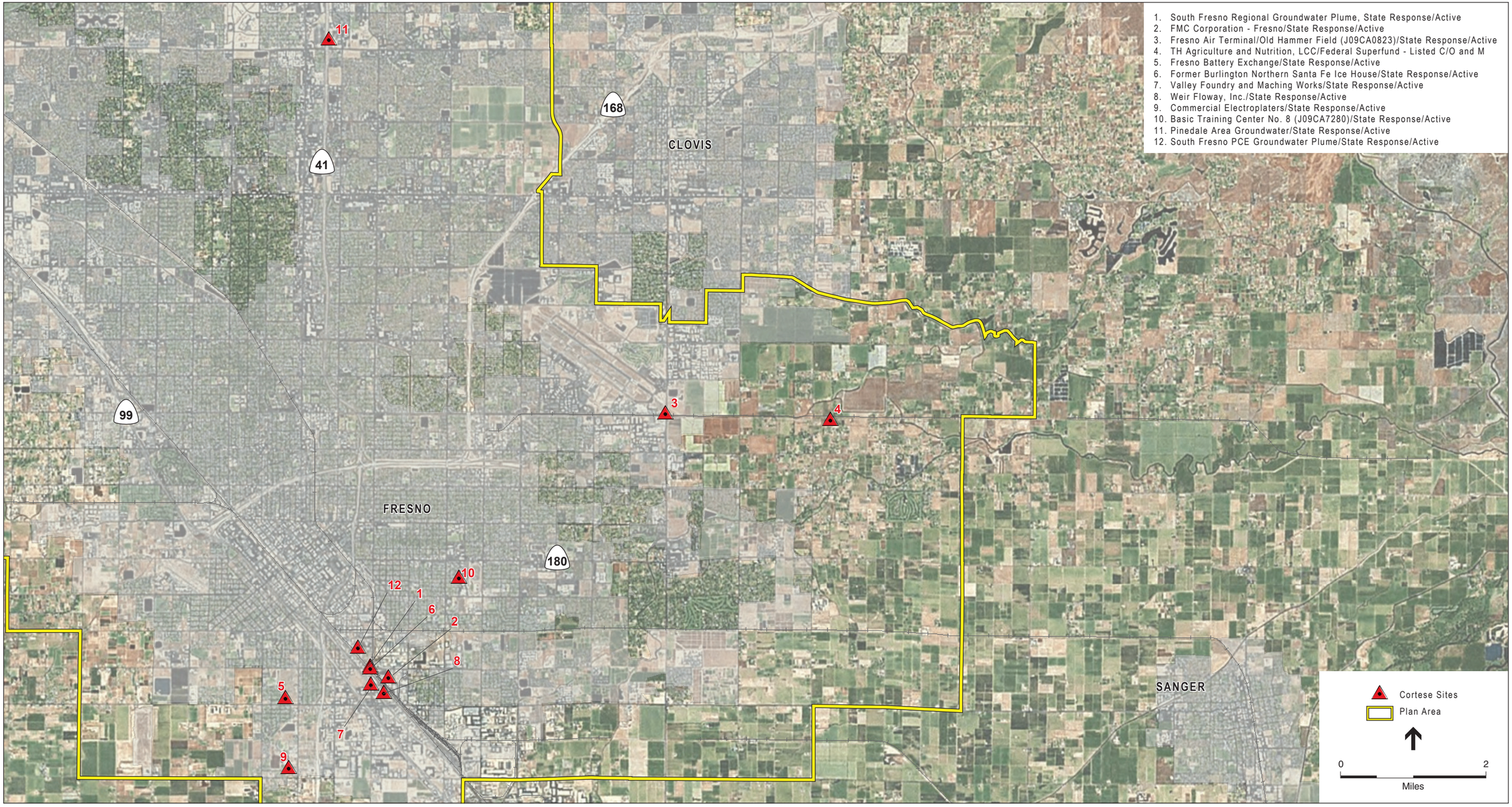
The Fresno-Yosemite International Airport, Fresno Chandler Executive Airport, and the Sierra Sky Park are the major airports located in the plan area. The proposed project area also includes private airstrips used for agricultural or recreational purposes. These are scattered across rural portions of the proposed project area (CDF, 2009).

The California Department of Toxic Substances Control (DTSC) Hazardous Waste and Substances Sites (Cortese) List is a reporting document used by the state, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials release sites. The Cortese List is updated at least annually, in compliance with California regulations (California Code Section 65962.5(a)(4)). The Cortese List includes federal superfund sites, state response sites, non-operating hazardous waste sites, voluntary cleanup sites, and school cleanup sites. Table 4.9-1 identifies the Cortese sites within the proposed project area. Figure 4.9-1 shows the Cortese sites location in the proposed project area.

TABLE 4.9-1
LIST OF CORTESE SITES FOUND IN THE PROPOSED PROJECT AREA

Site Name	Site Type	Status	Address Description	City	Portion of Project
South Fresno Regional Groundwater Plume	State Response	Active	North of Church Avenue at South East Ave	Fresno	Within 500 feet of Regional Transmission Main from SE SWTF
FMC Corporation - Fresno	State Response	Active	2501 South Sunland Avenue	Fresno	Within 500 feet of Regional Transmission Main from SESWTF
Fresno Air Terminal/Old Hammer Field (J09CA0823)	State Response	Active	McKinley And Clovis Avenues	Fresno	Within 500 feet of 16" Main from SE SWTF; within 1 mile of SE SWTF
T H Agriculture & Nutrition, L.L.C.	Federal Superfund - Listed	Certified / Operation & Maintenance - Land Use Restrictions	7183 East McKinley Avenue	Fresno	Within ½ mile of Regional Transmission Main from SESWTF; Within 1 mile of SE SWTF
Former Burlington Northern Santa Fe Ice House	State Response	Active	3090 E Church Ave	Fresno	Within 500 feet of Regional Transmission Main from SE SWTF
Valley Foundry And Machine Works	State Response	Active	2510 South East Avenue	Fresno	Within 1,000 feet of Regional Transmission Main from SE SWTF
Weir Floway Inc.	State Response	Active	2494 South Railroad Avenue, P.O. Box 164	Fresno	Adjacent to Regional Transmission Main from SE SWTF
Commercial Electroplaters	State Response	Active	2940 South Elm Avenue	Fresno	Within 500 feet of the 16" main from the SE SWTF; adjacent to a future groundwater well
Pinedale Area Groundwater	State Response	Active	Pinedale/N. Fresno Area	Fresno	Within 2 miles of Regional Transmission Main from NE SWTF
Fresno Sanitary Landfill	Federal Superfund – Listed	Active	Jensen Avenue & West Avenue	Fresno	Within 2 miles of SWTF; within 0.5 mile of proposed future wells.
South Fresno PCE Groundwater Plume	State Response	Active	South Fresno	Fresno	Within 1 mile of Regional Transmission Main from SESWTF

SOURCE: DTSC (2013).



SOURCE: Bing Maps, 2009; DTSC, 2010; ESA, 2013

Figure 4.9-1
Cortese Sites Found in the Plan Area

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4.9.2 Regulatory Setting

The following subsections present information on the applicable standards for the management of hazardous materials and nonhazardous and hazardous waste. Hazardous materials handling is subject to numerous laws and regulations at all levels of government. Federal and State laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and in the event that such materials are accidentally released into the environment, to prevent or to mitigate injury to human health or the environment.

Federal

Hazardous materials are governed under these three federal regulations: Occupational Safety and Health Administration, Resource Conservation and Recovery Act (RCRA), and the Toxic Substance Control Act (TSCA).

OSHA

Worker safety is regulated through the federal OSHA. Federal OSHA, established in CFR Title 29, requires 40 hours of training for hazardous materials operators, plus eight hours of refresher training per year. The training includes personal safety, hazardous materials storage and handling procedures, and emergency response procedures.

Resource Conservation and Recovery Act

Under the federal RCRA, individual states may implement their own hazardous waste programs in lieu of the RCRA as long as the state program is at least as stringent as federal RCRA requirements and is approved by the EPA. The EPA approved California's RCRA program, called the Hazardous Waste Control Law (HWCL), in 1992. Since that time, California EPA and DTSC, a department within Cal EPA, meets RCRA by regulating the generation, transportation, treatment, storage, and disposal of hazardous waste. DTSC has primary hazardous materials regulatory responsibility, but can delegate enforcement responsibilities to local jurisdictions that enter into agreements with DTSC for the generation, transport, and disposal of hazardous materials under the authority of the HWCL (City of Fresno, 2002).

Toxic Substance Control Act

The TSCA of 1976 was enacted by Congress to give the EPA the ability to track the 75,000 industrial chemicals currently produced or imported into the United States. The EPA repeatedly screens these chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. The EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

Hazardous Materials Transportation

The U.S. Department of Transportation (DOT) regulates hazardous materials transportation on all interstate roads. Within California, the state agencies with primary responsibility for enforcing federal and state regulations and for responding to transportation emergencies are the California

Highway Patrol (CHP) and Caltrans. Together, federal and state agencies determine driver training requirements, load labeling procedures, and container specifications. Although special requirements apply to transporting hazardous materials, requirements for transporting hazardous waste are more stringent, and hazardous waste haulers must be licensed to transport hazardous waste on public roads.

Airport Wildlife Hazards

The Federal Aviation Administration (FAA) provides guidance on certain land uses that have potential to attract wildlife on or near public-use airports. FAA guidelines recognize the considerable potential damage that can occur as a result of wildlife strikes by aircraft, including potential for injury and loss of human life. The FAA's Advisory Circular on Hazardous Wildlife Attractants on or Near Airports (AC No. 150/5200-33B) provides various guidelines for the siting of certain land uses near public use airports. Land uses considered in the circular, where chance of wildlife strike may be increased, include waste disposal and transfer operations, composting operations, recycling centers, water stormwater management facilities, wastewater treatment facilities, artificial marshes or wetlands, wastewater discharge, sludge disposal, natural wetlands, dredge spoil containment areas, agricultural activities, golf courses, and certain other categories of landscaping. Adherence to FAA wildlife hazards requirements is implemented through grant assurances to which the City is subject. These include assurances for (1) hazard removal and mitigation within airspace needed to protect visual and instrument operations, and (2) City implementation of appropriate planning actions to ensure that land uses located near a public airport would not reduce compatibility with that airport.

State

Hazardous materials are governed under these four California regulations: California OSHA (Cal OSHA), CCR, the California Hazardous Materials Release Response Plans and Inventory Law, and the Unified Hazardous Materials Management Regulatory Program.

California OSHA

Cal OSHA regulates California worker safety similarly to the federal OSHA. OSHA has developed worker safety regulations for the safe abatement of lead-based paint and primers (Lead in Construction Standard, Title 8 CCR 1532.1).

California Code of Regulations

The CCR, Title 22, Section 66261.20-24 contains technical descriptions of characteristics that would classify a soil as a hazardous waste. When excavated, soils having concentrations of contaminants higher than certain acceptable levels must be handled and disposed as hazardous waste.

California Hazardous Materials Release Response Plans and Inventory Law

The California Hazardous Materials Release Response Plan and Inventory Law of 1985 (Business Plan Act) requires that businesses that store hazardous materials onsite prepare a business plan and submit it to local health and fire departments. The business plan must include:

- Details of the facility and business conducted at the site;
- An inventory of hazardous materials that are handled and stored onsite;
- An emergency response plan; and
- A safety and emergency response training program for new employees with an annual refresher course.

Unified Hazardous Materials Management Regulatory Program

In January 1996, Cal EPA adopted regulations, which implemented a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program). The program has six elements: (1) hazardous waste generators and hazardous waste onsite treatment; (2) Underground Storage Tanks; (3) Aboveground Storage Tanks; (4) hazardous materials release response plans and inventories; (5) risk management and prevention programs; and (6) Unified Fire Code hazardous materials management plans and inventories. The plan is implemented at the local level and the agency responsible for implementation of the Unified Program is called the Certified Unified Program Agency (CUPA). In Fresno County, the Division of Environmental Health is the designated CUPA.

Fire Hazards

The California Uniform Fire Code and local building codes establish requirements for the construction and maintenance of structures for fire safety. The National Fire Protection Association (NFPA) develops and publishes consensus codes and standards intended to minimize the possibility and effects of fire and other risks. While not regulations, these codes and standards are industry-accepted guidelines for construction and fire protection systems. NFPA Code 820 establishes the standard for fire protection in waste water treatment and collection facilities, which would be applicable to dairy digester facilities. Additional relevant codes include a fuel gas code, standard on explosion prevention systems, standards for fire prevention during welding, etc.

The California Public Resources Code (PRC) includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that use an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas during the time of high fire danger to reduce the risk of wildland fires.

California Department of Forestry and Fire Protection

The California Department of Forestry and Fire Protection (CDF) has identified three types of wildland fire hazard severity zones: (1) Moderate; (2) High; and (3) Very High. Goals, objectives and prescriptions are given to reduce the potential risk of wildland fires, such as the use of spark arrestors, the use of defensible space and public education. The proposed project area lies within the City of Fresno and its SOI, which are located within local responsibility areas according to CDF, and are locally considered to be Urban Unzoned (CDF, 2007; CDF, 2009). These areas are described as being spatially removed from proximity to wildland fire areas.

Local

2025 Fresno General Plan

The City of Fresno 2025 General Plan Safety Element (City of Fresno, 2002) contains several objectives and policies relevant to hazardous materials.

Objective I-6 Reduce and control the adverse effects of hazardous materials on the public's health, safety, and welfare so as to promote the public health and welfare of local residents and the productive capacity of industry.

Policy I-6a Hazardous materials will be defined as those that, because of their quantity, concentration, physical or chemical characteristics, pose a significant potential hazard to human health, safety, or the environment. Specific federal, state, and local definition and listings of hazardous materials will be used by the City of Fresno.

Policy I-6b The city will coordinate and cooperate with other local, state, and federal agencies with expertise and responsibility for hazardous materials.

Policy I-6c Approval of annexations, and development projects (including issuance of building permits) will be subject to state and federal requirements for adequate assessment and mitigation measures on listed hazardous material sites and for business activities that involve more than threshold amounts of hazardous materials.

Policy I-6d As may be appropriate, the city shall require and evaluate the results of "Level I" and further site investigations before approving development entitlements on, or annexation of, property.

Policy I-6e Through the environmental review process for land use plans and other development projects, the city will continue to identify and assess the health-and safety-related implications of storage, use, and disposal of hazardous materials.

Policy I-6f All commercial and industrial special permits will be conditioned upon proper containment, use, safeguarding, and disposal of hazardous materials.

Policy I-6g The city will continue to prevent, assess, and seek remediation for, any hazardous material contamination within, and affecting, its planning area.

Policy I-6h The city will continue to aid in the identification and mapping of waste disposal sites (including abandoned wastes), and to assist in the survey of the kinds, amounts, locations, etc., of hazardous wastes.

Policy I-6i The city will utilize conditions for development projects, will adopt and enforce ordinances, and will use its police powers for land use regulation, code enforcement and nuisance abatement in order to

prohibit the inappropriate use of, and/or discharge of, toxic and hazardous materials to the atmosphere, to wastewater collection and storm drainage systems, to groundwater, and to surface bodies of water, when such use or discharge threatens public health, safety, or general welfare.

Policy I-6j Disaster and emergency response preparedness and planning for the city will include procedures and policies appropriate to hazardous materials.

Fresno County 2000 General Plan

The Health and Safety Element of the Fresno County 2000 General Plan contains the following goals and policies that are relevant to the proposed project.

Goal HS-B To minimize the risk of loss of life, injury, and damage to property and natural resources resulting from fire hazards.

Policy HS-B.8 **Fire Agency Review of Development Proposals:** The County shall refer development proposals in the unincorporated county to the appropriate local fire agencies for review of compliance with fire safety standards. If dual responsibility exists, both agencies shall review and comment relative to their area of responsibility. If standards are different or conflicting, the more stringent standards shall apply.

Policy HS-B.11 **Minimum Fire Flow Water Systems:** The County shall require new development to have water systems that meet County fire flow requirements. Where minimum fire flow is not available to meet County standards, alternate fire protection measures, including sprinkle systems, shall be identified and may be incorporated into development if approved by the appropriate fire protection agency.

Goal HS-E To minimize the exposure of the public to high noise levels and safety hazards through land use controls and policies for property in the vicinity of airports, and to limit urban encroachment around airports in order to preserve the safety of flight operations and the continued viability of airport facilities.

Policy HS-E.2 **Airport Safety Hazards:** The County shall ensure that new development, including public infrastructure projects, does not create safety hazards such as glare from direct or reflective sources, smoke, electrical interference, hazardous chemicals, or fuel storage in violation of adopted safety standards.

Policy HS-E.3 **Federal Airport Safety Zones:** The County shall ensure that development, including public infrastructure projects, within the airport approach and departure zones complies with Part 77 of the Federal Aviation Administration Regulations (Objects Affecting Navigable Airspace).

Goal HS-F To minimize the risk of loss of life, injury, serious illness, and damage to property resulting from the use, transport, treatment, and disposal of hazardous materials and hazardous wastes.

Policy HS-F.1	**Hazardous Materials Facilities:** The County shall require that facilities that handle hazardous materials or hazardous wastes be designed, constructed, and operated in accordance with applicable hazardous materials and waste management laws and regulations.
Policy HS-F.4	**Soil and Groundwater Contamination Reports:** For redevelopment or infill projects or where past site uses suggest environmental impairment, the County shall require that an investigation be performed to identify the potential for soil or groundwater contamination. In the event soil or groundwater contamination is identified or could be encountered during site development, the County shall require a plan that identifies potential risks and actions to mitigate those risks prior to, during, and after construction.

Fresno Yosemite International (Fresno Air Terminal) Land Use Policy Plan

The Fresno Yosemite International Land Use Policy Plan contains airport information, compatibility policies and criteria, compatibility zones and procedural policies for land use around the airport. The compatibility plan specifically provides for the orderly growth of the Fresno Yosemite International Airport and the surrounding area within the jurisdiction of the airport land use commission and safeguards the general welfare of the inhabitants within the vicinity of the airport and the public in general. The plan was adopted in 1986 and revised in 1990. Currently, an Airport Land Use Compatibility Plan is under development and a draft has been released.

Fresno Chandler Executive Airport Master and Environs Specific Plan

The Fresno Chandler Executive Airport Master and Environs Specific Plan contains information on airport area safety zones, noise contours and traffic patterns. The Master and Environs Specific Plan specifically promote compatibility between the Fresno Chandler Executive Airport and the land uses which surrounds it. The Master and Environs Specific Plan was adopted in 1999.

Sierra Sky Park Land Use Policy Plan

The Sierra Sky Park Land Use Policy Plan seeks to protect the public from the adverse effects of aircraft noise, to ensure that people and facilities are not located in areas incompatible with airport operations, and to ensure that no structures or activities adversely affect navigable airspace. The plan intends to safeguard the general welfare of its inhabitants within the vicinity of the airport and to ensure the continued operation of the airport for the planning future of Sierra Sky Park. The plan was adopted in 1985 and last revised in 1998.

Fresno County Operational Area Master Emergency Services Plan

The Fresno County Operational Area Master Emergency Services Plan serves as a guide for the County's response to emergencies/disasters in the unincorporated areas of the County. The purpose of this plan is to ensure the most effective and economical use of all resources, material and manpower, for the maximum benefit and protection of effected populations in an emergency/disaster. Its structure follows the Standardized Emergency Management System (SEMS). SEMS is a statewide organizational standard that allows ease of interaction between multiple agencies.

City of Fresno Emergency Response Plan

The City of Fresno Emergency Plan is a comprehensive plan to respond to emergency issues that might arise. The City's Police and Fire Departments are the lead agencies for all local emergency response efforts. Both departments have received specialized training to deal with terrorist threats and activities. In addition, the City's full-time Emergency Preparedness Officer (EPO) is responsible for ensuring that Fresno's emergency response plans are up-to-date and implemented properly. The EPO also facilitates cooperation between City departments and other local, state and federal agencies that would be involved in emergency response operations.

4.9.2 Impacts and Mitigation Measures

Methods of Analysis

The presence of hazardous materials in the project area was assessed through a database search of the CORTESE database. The impact analysis utilizes the information obtained through this database search to identify potential impacts associated with hazards and hazardous materials. The available data indicates that there are hazardous materials present within the potential areas of project construction; however the final determination as to whether hazardous materials are present may require onsite field investigations. Fire hazards were evaluated based on information available from CDF and fire management information available from the City. Potential effects on airport safety were evaluated based on project proximity to airport land use plans and FAA requirements.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area;
- For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or

- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Impacts and Mitigation Measures

Table 4.9-2 provides a summary of the impact analysis for issues related to hazards and hazardous materials.

TABLE 4.9-2
PROPOSED PROJECT IMPACT SUMMARY – HAZARDS AND HAZARDOUS MATERIALS

	Near-Term Project Elements		Future Project Elements	
Impact	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.9.1: Construction of proposed project facilities could result in the potential exposure of construction workers, the public and the environment to existing soil and/or groundwater contamination.	S	LS	S	LS
Impact 4.9.2: Construction and operation of proposed project facilities would involve the use, storage and transportation of hazardous materials which if released could result in a potential risk to the public and the environment.	LS	NA	LS	NA
Impact 4.9.3: Proposed project facilities could be located within one-quarter mile of a school resulting in potential hazards associated with accidental release of hazardous materials	LS	NA	LS	NA
Impact 4.9.4: Proposed project facilities could be located within two miles of an airport resulting in a safety hazard.	S	LS	S	LS
Impact 4.9.5: Installation of transmission pipelines in public rights-of-way could impair or physically interfere with an adopted emergency response plan or emergency evacuation plan.	S	LS	S	LS
Impact 4.9.6: Construction and operation of the proposed project could increase the risk of fire hazards.	LS	NA	LS	NA
Impact 4.9.7: Implementation of the proposed project could contribute to cumulative impacts associated with release of hazardous materials or other hazards.	LS	NA	LS	NA

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less than Significant Impact
NA = Not Applicable

Impact 4.9-1: Construction of proposed project facilities could result in the potential exposure of construction workers, the public and the environment to existing soil and/or groundwater contamination. (Significant)

Near-Term and Future Project Elements

Five Cortese sites are located within 500 feet of the proposed water transmission lines to be installed as part of the near-term project (Table 4.9-1) and a proposed future groundwater well. While the precise extent of contamination is not known, earth moving activities including grading and excavation associated with construction of both project elements could encounter known or previously unidentified contaminated soils and/or groundwater. This could result in the inadvertent release of hazardous materials exposing construction workers or the public to potential health hazards which is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by requiring site-specific investigations to identify existing soil and/or groundwater contamination, cleaning up any identified contamination, and siting facilities away from contaminated areas.

> **Measure 4.9.1a (NT/F):** Prior to final project design and any earth disturbing activities, the City shall conduct a Phase I Site Assessment. The Phase I Site Assessment shall be prepared by a Registered Environmental Assessor (REA) or equally qualified professional to assess the potential for contaminated soil or groundwater conditions at the project site and along conveyance alignments. The Phase I Site Assessment shall include a review of appropriate federal and State hazardous materials databases, as well as relevant local hazardous material site databases for hazardous waste on-site and off-site locations within a one quarter mile radius of the project site and along conveyance alignments. The Phase I Site Assessment shall also include a review of existing or past land uses and aerial photographs, summary of results of reconnaissance site visit(s), and review of other relevant existing information that could identify the potential existence of contaminated soil or groundwater.
>
> If no contaminated soil or groundwater is identified or if the Phase I Site Assessment does not recommend any further investigation then the City shall proceed with final project design and construction.
>
> **Measure 4.9.1b (NT/F):** If existing soil or groundwater contamination is identified and if the Phase 1 Site Assessment recommends further review, the City shall retain a REA to conduct follow-up sampling to characterize the contamination and to identify any required remediation that shall be conducted consistent with applicable regulations prior to any earth disturbing activities. The environmental professional shall prepare a report that includes, but is not limited to, activities performed for the assessment, summary of anticipated contaminants and contaminant concentrations at the proposed construction site, and recommendations for appropriate handling of any contaminated materials during construction.
>
> **Measure 4.9.1c (NT/F):** If unidentified or suspected contaminated soil or groundwater is encountered during construction activities, work shall be halted in the area of potential exposure, and the type and extent of contamination shall be identified by a REA. The environmental professional shall prepare a report that includes, but is not limited to, activities

performed for the assessment, summary of anticipated contaminants and contaminant concentrations at the proposed construction site, and recommendations for appropriate handling of any contaminated materials during construction.

Measure 4.9.1d (F): Groundwater wells and recharge basins shall be located at least 1,000 feet from any area that is listed and verified as a hazardous materials site on LUST, SLIC, Cortese, or other relevant databases.

Significance After Mitigation: Less than Significant

Impact 4.9.2: Construction and operation of proposed project facilities would involve the use, storage and transportation of hazardous materials which if released could result in a potential risk to the public and the environment. (Less than Significant)

Near-Term and Future Project Elements

Construction activities would likely require use of limited quantities of hazardous materials such as fuels for construction equipment, oils, and lubricants. The types and quantities of hazardous materials would vary at each proposed project construction site depending on the facility. The improper use, storage, handling, transport or disposal of hazardous materials could result in accidental release of hazardous materials, thereby exposing construction workers, the public and the environment, including soil and/or ground or surface water, to hazardous materials contamination.

Operation of the proposed SWTFs would involve increased transport, use, and storage of hazardous materials in comparison to existing conditions. Specifically, operation of the SE SWTF would involve the use chemicals during the water treatment process. As shown in Table 3-3 of Chapter 3, these chemicals include alum, various polymers, activated carbon, sodium hypochlorite, citric acid, and sodium bisulfate. The existing NE SWTF and other future SWTFs would also use similar chemicals. Other hazardous materials that would be present at SWTFs would include fuels, oils, greases, paints, and other chemicals needed for facility and equipment use, upkeep, and maintenance. Under normal operating procedures, all chemicals would either be contained on site or consumed within the water treatment process and/or normal operations. However, unanticipated, accidental release of these hazardous materials into the environment could result in degradation of the environment, or increased risk of contact with hazardous materials among facility employees and the general public.

As discussed in the regulatory setting, numerous laws and regulations govern the transport, use, storage, handling and disposal of hazardous materials to reduce the potential hazards associated with these activities. Cal/OSHA is responsible for developing and enforcing workplace safety standards, including the handling and use of hazardous materials. Transportation of hazardous materials is regulated by the DOT and Caltrans. Together, federal and State agencies determine driver-training requirements, load labeling procedures, and container specifications designed to minimize the risk of accidental release.

As described in Section 4.4, the federal CWA prohibits discharges of stormwater from construction projects unless the discharge is in compliance with an NPDES permit. The State Water Board is the permitting authority in California and has adopted a Statewide General Permit for Stormwater Discharges Associated with Construction Activity (Construction General Permit, Order No. 99-08) that encompasses one or more acres of soil disturbance. The permit requires, among other actions, implementation of mandatory BMPs including, implementation of pollution/sediment/spill control plans, training, sampling and monitoring for non-visible pollutants

Because numerous laws and regulations govern the transport, use, storage, handling and disposal of hazardous materials to reduce the potential hazards associated with these activities this impact would be less than significant.

Mitigation (NT/F): None required.

Impact 4.9.3: Proposed project facilities could be located within one-quarter mile of a school resulting in potential hazards associated with accidental release of hazardous materials (Less than Significant)

Near-Term and Future Project Elements

There are numerous Fresno area schools within one quarter mile of proposed near-term project elements (see Section 4.10, Public Services and Utilities). The proposed SE SWTF would be located approximately 0.2 mile from Temperance-Kutner Elementary School and the proposed NE SWTF upgrades would be located approximately 0.2 mile from Riverview Elementary School. Future SWTFs could also be sited within one-quarter mile of a school.

As discussed under Impact 4.9.2, operation of proposed SWTFs would involve increased transport, use, and storage of hazardous materials in comparison to existing conditions. Under normal operating procedures, all chemicals would either be contained on site or consumed within the water treatment process and/or normal operations. However, unanticipated, accidental release of these hazardous materials into the environment could occur. Chemicals used in support of the water treatment process would not include gaseous chemicals or vapors (they would be liquids or solids) and, therefore, when released would not be anticipated to travel off site and potentially pose a risk to nearby schools. Furthermore, as described under Impact 4.9.2, there are numerous laws and regulations governing the transport, use, storage, handling and disposal of hazardous materials to minimize potential release and the associated risks.

Because the type of materials associated with the SWTFs would not involve chemicals that would likely migrate off the project site, and because there are numerous laws and regulations govern hazardous materials this impact would be less than significant.

Mitigation (NT/F): None required.

Impact 4.9.4: Proposed project facilities could be located within two miles of an airport resulting in a safety hazard. (Significant)

Near-Term and Future Project Elements

The proposed SE SWTF would be located approximately 1.5 miles southeast of the Fresno-Yosemite International Airport. According to the 2012 Fresno Yosemite International Airport Land Use Compatibility Plan (ALUCP; City of Fresno, 2012), a portion of the SE SWTF would be located within the Outer Approach/Departure Zone (Safety Zone 4) and the Traffic Pattern Zone (Safety Zone 6) of the airport's primary runway. According to CFR Title 14 Part 77.23, air space obstructions include structures (as applicable to the project) that would be one of the following: more than 500 feet above ground level; above 200 feet above ground level or above the established airport elevation (whichever is greater) within 3 nautical miles of an airport; that would reach a height that would increase minimum obstacle clearance altitudes; or greater than 150 feet above the established airport elevation pursuant to 14 CFR 77.25. The proposed SE SWTF would include structures and an approximately 100-foot tall radio tower within this area, which would not be classified as an air space obstruction, including for height restrictions in Safety Zones 4 and 6. Also, buildings, water tanks, and other structures under the proposed project would not be built to a height that would interfere with airport operations.

Future project elements include construction of above ground storage tanks could be located approximately 0.6 mile northwest of the Fresno-Yosemite International Airport (within the Inner Turning Zone of the airport, Safety Zone 3), and 1.8 miles southwest of the airport (within the Outer Approach/Departure Zone and the Traffic Pattern Zone of the airport, Safety Zones 4 and 6).

The SE SWTF also includes settling ponds and solids drying beds to decant and recycle water and to remove solids. The ponds would be managed so that they would not hold water for long periods. In addition, groundwater recharge facilities proposed to be developed under future project elements could also involve surface water storage. Depending on the length of time water is stored, proposed project ponds and recharge facilities could attract waterfowl which could increase the potential for birdstrikes posing a safety threat to airplanes during takeoff and landing at local airports.

The FAA's Advisory Circular on Hazardous Wildlife Attractants on or Near Airports (AC No. 150/5200-33B) provides various guidelines for the siting of certain land uses near public use airports. Adherence to FAA wildlife hazards requirements is implemented through grant assurances to which the City is subject. These include assurances for: (1) hazard removal and mitigation within airspace needed to protect visual and instrument operations; and (2) City implementation of appropriate planning actions to ensure that land uses located near a public airport would not reduce compatibility with that airport.

Lighting would be installed at the proposed new SE SWTF and future SW SWTF. Exterior emergency night lighting would be installed around other proposed project facilities including water tanks and pump stations. Potential impacts of night lighting are addressed in Section 4.11, Aesthetics.

Proposed facilities are not anticipated to physically interfere with airport flight paths or airport operations; however, the location of facilities that would hold surface water in proximity to local airports could increase potential risks associated with birdstrikes and this is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by ensuring that all facilities proposed within two miles of an airport adhere to lighting and height restrictions identified in the applicable ALUCP, and by requiring the siting of surface water sources consistent with FAA requirements.

> **Measure 4.9.4a (NT/F). P**roposed facilities located within two miles of a public use airport shall incorporate height and lighting restrictions identified in the applicable ALUCP. Construction equipment used to build structures and the structures themselves shall be limited in height in accordance with the Code of Federal Regulations.
>
> **Measure 4.9.4b (NT/F).** Surface water features (settling basins, groundwater recharge facilities, etc.) associated with proposed project facilities shall be sited consistent with the guidance contained in the Federal Aviation Administration Advisory Circular 150/520-33b Hazardous Wildlife Attractants on or Near Airports, as applicable.
>
> **Significance After Mitigation**: Less than Significant

Impact 4.9.5: Installation of transmission pipelines in public rights-of-way could impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. (Significant)

Near-Term and Future Project Elements

Pipeline installation would occur in and across streets. The location of the proposed pipelines within the roadways would be dependent on existing utilities under the roadway, and would be identified during the design phase of the project.

Existing transportation and circulation patterns in the vicinity of the proposed pipeline alignments would be temporarily disrupted by construction activities and heavy equipment use. Impacts related to this project component would include direct disruption of traffic flows and street operations. Lane blockages or street closures during pipeline installation would result in a reduction in travel lanes and curb parking, and could result in the need for traffic re-routing. As a result, installation of the proposed pipelines could impair or physically interfere with adopted emergency response plans or emergency evacuation plans. This is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by requiring that the City coordinate with the appropriate local government departments regarding the timing of construction activities. In addition, project contractors

would be required to obtain roadway encroachment permits and to develop and implement traffic control plans.

Measure 4.9.5 (NT/F): Implement Measure 4.6.1.

Significance After Mitigation: Less than Significant

Impact 4.9.6: Construction and operation of the proposed project could increase the risk of fire hazards. (Less than Significant)

Near-Term and Future Project Elements

Although the majority of the proposed project area is located in urban areas where the risk of wildland fire is considered to be low, some vegetation could still be present in construction and/or staging areas. Construction equipment and vehicles used for construction of facilities associated with the proposed project could come into contact with vegetated areas within the project area, potentially igniting dry vegetation and resulting in fire.

As stated in the regulatory setting discussion, the PRC includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that use an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas during the time of high fire danger to reduce the risk of wildland fires.

Components of the proposed project that require electricity shall be built to current codes requiring that wiring standards avoid potentially hazardous or fire causing conditions. Additionally, standard fire prevention and suppression measures, such as flame-resistant roof tiles and clearing of vegetation around structures as per local requirements, would be incorporated into project design and operations management to reduce the risk of fire.

Because numerous laws and regulations govern the transport, use, storage, handling and disposal of hazardous materials to reduce the potential hazards associated with these activities, this impact would be less than significant.

Mitigation (NT/F): None required.

The cumulative context for hazards and hazardous materials is projects that could result in an increased risk of exposure due to the release of hazardous materials in the City's SOI and Fresno County.

Impact 4.9.7: Implementation of the proposed project could contribute to cumulative impacts associated with release of hazardous materials or other hazards. (Less than Significant)

Near-Term and Future Project Elements

The potential for cumulative projects to result in a release resulting in an increased risk of exposure and the project's contribution would be limited. Exposure to existing soil and groundwater contamination is generally site-specific and depends on past, present, and future uses and existing soil, sediment, and groundwater conditions. Any hazardous materials uncovered during construction activities would be managed consistent with applicable federal, State and local laws to limit exposure and clean up the contamination. In addition, the storage, handling and transport of hazardous materials are also regulated by federal, State and local regulatory agencies to limit risk of exposure.

The contribution of the project to cumulative risk of exposure would not be considerable. While construction and operational activities could result in accidental spills or leaks in the vicinity, the extent of the contamination is not likely to extend beyond the project site boundaries due to the type and limited quantities of hazardous materials likely to be used (for example, motor fuels, hydraulic oils, paint, and lubricants). Furthermore, as identified above, all proposed project activities associated with the use, storage and transportation of hazardous materials would be required to adhere to all applicable laws and regulations. In summary, the construction and operation of the project in combination with other projects would not create a significant hazard to the public or the environment through the routine transport, use, disposal or accidental release of hazardous materials due to the site-specific nature of the potential impacts and existing laws and regulations that minimize the risk of exposure. Therefore, this is considered a less-than-significant cumulative impact.

Mitigation (NT/F): None required.

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4.10 Public Services and Utilities

This section provides a discussion of the public services and utilities in the project area that may be affected by implementing the proposed project. Issues associated with police and fire protection services, parks, schools, wastewater treatment, water supply, and solid waste disposal are discussed. Potential impacts addressed include construction-related disturbance to existing service utility infrastructure that could be located within or adjacent to construction areas. Impacts associated with drainage system capacity are addressed in Section 4.4, Hydrology and Water Quality.

No comments addressing public services or utilities were received in response to the NOP (see Appendix B).

4.10.1 Environmental Setting

The proposed project area is served by city, county and state service providers, as described below.

Police Protection

The Fresno City Police Department is responsible for providing police protection within the City limits. Services offered to the project area include uniformed patrol response to calls for service, crime prevention, tactical crime enforcement, and traffic enforcement/accident prevention (City of Fresno, 2002).

The Fresno County Sheriff's Department provides similar law enforcement services for the unincorporated areas of the project area. California State University, Fresno is served by its own campus police department.

The CHP service area is along the State and Interstate highway system that dissects the plan area. The CHP collaborates with both county and city police departments when the need arises.

Fire Protection and Emergency Medical Services

The Fresno Fire Department offers fire prevention, fire suppression, hazardous material mitigation, rescue, and emergency medical care services within city limits. There are 23 fire stations within the Fresno city limits, plus an air rescue terminal (City of Fresno, 2013).

The City has an automatic aid agreement with the Fresno County Fire Department Protection District and the North Central Fire Protection District in which the nearest fire station responds to an emergency regardless of the jurisdiction within which it is located; however, this agreement does not include emergency medical services. The City also has an automatic aid agreement with the City of Clovis which include both fire and first responder emergency medical services. The City has mutual aid agreements with surrounding fire jurisdictions that allow for multi-jurisdictional response for disasters or fires of great magnitude (Fresno County, 2000).

The Fresno Fire Department also provides first responder emergency medical service for all City residents; however, advanced life support (paramedic) and emergency transport are not provided by the Fresno Fire Department. Emergency transport within the City of Fresno is provided by an exclusive private contractor. Fresno County along with the medical community establishes the criteria for the delivery of advanced life support and emergency medical service (City of Fresno, 2002).

Parks and Recreation

City parks, private golf courses, San Joaquin River Conservancy open spaces and other recreational facilities and properties are found throughout the proposed project area. The City owns and operates nearly 75 parks ranging in size from regional parks like the 300-acre Woodward Park and the 110-acre Regional Sports Complex, to small and numerous neighborhood pocket parks. Numerous stormwater basins and groundwater basins, owned and operated by the City, FID and FMFCD throughout the metropolitan area provide some recreational opportunities, such as soccer fields, when not scheduled to hold stormwater during the rainy season.

Schools

Schools and other educational facilities and properties are found throughout the proposed project area. Public school districts located within the proposed project area include the following eight districts:

- Central Unified
- Clovis Unified
- Fowler Unified
- Fresno Unified
- Orange Center
- Sanger Unified
- West Fresno
- West Park

Solid Waste

The City of Fresno provides for solid waste pickup from residences and commercial and industrial uses within City limits. The Fresno metropolitan area is served by several landfills including the Orange Avenue Landfill, American Avenue Disposal Site and the City of Clovis Landfill. Solids from the NE SWTF have typically gone to the Orange Avenue Landfill. The American Avenue Landfill is owned and operated by Fresno County and is currently permitted to be open through August, 2031. It has a remaining capacity of 29,358,535 cubic yards and a max permitted throughput of 2,200 tons per day (CalRecycle, 2013a). The City of Clovis Landfill is owned and operated by the City of Clovis, and is permitted through August 2017, when the permit will be reviewed by CalRecycle. The City of Clovis Landfill has a remaining capacity of 7,740,000 cubic yards and a max permitted throughput of 2,000 tons per day (CalRecycle, 2013b). Negotiations are currently underway with the American Avenue Landfill and solid waste generated by proposed project facilities

would be disposed of at one of these regional facilities located in or around Fresno County. Governmental agencies such as school districts, State and local governments, contract with private haulers for the collection of agency, residential, commercial and other solid waste. Private haulers serve the incorporated parcels within the Fresno metropolitan area.

Wastewater

Wastewater treatment, collection and disposal in the proposed project area is provided by the City of Fresno. The City owns and operates the Fresno-Clovis RWRF near Jensen and Cornelia Avenues in southwestern Fresno, which receives average dry weather flows (ADWF) of approximately 72.68 mgd and has a treatment capacity of 80 mgd (City of Fresno, 2009). The City of Clovis has purchased capacity in the trunk sewers and treatment capacity at the wastewater reclamation facility through a joint powers agreement. The regional collection system primarily uses gravity, but some pumping facilities and lift stations are used in the area based on local topography. Rural residential and agricultural properties in unincorporated areas of the proposed project area rely on septic tanks and leach fields. Following secondary treatment, wastewater is distributed to a series of infiltration ponds where it is allowed to percolate. The proposed sites for the SE and SW SWTFs are both located adjacent to sewer lines operated by the City of Fresno. The SE SWTF would be served by a large (greater than 33 inches) sewer line that runs north-to-south along Fowler Avenue. Similarly, the proposed SW SWTF facility would be located adjacent to a large (greater than 33 inches) sewer line that runs north-to-south along Marks Avenue (City of Fresno, 2009).

Water Supply

The City of Fresno Water Division serves an estimated population of 514,090 (as of January 1, 2013) located in the City limits and SOI. In 2012, the City met water demand by using 86 percent groundwater and 14 percent treated surface water. The City currently operates approximately 270 municipal supply wells, and until late 2004, relied solely on pumped groundwater to meet water demands within its service area.

The City of Fresno currently has three sources of surface water supplies:

- A contract with FID for a portion of FID's water entitlement from the Kings River;
- A USBR contract; and
- The City's Wastewater Recycle Exchange Agreement with FID.

Some of these available surface water supplies are treated at the City's existing NE SWTF and some are used for intentional groundwater recharge. Please see Chapter 2, Project Background for a more detailed discussion of the City's supply sources. Table 4.10-1 presents existing and future surface water supplies available during normal years.

TABLE 4.10-1
EXISTING AND FUTURE SURFACE WATER SUPPLIES PROJECTED TO BE AVAILABLE DURING NORMAL YEARS (AF)

Surface Water Supply	2015	2020	2025
FID Kings River	105,400	115,900	126,500
USBR	58,200	58,200	58,200
Recharge/Exchange Water	13,800	13,800	13,800
Total Surface Water Supply in Normal Years	**177,400**	**187,900**	**198,500**
Planned Future Surface Water Treatment Capacity [a, b]	**30,800**	**123,400**	**123,400**

a. The existing treatment capacity for the NE SWTF is 30 mgd (30,800 af/yr).
b. Planned future treatment capacity includes: constructing a new 80 million gallons per day (mgd) Southeast (SE) SWTF to be located in the southeast portion of the City beginning in spring of 2015 and completed by winter 2018; and expanding the existing NE SWTF from 30 mgd to 60 mgd about 2020. The proposed new Southwest (SW) SWTF is not included as it is anticipated to be constructed sometime after 2025. Annual treatment capacity assumes that the SWTFs are out of service for one month of the year for maintenance activities.

Water is supplied to the City through a network of water supply wells and distribution mains.

Gas and Electric Service

The proposed project area is primarily served by PG&E for natural gas and electric service. An extensive network of high-and low-voltage electrical lines and substations and natural gas mains and related facilities are used to supply service. PG&E has set minimum right-of-way standards, depending on the voltage of transmission lines. The higher the voltage, the greater the right-of-way required.

Regulatory Setting

State

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates privately owned telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation companies, in addition to authorizing video franchises. The CPUC establishes service standards and safety rules and authorizes utility rate changes

Integrated Waste Management Act of 1989 (Assembly Bill 939)

The California Integrated Waste Management Act of 1989 requires state, county and local governments to divert at least 50% of their solid waste from their landfills by the year 2000. The Act is overseen by the CalRecycle, formerly California Integrated Waste Management Board (CIWMB). CalRecycle oversees a reporting program for local jurisdictions to account for levels of diversion achieved. Implementation is often carried out by a local entity called a Local Enforcement Agency (LEA). The LEA for the Study Area is Fresno County.

Local

2025 Fresno General Plan

The City of Fresno 2025 General Plan Public Facilities Element includes relevant policies pertaining to public services, utilities, and public service systems.

Energy Conservation

Objective G-9 Reduce the consumption of non-renewable energy resources by requiring and encouraging conservation measures and the use of alternative energy sources

Policy G-9a The City shall continue its leadership role in conservation through its own facilities and operations.

- The city shall continue its existing and beneficial energy conservation programs.
- All new construction and major renovations in municipal buildings shall conform to applicable Title 24 energy standards.

Police Services

Objective E-24 Provide the level of law enforcement and crime prevention services necessary to maintain a safe, secure, and stable urban living environment through a police department that is dedicated to providing professional, ethical, efficient and innovative service with integrity, consistency and pride.

Fire Services

Objective E-26 Ensure that the Fire Department's staffing and equipment resources are sufficient to implement all requests for fire and emergency service from the citizens of Fresno.

Policy E-26b Provide for an average response time of not more than five minutes for all emergency requests for service within the metropolitan area.

Schools

Objective E-28 Cooperate with and encourage all school districts within the metropolitan area to provide the educational facilities and programs necessary to meet the needs of the area's students.

Objective E-28 Cooperate with and encourage all school districts within the metropolitan area to provide the educational facilities and programs necessary to meet the needs of the area's student population.

Solid Waste and Community Sanitation

Objective E-30 Provide adequate solid waste facilities and services for the collection, transfer, recycling, and disposal of refuse.

Sewer

Objective E-20 Ensure the provision of adequate sewage treatment and disposal by utilizing the Fresno-Clovis Regional Wastewater Treatment and Reclamation Facility as the primary facility, when economically feasible, for all existing and new development within the metropolitan area.

Policy E-20b Continue to implement cost efficient and environmentally beneficial operational and management measures to maximize plant effectiveness.

Objective E-21 Promote reduction in wastewater flows and develop facilities for beneficial reuse of reclaimed water and biosolids for management and distribution of treated wastewater.

Policy E-20b Implement conservation and other programs and policies to reduce wastewater flows.

Water

Objective E-22 Manage and develop the City of Fresno's water facilities to ensure a safe, economical, and reliable water supply for existing and planned urban development and economic diversification.

Policy E-22f New development and connections to the City's water supply and distribution system shall pay for the cost of being attached to the water system through connection fees and for the cost that they place on the entire water system including treatment, production, distribution, recharge and conservation and/or provide for the installation of public facilities and participate in capital improvement financing programs necessary to accommodate new development, consistent with economic diversification strategies.

City of Fresno Emergency Response Plan

The City of Fresno emergency plan is a comprehensive plan to respond to emergency issues that might arise. The City's Police and Fire Departments are the lead agencies for all local emergency response efforts. Both departments have received specialized training to deal with terrorist threats and activities. In addition, the City's full-time EPO is responsible for ensuring that Fresno's emergency response plans are up-to-date and implemented properly. The EPO also facilitates cooperation between City departments and other local, state and federal agencies that would be involved in emergency response operations.

Fresno County General Plan

Portions of the proposed project, specifically the proposed Conveyance Options to the new SE SWTF, would traverse through portions of unincorporated Fresno County; however, there are not applicable policies that would apply to these project elements.

Fresno County Operational Area Master Emergency Services Plan

The Fresno County Operational Area Master Emergency Services Plan serves as a guide for the County's response to emergencies/disasters in the unincorporated areas of the County. The purpose of this plan is to ensure the most effective and economical use of all resources, material and manpower, for the maximum benefit and protection of effected populations in an emergency/disaster. Its structure follows the SEMS. SEMS is a statewide organizational standard that allows ease of interaction between multiple agencies.

4.10.2 Impacts and Mitigation Measures

Methods of Analysis

Construction-related impacts on public services and utilities are evaluated using a qualitative assessment using existing information to determine if construction and operation of proposed project facilities would reduce levels of service or disrupt service and delivery of utility infrastructure.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Generate need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any public services (i.e., fire protection, police protection, schools, parks, other public facilities, the construction of which could cause significant environmental impacts);
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill without sufficient permitted capacity to accommodate the project's solid waste disposal needs; and
- Comply with federal, state, and local statutes and regulations related to solid waste.

Impacts to drainage infrastructure capacity are addressed in Section 4.4, Hydrology and Water Quality.

Impacts and Mitigation Measures

Table 4.10-2 provides a summary of the impact analysis for issues related to public services and utilities.

TABLE 4.10-2
PROPOSED PROJECT IMPACT SUMMARY – PUBLIC SERVICES AND UTILITIES/SERVICE SYSTEMS

	Near-Term Project Elements		Future Project Elements	
Impact	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.10.1: The proposed project could increase demands for public services.	LS	NA	LS	NA
Impact 4.10.2: The proposed project could generate solid waste that would be disposed of at a landfill without sufficient permitted capacity or violate statutes and regulations related to solid waste.	LS	NA	LS	NA
Impact 4.10.3: Implementation of the proposed project would increase demand for water supply and treatment.	LS	NA	LS	NA
Impact 4.10.4: Implementation of the proposed project would increase demand for wastewater treatment.	LS	NA	LS	NA
Impact 4.10.5: Implementation of the proposed project could increase energy demand.	LS	NA	LS	NA
Impact 4.10.6: Construction of the proposed project could result in temporary interference or disruption of utility service.	S	LS	S	LS
Impact 4.10.7: Implementation of the proposed project, in combination with other projects, could cumulative increase demands public services and utilities.	LS	NA	LS	NA
Impact 4.10.8: Construction of the proposed project, in combination with other projects, could result in temporary interference or disruption of utility service.	S	LS	S	LS

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less-than-significant Impact
NA = Not Applicable

Impact 4.10.1: The proposed project could increase demands for public services. (Less than Significant)

Near-Term and Future Project Elements

The proposed project would involve the relocation of existing City Water Division administrative and corporation yard uses to the new SE SWTF, and the operation of that facility along with the proposed new SW SWTF (future project element). The proposed project also would include modifications to the existing NE SWTF and other facilities (storage tanks, groundwater facilities, etc.) which could result in a minimal increase in demand for police, fire and emergency response services; however, it is not anticipated that this increase would alter the demand for these services

substantially over that which currently exists. Furthermore, the proposed Metro Plan Update would not involve development of new residential, commercial or industrial land uses. Furthermore, employees at the new and expanded SWTF are anticipated to come from the local employment pool; therefore, the proposed project would not directly or indirectly result in population growth or development that would require additional public services including police and fire protection, parks, and schools. As a result, the proposed project would not affect existing public service ratios resulting in the need for new or expanded facilities and this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

Impact 4.10.2: The proposed project could generate solid waste that would be disposed of at a landfill without sufficient permitted capacity or violate statutes and regulations related to solid waste. (Less than Significant)

Near-Term and Future Project Elements

Construction of the proposed project would generate solid waste, including a variety of building materials that could be recycled, paper products, metals, plastics and other building materials, as well as some waste associated with leftover fill. State regulations related to solid waste require construction and demolition debris generated on a jobsite to be reused, recycled, or otherwise diverted. Contractors hauling waste to County transfer stations or landfills would be required to demonstrate an effort to reuse, recycle, and divert construction debris to the greatest extent practical prior to loads being accepted at the facility in accordance with City Ordinance (Section 6-205(f)). The project would incorporate activities and other requirements in order to minimize environmental impacts of solid waste generation, transport and disposal in order to meet requirements of California Integrated Waste Management Act of 1989 (AB 939). Specifically, city construction contracts include recycling provisions that require that no recycled materials be disposed of at a landfill and that all disposable recyclable materials are to be disposed of in a manner that facilitates recycling. Contractors are also required to provide a certificate of compliance stating the disposal location and manner of disposal of recyclable materials. Furthermore, contractors are required to report quantities of disposed materials in a manner that enables the City to use diverted quantities as diversion credits.

Proposed new and expanded SWTFs would include generation of solid waste associated with operations. Specifically, the proposed new SE SWTF includes the relocation of City of Fresno administrative and corporation yard uses along with new and relocated employees who would be engaged in the daily operation of the facility. Types of operational solid waste assumed to be generated by the proposed project include paper and cardboard materials, food waste, and office supplies (e.g., fluorescent light bulbs, toner cartridges, batteries, etc.). Universal wastes, such as light bulbs, toner cartridges, batteries, and various types of electronic equipment shall be recycled per requirements set forth by the Fresno County Environmental Health Department. The amount of solid waste generated by the relocated administrative and corporation yard uses would be similar to the amount generated under existing conditions.

As discussed in the setting, the Fresno metropolitan area is served by several landfills including the Orange Avenue Landfill, American Avenue Disposal Site and the City of Clovis Landfill. Each of these has permitted capacity. Negotiations are currently underway with the American Avenue Landfill and solid waste generated by the construction and operation of proposed project facilities would be disposed of at one of these regional facilities with permitted capacity located in or around Fresno County. In addition, solid waste would be managed consistent with the requirements of AB 939 and the City's recycling ordinance; therefore, the project would not exceed landfill capacity or violate any applicable solid waste statutes or regulations and this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

Impact 4.10.3: Implementation of the proposed project would increase demand for water supply and treatment. (Less than Significant)

Near-Term and Future Project Elements

As described under Impact 4.10.1, the proposed Metro Plan Update would not involve development of new residential, commercial or industrial land uses; therefore, the proposed project would not directly or indirectly result in population growth or development that would require additional water supply or water treatment demand.

The proposed project would include operation of new and expanded SWTFs which would result in an increase demand for water and water treatment. The proposed new SE SWTF would include the relocation of existing administrative and corporation yard uses. Water supply would be needed to support administrative and corporation yard uses (restrooms, kitchens, vehicle wash area) and site landscaping. However, because the administrative and corporation yard are existing operating facilities, the demand for water at the new SE SWTF would not be anticipated to be substantially more than current demand.

The proposed expansion of the NE SWTF would require minimal increase in water demand over current conditions because the expansion is primarily of treatment processes and would not include additional support uses, such as administrative uses or landscaping. The proposed SW SWTF would be anticipated to result in an increase in water demand similar to the NE SWTF because it would also not include the administrative and corporation yard uses proposed at the SE SWTF. Other project components, such as transmission pipelines, pumps, and water storage facilities would not increase water demand.

Given that the proposed project would not significantly increase demand for water and water treatment beyond that which already exists, it would not be anticipated to exceed existing treatment capacity and this is considered a less-than-significant impact. Furthermore, the purpose of the City's Metro Plan Update is to provide sustainable and reliable water supplies to meet the demand of existing and future customers through 2025, including the proposed project facilities, through the construction and operation of new and modified surface water treatment and storage

facilities, transmission pipelines, groundwater facilities, recycled water facilities and water conservation measures. Therefore, no new water supply entitlements would be required.

Mitigation (NT/F): None required.

Impact 4.10.4: Implementation of the proposed project would increase demand for wastewater treatment. (Less than Significant)

Near-Term and Future Project Elements

As described under Impact 4.10.1, the proposed Metro Plan Update would not involve development of new residential, commercial or industrial land uses; therefore, the proposed project would not directly or indirectly result in population growth or development that would require additional wastewater treatment demand.

The proposed project would include operation of new and expanded SWTFs which would result in an increase demand for wastewater treatment. The proposed new SE SWTF would include the relocation of existing administrative and corporation yard uses. Employees working at the relocated administrative building and corporation yard would be existing City employees moved to the proposed SE SWTF site; therefore, the amount of new wastewater flows would be similar to existing conditions. Up to 15 new facility staff would be required to operate the SE SWTF. Wastewater generated by on-site uses at the SWTFs would be conveyed through the City's sewer system to the RWRF, which receives ADWF of approximately 72.68 mgd (City of Fresno, 2009). Given the low number of new employees that would work at the proposed SWTFs, and the fact that the majority of employees at the SE SWTF would be existing city employees relocated to the facility, it is anticipated that the proposed SWTFs would not generate wastewater flow in an amount that would exceed the RWRF's treatment capacity of 80 mgd.

The proposed expansion of the NE SWTF would require minimal increase in demand for wastewater treatment over current conditions because the expansion is primarily of treatment processes and would not include additional support uses, such as administrative uses. The proposed SW SWTF would be anticipated to result in an increase in wastewater treatment demand similar to the NE SWTF because it would also not include the administrative and corporation yard uses proposed at the SE SWTF. Other project components, such as transmission pipelines, pumps, and water storage facilities would not increase wastewater treatment demand.

Given that the proposed project would not significantly increase wastewater generation, it would not be anticipated to exceed existing RWRF capacity and this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

Impact 4.10.5: Implementation of the proposed project could increase energy demand. (Less than Significant)

Near-Term and Future Project Elements

The proposed project area is primarily served by PG&E for natural gas and electric service. Development of proposed SWTFs would result in an increase in energy demand associated with the operation of pumps, motors, and other equipment, office lighting and environment control, automatic gates, and outdoor security lights. The relocation of administrative and corporation yard uses to the new SE SWTF would result in similar energy demand compared to existing conditions. Proposed new facilities would be designed in conformance with Title 24 energy standards. Furthermore, the SE SWTF includes the use of on-site renewable power sources. PV panels would generate approximately two MW of power to offset the average energy use by proposed pretreatment, ozone generation, filtration, chemical addition, and dewatering processes as well as the offices and other administrative uses. Renewable energy would also be generated on site through the use of a hydroturbine to be located at the raw water pipeline. While the capacity and sizing would be dependent on the head available and the flow rate through the turbine, preliminary sizing indicates a propeller turbine could be installed to generate approximately 125 kW of power.

Because proposed project facilities would be constructed to adhere to Title 24 energy standards and renewable energy sources would be developed and used to offset energy demand at the SE SWTF, it is not anticipated that proposed project facilities would result in a demand substantially over that which currently exists. Therefore, the proposed project would not result in the need for new or expanded facilities and this is considered a less-than-significant impact.

Mitigation (NT/F): None required.

Impact 4.10.6: Construction of the proposed project could result in temporary interference or disruption of utility service. (Significant)

Near-Term and Future Project Elements

Installation of pipelines and other facilities associated with the proposed project could result in the short term disruption of utility services if construction occurs in or adjacent to existing utility infrastructure easements, including underground electricity, gas, telephone, and cable television lines. Even though any disruptions would be anticipated to be temporary this is considered to be a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level by ensuring there would be no disruption of existing utility service.

Measure 4.10.6 (NT/F): Prior to construction of individual projects, the City shall prepare and implement a Utility Avoidance Plan. The plan would ensure that individual project specifications contain a detailed engineering and construction plan to avoid utility conflicts. Measures to avoid utility conflicts include but might not be limited to:

- Verification of utility locations through field survey and use of the Underground Service Alert (USA).
- Specifications prepared as part of the design plans that include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utilities shall be notified of construction plans and schedule. Arrangements may be made with these entities regarding protection, relocation, or temporary disconnection of services.
- Notification of residents and businesses in the proposed project construction area of any planned utility service disruption two to four days in advance, in conformance with City, County and state standards.
- Reconnection of any disconnected cables and lines as soon as possible.

Significance After Mitigation: Less than Significant

The cumulative context would be the service areas of the various service and utility providers.

Impact 4.10.7: Implementation of the proposed project, in combination with other projects, could cumulative increase demands public services and utilities. (Less than Significant)

Near-Term and Future Project Elements

Cumulative development within the City of Fresno could result in an increased demand for public services and utilities which could result in reduced levels of service and/or infrastructure and treatment capacity. As described under Impact 4.10.1, the proposed Metro Plan Update would not involve development of new residential, commercial or industrial land uses; therefore, the proposed project would not directly or indirectly result in population growth or development that would contribute to the need for additional public services or utilities.

Development and operation of new and upgraded SWTFs facilities could result in a minimal need for service and utility demand. However, it is not anticipated that this increase would result in a demand substantially over that which currently exists; therefore, the proposed project would not result in the need for new or expanded facilities and it would not make a considerable contribution to cumulative increases in the demand for public services and utilities.

As discussed under Impact 4.10.2, the proposed project has the potential to increase solid waste generation which would contribute to cumulative solid waste disposal at the American Avenue Landfill. The American Avenue Landfill has an estimated closure date of 2031 and has the capacity to meet the needs of build out of the City of Fresno, including the proposed project.

Furthermore, state regulations related to solid waste require construction and demolition debris generated on a jobsite to be reused, recycled, or otherwise diverted. Contractors hauling waste to

County transfer stations or landfills would be required to demonstrate reuse, recycling and diversion of construction debris prior to loads being accepted at those facilities consistent with AB 939.

As a result, the proposed project would not make a considerable contribution to cumulative increases in the demand for public services and utilities or in the amount of solid waste being disposed of at the American Avenue Landfill. Therefore, this cumulative impact is less than significant.

Mitigation (NT/F): None required.

Impact 4.10.8: Construction of the proposed project, in combination with other projects, could result in temporary interference or disruption of utility service. (Significant)

Near-Term and Future Project Elements

If proposed project facilities were to be installed concurrently with other projects in the same area, there is a potential for temporary interference or disruption of utility service. This would result in a significant cumulative impact for which the project would contribute to.

Mitigation Measures

Implementation of the following mitigation measure would reduce the project's contribution to less than considerable and this cumulative impact would be less than significant.

Measure 4.10.8 (NT/F): Implement Measure 4.10.6.

Significance After Mitigation: Less than Significant.

4.11 Aesthetics

This section addresses aesthetic and visual quality issues related to the proposed project. The existing visual character of the region and project area is addressed, along with the sensitive visual receptors and sensitive visual resources known to be present. Applicable City policies related to visual resources are presented. The impact analysis presents the standards used to evaluate impacts to visual quality and addresses potential effects of the proposed project on the aesthetic quality of the proposed project area.

4.11.1 Environmental Setting

Fresno County has a diverse visual landscape that gradually changes from east to west. Starting from the east are the Sierra Nevada which are rich in coniferous forests and provide scenic views of the varied topography. There are several scenic drives that wind their way through the Sierra and Sierra Foothill areas; however they are not officially designated state scenic highways. The built environment, including the City of Fresno, is located in the San Joaquin Valley and much of it located along the Highway 99 corridor. Agricultural lands consisting of orchards, vineyards, ranches, and various row crops start on the fringe of cities and rural communities and extend to cover much of the valley floor.

The City of Fresno is located in the central portion of Fresno County. The City possesses a predominantly urban and level landscape, and is bounded generally by the San Joaquin River to the north, SR 99 to the west, and the City of Clovis to the east. The area is defined by several natural and human-made aesthetic resources, including open spaces, agricultural areas, low rise commercial and residential development, as well as taller buildings which are visible in the City's downtown skyline. Urban development is clustered predominantly in the downtown core area that is encircled by less dense suburban areas. Rural open areas and agricultural uses are found in the city SOI and the area near the proposed SE SWTF.

4.11.2 Regulatory Setting

State

California Scenic Highway Program

Many state highways are located in areas of outstanding natural beauty. 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 highway may be designated scenic depending upon how much of the natural landscape 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.

According to Caltrans list of designated scenic highways under the California Scenic Highway Program, portions of SR 180, SR 168 and SR 198 are "eligible" for designation as scenic highways within Fresno County; however they have not been officially designated as such. Furthermore, none of the eligible portions of these highways are located within the proposed project area.

Local

2000 Fresno County General Plan

The 2000 Fresno County General Plan Open Space and Conservation Element Contains the following objectives and policies relevant to aesthetics and visual quality within the project area:

Policy OS-K.1 **Scenic Resource Preservation.** The County shall encourage the preservation of outstanding scenic views, panoramas, and vistas wherever possible. Methods to achieve this may include encouraging private property owners to enter into open space easements for designated scenic areas. *(RDR/PSP)*

Goal OS-L To conserve, protect, and maintain the scenic quality of land and landscape adjacent to scenic roads in Fresno County.

Policy OS-K.4 The County shall identify and map maintain an inventory and map of scenic resources within the county

Goal OS-K To conserve, protect, and maintain the scenic quality of Fresno County and discourage development that degrades areas of scenic quality.

2025 Fresno General Plan

The City of Fresno 2025 General Plan Urban Form Element contains the following objectives and policies relevant to aesthetics and visual quality within the project area:

Objective C-20: As part of the city's project review process, major emphasis will be given to site and building design in order to preserve functionality and community aesthetics.

Policy C-20e: Development projects shall include aesthetic measures which support functionality and add to the appearance and livability of the community.

Policy C-20f: The project developer shall provide a set of documents and drawings that will allow assessment of the final building product. Materials, texture, and colors shall be noted on the original special permit drawings and on construction plans.

- Development projects shall appropriately interface with adjacent properties.
- High-contrast or gaudy building facades, lighting and signage which create disharmony with adjacent properties, or which draw undue attention, should be avoided.
- Locate service truck access, loading zones, and waste storage/recycling areas at the maximum practical distance from residences and other living quarters.

- Shopping centers shall have internally unified building design, landscaping, and signage.
- Building facades shall include design features and decorative treatments. Visible sides of buildings shall not develop with featureless, "blank" walls.
- Adequately screen roof-mounted mechanical equipment, and ensure that such equipment adheres to noise standards as set forth in the General Plan Noise Element and City Noise Ordinance.
- Apply and enforce the city's Sign and Outdoor Advertising Ordinances. Pursue the amortization and removal of nonconforming and illegal signs and outdoor advertising structures.
- Landscaping and parking lot shading shall be employed for environmental and aesthetic improvement, while observing safe lines-of-sight along access routes.
- Exterior lighting shall not create glare for neighboring properties, but shall provide adequate on-site lighting for safety and security purposes.

Policy C-20g: Standards and guidelines shall ensure that metal buildings function as an acceptable and economical form of structures in specially defined areas, including areas adjacent to existing residential neighborhoods, along gateways, and areas adjacent to listed historic structures.

- New buildings with metal walls or metal roofs shall have appropriate finishes.
- Improve metal building appearance by use of steeper roof slopes and fascias, defined entryways, contrasting colors, concealed fasteners, parapet walls, and other treatments.
- Screen all unsightly mechanical equipment with parapet walls, mechanical wells, or other means. Roof vent color should match that of the roof. This distinctive pattern of ribs and joints in standing seam and other metal roofing materials should coordinate dimensionally with similar elements in exterior walls.
- The shape and slope of roof forms can enhance character and scale and should blend with surrounding buildings.
- Roof and wall colors, when appropriate, should also be coordinated with those on surrounding facades.

4.11.2 Impacts and Mitigation Measures

Methods of Analysis

The general approach for assessing visual change is based on the Federal Highway Administration (FHWA) method of visual resource analysis (which is also used for state highway projects by Caltrans). This method follows three basic steps: (1) defining the existing environment in terms of visual character and quality as well as viewer sensitivity and exposure; (2) assessing the degree of

resource change and viewer response; and (3) determine the significance of the visual impact. This approach is consistent with criteria from CEQA Guidelines, *Appendix G* listed below.

Significance Criteria

Based on the Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Have a substantial adverse effect on a scenic vista or substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings, within a state scenic highway;
- Substantially degrade the existing visual character or quality of the Master Plan area and its surroundings; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Impacts and Mitigation Measures

Table 4.11-1 provides a summary of the impact analysis for issues related to aesthetics.

TABLE 4.11-1
PROPOSED PROJECT IMPACT SUMMARY – AESTHETICS

	Near-Term Project Elements		Future Project Elements	
Impact	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.11.1: Implementation of the proposed project could adversely impact scenic vistas or scenic resources within a state scenic highway.	LS	NA	LS	NA
Impact 4.11.2: Implementation of the proposed project could degrade the existing visual character or quality of the project area.	S	LS	S	LS
Impact 4.11.3: Operation of project related facilities would introduce new sources of light and increase ambient light in the project area.	S	LS	S	LS
Impact 4.11.4: Implementation of the proposed project could make a cumulatively considerable contribution to adverse effects on the visual/aesthetic resources of local viewsheds in the project area.	S	LS	S	LS

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less than Significant Impact
NA = Not Applicable

Impacts and Mitigation Measures

Impact 4.11.1: Implementation of the proposed project could adversely impact scenic vistas or scenic resources within a state scenic highway. (Less than Significant)

Near-Term and Future Project Elements

There are no scenic vistas or resources designated in the City of Fresno 2025 General Plan. The plan area is predominantly urban and level, generally without topographic distinction. The primary topographic features visible from the project area are the distant Sierra Nevada, which begin approximately 30 miles east of the City and the Coast Range, which are over 40 miles west. Furthermore, no federal or state designated scenic resources are visible from within the project area; the portions of SR 180, SR 168 and SR 198 that are "eligible" for designation as scenic highways are not located within and are not visible from the project area.

The City of Fresno 2025 General Plan does identify road segments intended for designation as "scenic corridors or boulevards," however, these segments have not yet been officially designated as scenic corridors (City of Fresno, 2002). Near-term project elements do not impact these segments; and it is unlikely that future project elements would impact highways "eligible" for designation as only the proposed pipeline segments would be located in the vicinity of portions of SR 168. Pipelines would be buried and after installation, the topography would be returned to existing conditions and not be visible from scenic resources; therefore, the project would not adversely affect these designated scenic corridors and this impact would be less than significant.

Mitigation (NT/F): None required.

Impact 4.11.2: Implementation of the proposed project could degrade the existing visual character or quality of the project area. (Significant)

Near-Term Project Elements

Near-term project elements include the installation of transmission pipelines, construction and operation of the new SE SWTF, and expansion of the NE SWTF. Construction activities would require the use of heavy equipment, excavation and grading, and storage of materials on-site (including stockpiled soil) which could result in temporary changes to the visual character of the surrounding areas. Construction of Conveyance Option 1 would involve improvements to existing facilities, such as improvements to the Fresno Canal, Mill Ditch, and to an existing weir that would allow water to flow to the SE SWTF. Other improvements include lining and dredging portions of the Fresno Canal, and improvements to existing canal levees to support a maintenance road. Construction of transmission pipelines, including Conveyance Option 2, would involve installation of underground pipelines and associated appurtenances. Upon completion, trenches where the pipelines would be placed would be backfilled with on-site material and the surface elevation restored to match the original ground surface and pavement surface elevations. Appurtenances would be placed in underground vaults wherever feasible.

The proposed SE SWTF would be developed on a currently undeveloped 58 acre parcel surrounding by rural residential, agricultural and undeveloped uses currently designated as light industrial. The proposed new SE SWTF would include structures and treatment process facilities and supporting uses. The facility would also include solar panels on rooftops and ground mounted solar panels and a 100 foot tall radio tower. While this radio tower would represent a new urban feature for the project site, it would be a similar height to existing power poles in the project vicinity between Olive and Floradora Avenues that range in height from 86 feet to 91 feet. In addition, because the project site and vicinity is designated as light industrial, the proposed uses would be consistent with other industrial uses.

The existing NE SWTF is a recently constructed facility located near an existing residential neighborhood. Views of the facility from public roads are restricted due to safety fencing and surrounding landscaping. The planned expansion of this facility would not be anticipated to result in a significant change to the visual character of surrounding area.

Future Project Elements

The construction and operation of future project elements would occur in both rural and urban portions of the project area. Proposed facilities, such as wells, water storage facilities and groundwater treatment facilities could result in both short-term and long term impacts changes to visual character of the project area. Similar to near-term project elements, construction activities would require the use of heavy equipment and storage of materials on-site and could constitute as negative aesthetic elements in the visual landscape. Construction of visually prominent facilities such as water storage tanks or treatment facilities could present a significant permanent change to the visual character of the surrounding area.

Summary

Construction of proposed project facilities would result in temporary and permanent changes to the visual character in the project area. Near-term projects include the installation of transmission pipelines that would be backfilled and the surface elevations restored to existing conditions and associated appurtenances would be placed underground where feasible; therefore, installation of proposed transmission pipelines would not result in a significant impact to visual resources. Other project elements, such as the new SE SWTF, groundwater facilities, water storage tanks, and other new and modified SWTF would result in a permanent change to the surrounding visual character. As noted above, the proposed new SE SWTF includes installation of perimeter landscaping to help shield the facility from surrounding uses. Nevertheless, the proposed project would introduce new built facilities that would change the existing visual character and this is considered a significant impact.

Mitigation Measures

City of Fresno General Plan Objective C-20 states “As part of the city’s project review process, major emphasis will be given to site and building design in order to preserve functionality and community aesthetics.” While proposed project facilities would be guided by the General Plan, implementation of the following mitigation measures would reduce this impact to *a* less-than-

significant level by ensuring that proposed project facilities are designed to minimize the visual contrast with surrounding uses.

> **Measure 4.11.2a (NT/F):** During facility design, the design consultant shall prepare a landscape plan for each aboveground project facility. The landscape plan shall include measures to restore disturbed areas by reestablishing existing topography, including replanting trees and/or reseeding with a native seed mix typical of the immediately surrounding area. The landscape plan shall include a required seed mix and plant palate. Vegetation screening shall be included in the landscape plan in order to shield proposed aboveground facilities from public view. The landscape plan shall include a monitoring plan to ensure that the site restoration and the establishment of vegetation is successful.
>
> **Measure 4.11.2b (NT/F):** Surface water treatment facility design shall include non-glare exterior coatings that are colored an earth tone to blend in with the surrounding landscape.
>
> **Significance after Mitigation:** Less than Significant

Impact 4.11.3: Operation of project related facilities would introduce new sources of light and increase ambient light in the project area. (Significant)

Near-Term and Future Project Elements

Lighting would be installed at the proposed new SE SWTF and future SW SWTF. Exterior emergency lighting would be installed around other proposed project facilities including water tanks and pump stations. Exterior lighting could adversely affect day and nighttime views by introducing a new source of light and glare. This impact is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measure would reduce this impact to a less-than-significant level. Lighting at proposed project facilities, including new and expanded SWTFs, would be installed to adhere to City policies relating to the shielding of light to reduce potential negative effects from new light sources.

> **Measure 4.11.3 (NT/F):** Nighttime security lighting shall be equipped with directional shields that aim light downward and away from adjacent properties and public roadways. In addition, lighting fixtures shall be placed to concentrate light onsite to avoid spillover onto adjacent properties and public roadways.
>
> **Significance after Mitigation:** Less than Significant

The geographic scope of potential cumulative impacts to visual quality is the local viewsheds that could be affected by the proposed project facilities as viewed from public roadways, existing neighborhoods and planned mixed use areas.

Impact 4.11.4: Implementation of the proposed project could make a cumulatively considerable contribution to adverse effects on the visual/aesthetic resources of local viewsheds in the project area. (Significant)

Near-Term and Future Project Elements

Implementation of the proposed project in combination with other development in the same viewsheds could contribute to the degradation of the existing visual character or quality, as well as the introduction of new sources of light. This is considered a significant cumulative impact. Because the project would introduce new facilities in currently rural portions of the project area, its contribution to this cumulative impact would be considerable.

Mitigation Measures

City of Fresno General Plan Objective C-20 states "As part of the city's project review process, major emphasis will be given to site and building design in order to preserve functionality and community aesthetics." While proposed project facilities would be guided by the General Plan, implementation of the following mitigation measures would the proposed project's contribution to less than considerable and this cumulative impact would be less than significant.

Measure 4.11.4 (NT/F): Implement Measures 4.11.2 and 4.11.3.

Significance after Mitigation: Less than Significant

4.12 Cultural Resources

This section presents data on the previously recorded cultural resources within the proposed project area and the regional vicinity and discusses approaches to mitigate significant impacts to cultural resources. Cultural resources include, but are not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Paleontological resources, described below, are also addressed.

One comment letter was received addressing cultural resources in response to the NOP (see Appendix B). The Native American Heritage Commission recommended that a records search be conducted at the appropriate Information Center and that any identified cultural resources be appropriately surveyed and mitigated. In addition, it was recommended that the appropriate Native American contacts be consulted.

4.12.1 Environmental Setting

Natural Setting

The proposed project area is in the Fresno metropolitan area, within the San Joaquin Valley, a region with basin-type physiography. Basins are common in the San Joaquin Valley, and are commonly associated with hardpans and high clay content. Historically, this region supported extensive annual grasslands intermixed with a variety of vegetative communities including oak woodland, wetland, and riparian woodland. Intensive agricultural and urban development has resulted in large losses and conversion of these habitats. The remaining native vegetative communities exist as isolated remnant patches within urban and agricultural landscapes, or in areas where varied topography has made urban and/or agricultural development difficult.

Prehistoric Setting

Moratto (1984) provides an overview of the general prehistory of the San Joaquin Valley, summarized below.

During the Early Holocene, the area was populated by hunters of large game. Surface finds in the Tulare Basin have yielded some projectile points similar to particular Paleoindian variants (i.e., Clovis). This would suggest an initial occupation pre-dating 11,300 before present (B.P.). The Middle Holocene (4000 to 1000 B.C.) is characterized by pinto-like points, and groundstone tools, although its association is not certain. Excavations at Buena Vista Lake dating to after 2000 B.C. (Early Buena Vista Lake Phase) have uncovered handstones, millingstones, and extended burials.

As summarized in Moratto (1984), a chronology was devised for the southern San Joaquin Valley based on western Valley sites in 1969 by Olsen and Payen. It is composed of four temporally distinct complexes. The first complex, the Positas Complex ranges from 3300 to 2600 B.C. and is characterized by small shaped mortars, short cylindrical pestles, milling stones, perforated flat cobbles, and sea snail shell beads.

The Pacheco Complex, beginning in approximately 2600 B.C. and ending in roughly A.D. 300, has been divided into two phases. The Pacheco, Phase B (2600 to 1600 B.C.) is characterized by biface[1] arrow points, abalone shell ornaments, and sea snail shell beads. The Pacheco, Phase A (1600 B.C. to A.D. 300) is represented by more varied types of shell beads, perforated canine teeth, bone awls, whistles, and grass saws; large stemmed and side-notched points; and an abundance of millingstones, mortars, and pestles. The shell and bone industries of the Pacheco Complex are most comparable to the Delta Middle Horizon Period.

The Gonzaga Complex (A.D. 300 to 1000) is represented by an assemblage similar to that of the Delta Late Horizon, Phase 1. This complex is characterized by extended burials, bowl mortars and shaped pestles, squared and tapered stem projectile points, fewer bone awls and grass saws, and a shell industry composed of distinctive shell ornaments and beads.

The Panoche Complex (A.D. 1500 to European Contact) is most comparable to the Delta Late Horizon, Phase 2. This complex is characterized by the presence of few millingstones, and varied mortars and pestles; small side-notched arrow points; clamshell disc beads, bone awls, whistles, saws, and tubes. Extended burials and primary and secondary cremations are also characteristic of the Panoche Complex.

Ethnographic Setting

At the time of contact, the proposed project area consisted of the southernmost territory occupied by the Northern Valley Yokuts. The Northern Valley Yokuts historically lived in California along the San Joaquin River as far north as where it bends north between the Calaveras and the Mokelumne rivers, as far south as Fresno, to the west to the Diablo Range, and as far east as the foothills of the Sierra Nevada. The Yokuts may have been fairly recent arrivals in the San Joaquin Valley, perhaps being pushed out of the foothills about 500 years ago.

Because aboriginal populations in the San Joaquin Valley were decimated early, most information regarding the Northern Valley Yokuts is gleaned from accounts of Spanish military men and missionaries that have been translated. A summary of these sources has been compiled by W. J. Wallace (1978), and it is upon this work that this brief ethnographic setting is based.

Population estimates for the Northern Valley Yokuts vary from 11,000 to more than 31,000 individuals. Populations were concentrated along waterways and on the more hospitable east side of the San Joaquin River. Villages, or clusters of villages, made up “miniature tribes” (tribelets) lead by headmen. Principal settlements were located on the tops of low mounds, on or near the banks of the larger watercourses. Settlements were composed of single family dwellings, sweathouses, and ceremonial assembly chambers. Dwellings were small and lightly constructed, semi-subterranean and oval. The public structures were large and earth covered.

Most Northern Valley Yokuts groups had their first contact with Europeans in the early 1800s, when the Spanish began exploring the Delta. The gradual erosion of Yokuts culture began during the mission period. Epidemics of European diseases played a large role in the decimation of the

[1] Biface means worked on both sides of the proposed projectile point.

native population. With the secularization of the mission and the release of neophytes[2], tribal and territorial adjustments were set in motion. People returned to other groups, and a number of polyglot "tribes" were formed. Another blow to the aboriginal population came with the Gold Rush and its aftermath. In the rush to the southern mines, native populations were displaced from their existing territories. Ex-miners settling in the fertile valley applied further pressure to the native groups, and altered the landforms and waterways of the valley. Many Yokuts resorted to wage labor on farms and ranches. Others were settled on land set aside for them on the Fresno and Tule River Reserves.

Historic Setting

Lieutenant Gabriel Moraga recorded the earliest European presence in the Fresno area during the earliest years of the nineteenth century. Moraga made several expeditions into the San Joaquin Valley to pursue runaway neophytes or find new potential mission sites and territories; however no permanent Spanish settlements were constructed in the vicinity. In 1826, Euro-American trappers, including Jedediah Strong Smith, began to enter the region in order to hunt the fur bearing animals that inhabited the Central Valley. Land grants issues by Spanish, and later Mexican, governors aided settlement of the valley, giving settlers large sections of land to use for farming and raising cattle. Prior to the Gold Rush, the San Joaquin Valley was devoted to grazing and hunting, as immense herds of cattle and some horses roamed the valley. With the resulting influx of population with the Gold Rush, food production was needed to support the mines, and the San Joaquin Valley developed to become an agricultural supplier. Some of the miners, disappointed in the search for gold, turned to farming in the fertile swamp lands in the San Joaquin Valley (Hoover, 2002).

State legislation in 1856 organized Fresno County from portions of Mariposa, Merced and Tulare Counties. The government originally designated the town of Millerton, located twenty-five miles south of Fresno, as the first seat of government for Fresno County. The development of the Central Pacific Railroad (predecessor of the Southern Pacific Railroad) in 1872 resulted in the creation of the town of Fresno, originally called "Fresno Station" (Gudde, 1998). Edward H. Mix surveyed the original town site and organized it on a grid straddling the rail corridor and extending to the east side of the Central Pacific Railroad tracks along Front Street (present day H Street). By November 1872, Fresno had grown to include four hotels and restaurants, saloons, three livery stables, two stores, and a few permanent dwellings (Clough and Secrest, 1984). Following the destruction resulting from a major flood in Millerton in 1867, locals decided to move the county seat to Fresno in 1874. By the end of 1874, Fresno Station had grown to fifty-five buildings, including a county hospital and a school (Clough and Secrest, 1984). The railroad through Fresno County connected the northern part of California with Los Angeles, and the City of Fresno developed as one of the largest communities along the rail corridor. The agricultural success of the land, and the service and mobility made possible with the railroad, enabled Fresno to become the leading agricultural center of the San Joaquin Valley.

Prior to the 1870s, "dry farming" dominated Fresno County between the San Joaquin and Kings Rivers. Dry farming relied on spring rains, however the 1860s experienced extensive drought years, causing residents to explore alternative means or providing water for crops. Settlers dug

[2] Native Americans who had converted to Christianity

ditches along major drainages, such as the Kings River, with the earliest supplying water to the community of Centerville via the Centerville Ditch (soon combined with the Sweem Ditch). In 1870, Moses Church purchased the Centerville and Sweem Ditches, and began enlarging and improving the canals, turning them towards Fresno. Seeing the success of these efforts, landholders in Fresno began exploring irrigation as a means of improving their lands. In 1871Captain A.Y. Easterby, F Roeding, and William Chapman joined forces, purchasing the majority of the Centerville and Sweem water rights, and established the Fresno Canal and Irrigation Company. Church acted as superintendent of the newly formed Fresno Canal and Irrigation Company, and work began immediately on the construction of the Fresno Canal, measuring "20 feet wide on the bottom, 30 feet on the top, and 4 feet deep"(Grunsky, 1898). Expanding and enlarging natural waterways, as well as connecting with the Centerville and Sweem ditches, the Fresno Canal was completed in segments and in 1875 (Wallace W. Elliot Publishing Company, 1882). The Mill Ditch branch of the Fresno Canal was constructed in 1877 to divert water to a flour mill in downtown Fresno, but was soon converted to provide water to outlying colonies, including the Temperance Colony.

The City of Fresno pioneered gravity irrigation, which transformed the arid land into rich soil, enabling farming throughout Fresno County. As the geographical center of Fresno County, as well as California itself, Fresno acted as a trade center for the entire Central Valley (Hoover, 2002). Fresno incorporated in 1885, as a result of the prosperity brought about in the region by the introduction of irrigation.

Fresno in the Twentieth Century

During the 1890s the city expanded from 2.94 square miles in 1890, to 34.862 square miles in 1900, with an increase in population from 10,818 to 12,470 (Clough and Secrest, 1984). The 1910 census for Fresno showed a total population of 24,892. City boosters, hoping to double the population within a few short years, promoted Fresno as an attractive and modern Californian city, with handsome public buildings, established city parks, numerous banks and commercial opportunities, and large tracts of developable land outside the city proper (City of Fresno, 2008).

As the population grew, so did the City leader's desire to improve the reputation and prestige of the City through metropolitan planning. On April 21, 1916, the Fresno City Board of Trustees passed ordinance No. 794. This established Fresno's first planning commission and hired architect and planner Charles Henry Chaney to prepare a plan for Fresno to address anticipated growth following World War I. Chaney's plan proposed a civic center, a street system to accommodate increased automobile use, a park and recreation plan, a scenic road and boulevard system, and downtown revitalization. The recommendations were filed in 1918, but were not adopted by the city until July 1923 and did not become effective until that August (City of Fresno, 2008).

Throughout the prosperous 1920s, new residents flocked to Fresno, attracted by the City's agricultural wealth and prosperity. The Great Depression that began in 1929 had a significant impact on the San Joaquin Valley, with a great influx of people seeking employment in an already strained market. Midwestern farmers who could not find employment in the agricultural industry came to cities like Fresno looking for other forms of employment, but few urban jobs were available. President

Franklin Delano Roosevelt's New Deal Program (1933-1939) sought to provide economic relief by providing assistance to large numbers of unemployed workers. In Fresno, the New Deal resulted in improvements to Fresno's Civic Center as well as five new buildings between 1936 and 1941: the Fresno Memorial Auditorium, the U.S. Post Office, the Fresno County Hall of Records (adjacent to the County Courthouse), the Fresno Unified School District Administration Building, and the Fresno City Hall (City of Fresno, 2008).

Mobilization of industry in support of World War II ultimately ended the Great Depression. During the war, the nation's resources were devoted to the War efforts, with the United States acting as the primary manufacturer of war material for the European allies. California experienced a boost in the states regional economy upon receiving almost 12% of the government war contracts and producing 17% of all war supplies. In addition to increased employment resulting from supporting the war effort, military bases were established throughout California resulting in an influx of servicemen and support staff. Increased employment led to an increase in personal income, which in turn improved the circumstances of both individuals and cities (City of Fresno, 2008).

In the years following World War II, California experienced a period of prosperity with unprecedented urban growth and economic expansion. In Fresno, the 1940 census reported 60,685 people, while the 1950 census reported a population of 91,669, not including Japanese citizens or military personnel. The population boom resulted in extensive building efforts with new civic and public buildings, highways, residential and commercial developments. Architecture moved away from historic styles and focused on more modernist elements and innovations (City of Fresno, 2008).

Suburban expansion drove much of the residential and commercial development outside of city centers. Agricultural parcels were subdivided to establish tract homes and regional shopping centers and facilities that would provide services for the new population. Additionally, community and regional planning during the mid-twentieth century was highly influenced by the automobile and freeways. Automobiles enabled people to move farther away from the downtown, resulting in businesses as well as municipal services expanding or moving to accommodate their customers' needs (City of Fresno, 2008).

Paleontological Setting

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered nonrenewable resources because the organisms they represent no longer exist. Once destroyed, a fossil can never be replaced. The following sections discuss existing conditions with respect to paleontological resources in the proposed project area.

Paleontological Assessment Standards

The Society of Vertebrate Paleontology (SVP) has established guidelines for the identification, assessment, and mitigation of adverse impacts on nonrenewable paleontological resources (SVP, 1995; 1996). Most practicing paleontologists in the nation adhere closely to the SVP's assessment, mitigation, and monitoring requirements as outlined in these guidelines, which were approved through a consensus of professional paleontologists and are the standard against which paleontological monitoring and mitigation programs are judged.

The SVP (1995) outlined criteria for screening the paleontological potential[3] of rock units and established assessment and mitigation procedures tailored to such potential. Table 4.12-1 lists the criteria for high-potential, undetermined, and low-potential rock units.

TABLE 4.12-1
PALEONTOLOGICAL POTENTIAL CRITERIA

Paleontological Potential	Description
High	Geologic units from which vertebrate or significant invertebrate or plant fossils have been recovered. Only invertebrate fossils that provide new information on existing flora or fauna or on the age of a rock unit would be considered significant.
Undetermined	Geologic units for which little to no information is available.
Low	Geologic units that are not known to have produced a substantial body of significant paleontological material.

SOURCE: SVP, 1995.

Paleontological Resource Potential

The fossil yielding potential of a particular area is highly dependent on the geologic age and origin of the underlying rocks. The entire Fresno area is underlain by all three Quaternary formations of the eastern San Joaquin Valley: the Turlock Lake Formation, the Riverbank Formation and the Modesto Formation (Dundas, 2010). These formations are associated with at least five episodes of aggradation[4] and progradation[5] on stream-dominated alluvial fans associated with alpine glacial-cycles (Weissman et al., 2002). This means the entire Fresno area is underlain by continental stream deposits (sand, silt, and gravel) derived from the Sierra Nevada which may potentially contain the buried remains of once-living organisms.

Numerous existing fossil localities within these formations provide evidence that they represent rock units if high paleontological, per SVP criteria (see Table 4.12-1). For example:

- Along the San Joaquin River Parkway near Rice and Friant roads in Fresno, the Modesto Formation has produced a giant bison (*Bison latifrons*) locality. The fossil was discovered along an eroding outcrop in 2006 and was determined to be approximately 19,000 year in age (Dundas, 2009).

3 Paleontological potential refers to the likelihood that a rock unit will yield a unique or significant paleontological resource.
4 The vertical component of coastal onlap.
5 Outward or basinward building of a shoreline when the rate of sediment supply at the shoreline exceeds the rate of relative rise in sea level.

- Both the Caltrans State Route 180 west and east proposed projects produced mammoth and camel fossils, primarily from the Riverbank Formation with a few specimens from the Turlock Lake Formation. These fossils were recovered from three localities during excavation of drainage basins for the highway between Brawley Ave. and Hughes West Diagonal, or MP 53.3 through MP 55.8 (CalState Fresno, 2008).
- North of Fresno, the Turlock Lake Formation is most famous for having yielded a diverse assemblage of vertebrate fossils, dominated by large herbivorous mammals, from Madera County's Fairmead Landfill (Dundas, 1996).

This information is sufficient to conclude that all *in-situ*[6] geological formations underlying the Fresno area would be considered areas of high paleontological potential per SVP (1995) criteria.

However, it is important to note that surficial soils overlying the three formations discussed above are not *in-situ* geologic deposits. Based on dozens of observations in the Fresno area, disturbed soils, reworked sediment, imported artificial fills and/or recent floodplain deposits are generally thought to occur within a minimum depth of six feet below the ground surface (Dundas, 2010). Artificial fills are engineered mixtures of sand, silt and gravel used to prepare areas for urban development and are sourced from natural geologic deposits, but have been excavated, reworked, and transported to their present location. If artificial fills contain fossilized remains, they would be severely damaged and fragmented, unidentifiable, and could not be placed within the fossil record. Additionally, recent floodplain deposits (less than 5000 years old) are geologically immature and are unlikely to have *in-situ* fossils (fossilization processes take place over tens of thousands of years). Recent floodplain deposits, artificial fills and disturbed soils are unlikely to yield fossils that could contribute significantly to science or natural history, and are considered as having a low paleontological resource potential (Table 4.12-1).

4.12.2 Regulatory Setting

Federal

National Register of Historic Places

The National Register of Historic Places (National Register) is the nation's master inventory of known historic resources. The National Register is administered by the National Park Service and includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level.

Structures, sites, buildings, districts, and objects over 50 years of age can be listed in the National Register as significant historical resources. Properties under 50 years of age that are of exceptional importance or are contributors to a district can also be included in the National Register. The criteria for listing in the National Register include resources that:

- Are associated with events that have made a significant contribution to the broad patterns of history;
- Are associated with the lives of persons significant in our past;

[6] In-place, representing the original location of deposition.

- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Have yielded or may likely yield information important in prehistory or history.

State

California Environmental Quality Act

CEQA requires that public or private projects financed or approved by public agencies assess the effects of the project on historical resources. CEQA also applies to effects on archaeological sites, which may be included among "historical resources" as defined by CEQA Guidelines, section 15064.5, subdivision (a), or may be subject to the provisions of PRC Section 21083.2, which governs review of "unique archaeological resources." Historical resources generally include buildings, sites, structures, objects, or districts, each of which may have historical, architectural, archaeological, cultural, or scientific significance.

Under CEQA, "historical resources" include the following:

- A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (PRC, Section 5024.1).
- A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the PRC or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, will be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource will be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register of Historical Resources (PRC, Section 5024.1), including the following:
    - Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
    - Is associated with the lives of persons important in our past;
    - Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
    - Has yielded, or may be likely to yield, information important in prehistory or history.
- The fact that a resource is not listed in or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to Section 5020.1[k] of the PRC), or identified in a historical resources survey (meeting the criteria in Section 5024.1[g] of the PRC) does not preclude a lead agency from determining that the resource may be a historical resource as defined in PRC Section 5020.1(j) or 5024.1.

Archaeological resources that are not historical resources according to the above definitions may be "unique archaeological resources" as defined in PRC Section 21083.2, which also generally provides that "non-unique archaeological resources" do not receive any protection under CEQA. If an archaeological resource is neither a unique archaeological nor a historical resource, the effects of the project on those resources will not be considered a significant effect on the environment.

Paleontological resources are explicitly afforded protection by CEQA section V(c) of Appendix G, the "Environmental Checklist Form", which addresses the potential for adverse impacts to "unique paleontological resource[s] or site[s] or … unique geological feature[s]". This provision discusses significant fossils – remains of species or genera new to science, for example, or fossils exhibiting features not previously recognized for a given animal group – as well as localities that yield fossils significant in their abundance, diversity, preservation, and so forth. Mitigation of adverse impacts to paleontological resources is therefore required under CEQA.

CEQA requires that if a project results in an effect that may cause a substantial adverse change in the significance of a historical resource, or would cause significant effects on a unique archaeological resource, then alternative plans or mitigation measures must be considered. Prior to assessing effects or developing mitigation measures, the significance of cultural resources must first be determined. The steps that are normally taken in a cultural resources investigation for CEQA compliance are as follows:

- Identify potential historical resources
- Evaluate the eligibility of historical resources
- Evaluate the effects of the project on eligible historical resources

Public Resources Code

The PRC, Chapter 1.7, sections 5097.5 and 30244 regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.

Local

Fresno County 2000 General Plan

The Fresno County 2000 General Plan (2013) Open Space and Conservation Element contains several objectives and policies relevant to the protection of cultural resources within the project area. The Historical, Cultural, and Geological Resources section of the Open Space and Conservation Element provides policies directing the protection of historical, archaeological, and paleontological resources within the County.

Goal OS-J To identify, protect, and enhance Fresno County's important historical, archeological, paleontological, geological, and cultural sites and their contributing environment, and promote and encourage preservation, restoration, and rehabilitation of Fresno County's historically significant resources in order to promote historical awareness, community identify, and to

recognize the county's valued assets that have contributed to past county events, trends, styles of architecture, and economy.

Policy OS-J.1 **Preservation of Historic Resources.** The County shall encourage preservation of any sites and/or buildings identified as having historical significance pursuant to the list maintained by the Fresno County Historic Landmarks and Records Advisory Commission.

Policy OS-J.2 **Historic Resources Consideration.** The County shall consider historic resources during preparation or evaluation of plans and discretionary development projects.

Policy OS-J.14 **Sites Protection and Mitigation.** The County shall require that discretionary development projects, as part of any required CEQA review, identify and protect important historical, archeological, paleontological, and cultural sites and their contributing environment from damage, destruction, and abuse to the maximum extent feasible. Project-level mitigation shall include accurate site surveys, consideration of project alternatives to preserve archeological and historic resources, and provision for resource recovery and preservation when displacement is unavoidable.

City of Fresno 2025 General Plan

The City of Fresno 2025 General Plan (2002) Resource Conservation Element Historic Resources section contains several objectives and policies relevant to the protection of cultural resources within the project area. The Historic Resources section of the Resource Conservation Element provides policy direction to protect, and to continue appropriate use of, Fresno's historic resources.

G-11. Objective Safeguard Fresno's heritage by preserving resources which reflect important cultural, social, economic, and architectural features so that community residents will have a foundation upon which to measure and direct physical change.

G-11-d Policy Prehistoric resources (those containing archaeological and paleontological material) shall be protected.

- In any public or private project it shall be a condition of project permits that work stop immediately in the immediate vicinity of a find if archaeological and/or nonhuman fossil material is encountered on the project site.
- If there are suspected human remains, the Fresno County Coroner shall be immediately contacted. If the remains or other archaeological materials are possibly Native American in origin, the Native American Heritage Commission shall be immediately contacted, and the California Archaeological Inventory's Southern San Joaquin Valley Information Center shall be contacted to obtain a referral list of recognized archaeologists.

- An archaeological assessment shall be conducted for the project if prehistoric human relics are found that were not previously assessed during the environmental assessment for the project. The site shall be formally recorded, and archaeologists' recommendations shall be made to the city on further site investigation or site avoidance/preservation measure.
- If non human fossils are uncovered, the Museum of Paleontology at U.C. Berkeley shall be contacted to obtain a referral list of recognized paleontologists. If the paleontologist determines the material to be significant, it shall be preserved.

G-11-e Policy If the site of a proposed development or public works project is found to contain unique prehistoric (archaeological or paleontological) resources, and it can be demonstrated that the project will cause damage to these resources, reasonable efforts shall be made to permit any or all of the resource to be scientifically removed, or it shall be preserved in situ (left in an undisturbed state). In situ preservation may include the following options, or equivalent measures:

- amending construction pans to avoid prehistoric resources
- setting aside sites containing these resources by deeding them into permanent conservation easements
- capping or covering these resources with a protective layer of sole before building on the sites
- incorporating parks, green space, or other open space in the project to leave prehistoric sites undisturbed and to provide a protective cover over them
- in order to protect prehistoric resources from vandalism or theft, their location shall not be publically disclosed until or unless the site is adequately protected.

City of Fresno Historic Preservation Ordinance

Section 12-1601 through 12-1629 of the Fresno Municipal Code outlines the City of Fresno Historic Preservation Ordinance (1979, updated 1999), which is designed to "to preserve, promote and improve the historic resources and districts of the City of Fresno for educational, cultural, economic and general welfare of the public…." The ordinance establishes the Historic Preservation Committee, identifies the Designation Criteria for registering a local historic resource, and guidance for the alteration or demolition of locally designated historic resources within the City. Designation criteria for a locally registered historic resource, which includes the following criteria:

1. It has been in existence more than fifty years and it possesses integrity of location, design, setting, materials, workmanship, feeling and association, and:
    a. It is associated with events that have made a significant contribution to the broad patterns of our history; or
    b. It is associated with the lives of persons significant in our past; or

c. It embodies the distinctive characteristics of a type, period or method of construction, or represents the work of a master, or possesses high artistic values; or

d. It has yielded or may be likely to yield, information important in prehistory or history.

2. It has been in existence less than fifty years, it meets the criteria of subdivision (1) of subsection (a) of this section and is of exceptional importance within the appropriate historical context, local, state or national.

The ordinance also includes guidance for the alteration or demolition of locally designated historic resources within the City. Section 12-16017h of the Fresno Municipal Code states that no application or proposal shall be approved or approved with modifications unless the Commission makes the following findings:

a. The proposed work is found to be consistent with the purposes of this article and the Secretary of the Interior's Standards, not detrimental to the special historical, architectural or aesthetic interest or value of the Historic Resource; or

b. The action proposed is necessary to correct an unsafe or dangerous condition on the property; or

c. Denial of the application will result in unreasonable economic hardship to the owner. In order to approve the application, the Commission must find facts and circumstances, not of the applicant's own making, which establish that there are no feasible measures that can be taken that will enable the property owner to make a reasonable economic beneficial use of the property or derive a reasonable economic return from the property in its current form; or

d. The site is required for a public use which will directly benefit the public health, safety and welfare and will be of more benefit to the public than the Historic Resource.

e. For applications for relocation of an Historic Resource, the Commission shall find that one or more of the above conditions exist, that relocation will not destroy the historical, architectural or aesthetic value of the Resource and that the relocation is part of a definitive series of actions which will assure the preservation of the Resource.

Records Search

ESA staff conducted a records search at the Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System at California State University Bakersfield on July 27, 2010 (File No. RS# 10-291) and October 21, 2013 (File No. RS#13-429). Records were accessed by reviewing the Lanes Bridge, Friant, Herndon, Fresno North, Clovis, Kearney Park, Fresno South, Round Table, Sanger, and Malaga, California 7.5-minute quadrangle base maps. The records search was conducted for the proposed project area in order to: (1) determine whether known cultural resources had been recorded within or adjacent to the proposed project area; (2) assess the likelihood of unrecorded cultural resources based on historical references and the distribution of environmental settings of nearby sites; and (3) develop a context for identification and preliminary evaluation of cultural resources.

Included in the review were the *California Inventory of Historical Resources* California Department of Parks and Recreation (1976), the Caltrans Local and State Historic Bridge Inventories (2013), and the *Historic Properties Directory Listing* (Office of Historic Preservation, 2010 and 2013).

The Historic Properties Directory (HPD) includes listings of the California and National Registers, and the most recent listing of the California Historical Landmarks and California Points of Historical Interest. Staff conducted additional research completed by reviewing the files of the City of Fresno Office of Historic Preservation, the Fresno State University Special Collections Archive, and the San Joaquin Valley Heritage & Genealogy Center at the main branch of the Fresno Public Library.

Archival Search Results

Results of the 2010 records search indicate that only a small portion of the proposed near-term project areas and vicinities has been previously surveyed for cultural resources. Within the near-term project areas, the records search results listed 36 previous cultural resource studies conducted, and 26 additional studies conducted within ¼ mile buffer of the plan area. Information Center staff identified three known cultural resources within the near-term project area, and 17 additional resources recorded within the ¼ mile buffer of the near-term project elements.

Results of the 2013 records search update identified two resources within the Conveyance Option 1 alignment, including a bridge and a prehistoric site on farmland immediately outside of the alignment. No other resources were identified within the near-term project elements. Table 4.12-2 below describes the cultural resources that were identified as within or intersecting the near-term project elements.

TABLE 4.12-2
CULTURAL RESOURCES LOCATED WITHIN NEAR-TERM PROJECT ELEMENTS

Resource Name	Description	Eligibility Determination	Project Component Impacted
Golden State Boulevard Bridge Railway (Caltrans Bridge # 42C0084)	The Golden State Boulevard Bridge over North Avenue and the Burlington Northern Santa Fe Railway	5S1 (listed on local register)	Transmission System
1333-1353 N Palm Bungalow Court	Historic period residential complex	3CS/5S3 (appears eligible for CR and local register)	Transmission System
BNSF RR Bridge over Herndon Canal	Railroad bridge over Herndon Canal.	6Z (found ineligible)	Transmission System
11W-Fresno Canal Bridge (P-10-4716)	a single poured concrete span bridge over Fresno Canal	Category 5, Ineligible for listing in NRHP	Raw Water Intake and Conveyance Facilities, Option 1A
Ground Stone Artifact Scatter (P-10-2189)	archaeological site consisting of twenty-one manos, three mano fragments, two metates and one metate fragment in a regularly cultivated farmland	Not evaluated	Raw Water Intake and Conveyance Facilities, Option 1A

Caltrans Bridge Inventory Results

ESA staff reviewed bridges located along Option 1against Caltran's Historic Bridge Inventory (2013). Table 4.12-3 describes the eligibility of bridges within Conveyance Option 1. None of the bridges located were identified as eligible for listing in the National Register.

TABLE 4.12-3
BRIDGE ELIGIBILITY DETERMINATIONS WITHIN RAW WATER INTAKE AND CONVEYANCE FACILITIES, OPTION 1A

Bridge Name/Location	Year Built	Caltrans Eligibility Determination
N Armstrong Ave over Mill Ditch	1996	Category 5, ineligible for listing in the National Register
N Fancher Ave over Mill Ditch	1939	Category 5, ineligible for listing in the National Register
N McCall Ave over Fresno Canal	1953	Category 5, ineligible for listing in the National Register
N Del Rey Ave over Fresno Canal	1939	Category 5, ineligible for listing in the National Register
N Academy Ave over Fresno Canal	1942	Category 5, ineligible for listing in the National Register
N MacDonough Ave over Fresno Canal	1948	Category 5, ineligible for listing in the National Register
N Viau Ave over Fresno Canal	1925	Category 5, ineligible for listing in the National Register
E Flume Rd over Fresno Canal	1940	Category 5, ineligible for listing in the National Register

SOURCE: Caltrans Historic Bridge Inventory, 2013

Federal, State, and Local Register Listings within the City of Fresno

Within the City of Fresno, there are four California State Historic Landmarks, five California Points of Historic Interest, 36 sites listed on the California Register, and 40 sites listed on the National Register (total 85 recorded historic resources). Table 4.12-4 describes these resources, In addition Fresno maintains a local historic register, which lists 283 individual properties of which 271 are still in existence (others have burned, been relocated, etc.) within the City limits, including several buildings already listed on the California Register and the National Register. The City also has three designed historic districts.

TABLE 4.12-4
LISTED HISTORIC RESOURCES WITHIN THE CITY OF FRESNO

California Stat e Historic Landmark
SHL 803 - Site of first junior college in California
SHL 873 - Site of Fresno Free Speech Fight of the Industrial Workers of the World
SHL 916 - Forestiere Underground Gardens
SHL 934 - Temporary Detention Camps for Japanese Americans - Fresno Assembly Center
California Point of Historic Interest
FRE-002 - M. Theo Kearney Park and Mansion
FRE-008 - Meux Home
FRE-010 - Y.W.C.A. Residence
FRE-011 - Former Einstein Home
FRE-013 - Fig Garden Woman's Club
National Register of Historic Places
Bank of Italy Building (1015 Fulton Mall)
Bell Tower (7160 Kearney Blvd)
Blacksmith Shop (7160 Kearney Blvd)
Brix Home / Brix Mansion (2844 Fresno St)
Carriage house (7160 Kearney Blvd)
Einstein Residence (1600 M St)
Forestiere Underground Gardens (5021 W Shaw St)
Frank Romain Home (2055 San Joaquin St)

TABLE 4.12-4
LISTED HISTORIC RESOURCES WITHIN THE CITY OF FRESNO

Fresno Assembly Center - Temporary Housing for Japanese Americans (Chance Av)
Fresno Bee Building (1555 Van Ness Ave)
Fresno Brewery/Mingle Tranportation (100 M st)
Fresno Consumers Ice Co Warehouse (764 P St)
Fresno Memorial Auditorium (2425 Fresno St)
Fresno Normal School/Old Administration Building (1101 E University Ave)
Fresno Republican Printery Building (2130 Kern St)
Fresno Sanitary Landfill (West Ave)
Holy Trinity Armenian Church (2226 Ventura St)
Hotel Californian (851 Van Ness Ave)
Ice house (7160 Kearney Blvd)
Industrial Workers of the World Fresno (Fulton St)
Kearney Park & Mansion (7160 Kearney Blvd)
Maulbridge Apartments (2344 Tulare St)
Meux House (1007 R St)
Oil House (7160 Kearney Blvd)
Old Fresno Water Tower (2444 Fresno St)
Paul Kindler House/the castle (1520 E Olive Ave)
Physicians Building/Civic Center Prof (2607 Fresno St)
Rehorn Residence (1050 S St)
San Joaquin Light & Power Company (1401 Fulton St)
Santa Fe Hotel (2055 Santa Fe Ave)
Santa Fe Passenger Depot (2650 Tulare St)
So Pacific Passenger Depot (1033 H St)
Swift Company Warehouse (744 P St)
Tarpey Depot (7160 Kearney Blvd)
Tower Theatre (1201 N Wishon Ave)
Twining Laboratories (2527 Fresno St)
Warehouse Row Buildings (P St)
Warner's Theater/Pantages Theater (1400 Fulton St)
Wormser Warehouse (722 P St)
YWCA Residence (1660 M St)
California Register of Historical Resources
1225 E Divisidero Ave
136 N Roosevelt Ave
254 N Roosevelt Ave
308 N Ferger Ave
4672 E Nevada Ave
Albert G Wishon House (340 N Fulton St)
August Nieto House (2349 N Barton Ave)
Black Home (1727 L St)
Brewer Adobe (5901 W Shaw Ave)
Bridge #42C-0071 (Weber Ave)
Burnett Nurses Home (120 N Howard St)
Charles F Crooks House (5926 S Elm Ave)
Cobb House (437 N Fulton St)
Cobb-Wheeler Residence (1175 Herndon Ave)

TABLE 4.12-4
LISTED HISTORIC RESOURCES WITHIN THE CITY OF FRESNO

Danish Lutheran Bethel (187 N Broadway St)
Eaton Flats (125 N Fresno St)
Ernest and Hazel Wolf Residence (1323 Herndon Ave)
Fire Alarm Station (Divisidero Street)
Fresno First Church of Christ (1615 N St)
George H Larsen House (486 N Poplar Ave)
Gerlitz Home (121 N U St)
Ira H Brooks House (350 N Fulton St)
Ivan C McIndoo House (410 N Van Ness)
Jacob Andreas House (309 E St)
Jensen Ranch (8626 Bethel Ave)
John G Porter House (420 N Van Ness Ave)
Kearney Blvd
McIndoo House (345 N Van Ness Ave)
Mission Funeral Home (475 N Broadway St)
Norman J Levinson House (429 N Van Ness Ave)
Pacific Southwest Building (1060 Fulton Mall)
Peter Steite House (2157 S Lily Ave)
Standard Oil/Union Oil Warehouse (101 N Roosevelt Ave)
Steinhauer House (450 C Street)
Truman Kahler Complex (2599 Tollhouse St)
William Hanger House (425 N Van Ness Ave)

SOURCE: SSJVIC, 2010, OHP 2010

Field Survey

On December 1-2, 2011, ESA archaeologist Brian Marks and historian Katherine Anderson conducted a phase I cultural resources survey of the near-term project elements. This included a pedestrian survey of undeveloped treatment plant locations (including the SE SWTF), and windshield surveys of urban and developed areas.

ESA staff Katherine Anderson, M.A. and Michael Vader B.A. conducted phase I cultural resource surveys of the Conveyance Option 1 (Fresno Canal) alignment and the Conveyance Option 2 alignment on October 23, 2013. A pedestrian survey was conducted for the Conveyance Option 1 project area wherein accessible portions of the access roads on each side of the Fresno Canal and Mill Ditch were surveyed on foot. The Conveyance Option 2 project area was subject to a survey strategy wherein unimproved shoulders along the Belmont Avenue and Trimmer Springs right-of-ways were surveyed on foot, while the more developed areas along the roadways were subject to a windshield survey for the presence of historic-period built resources.

Approximately 60 percent of the proposed Conveyance Option 1 alignment was accessible and was subject to a pedestrian survey. Large portions of the project area were within private property and were not surveyed due to the lack of access agreements. Ground surface visibility on the access roads within the Conveyance Option 1 alignment was 100 percent throughout. No surface

evidence of cultural resources was observed, however ESA staff documented the Mill Ditch/Fresno Canal with digital photography.

Approximately 10 percent of the proposed Conveyance Option 2 project area was subject to a pedestrian survey, with the remaining 90 percent being subject to a windshield survey. Much of the western and central portions of the Conveyance Option 2 project area were largely developed and consisted of paved or otherwise disturbed road shoulders along the Belmont Avenue and Trimmer Springs right-of-ways. The portions of the project area that were subject to a pedestrian survey were primarily located along the far eastern portions of the alignments where orchards and agricultural fields were present and the shoulders of the roadway were less likely to be improved. Ground surface visibility for the areas subject to pedestrian survey ranged from approximately 75 to 100 percent. No surface evidence of cultural resources was observed.

Native American Contact

The Native American Heritage Commission (NAHC) was contacted on September 30, 2010 to request a database search for sacred lands or other cultural properties of significance within or adjacent to the proposed project area. A response was received on August 9, 2010. The sacred lands survey did not identify the presence of cultural resources in the proposed project area, with the exception of the area within ½ mile of the Friant and Herndon Quadrangles. The NAHC provided a list of Native American contacts that might have further knowledge of the proposed project area with respect to cultural resources. Each person or organization identified by the NAHC was contacted by letter on March 3, 2010. On April 7, 2010, ESA received a letter from the Table Mountain Rancheria stating that they declined to participate, but would appreciate being notified if cultural resources are identified. On August 31, 2010, ESA received an email from Danielle Flowers of the Table Mountain Rancheria requesting more detailed information about any work proposed in the area around Behymer and Willow Avenues. ESA responded with additional information in September 1, 2010, and Ms Flowers stated that the project is out of their area of concern. A second round of letters was sent out November 8, 2013, describing the current project description. No additional responses have been received as of the writing of this report (November 2013).

4.12.2 Impacts and Mitigation Measures

Method of Analysis

Due to the geographic scale of the proposed project area and the wide range of actions that fall within the scope of the proposed future actions under the proposed Metro Plan, impact analysis of future actions is intended as a preliminary assessment of potential impacts on important cultural resources that could occur as a result of future proposed projects. Because this is a preliminary analysis, the level of impacts on specific cultural resources that could result from individual future proposed projects are not addressed in this document, but need to be assessed through additional analysis as proposed projects are identified and defined. While many historic or cultural sites have been identified within the proposed project area, few have been revisited since their initial recordation, nor have many been evaluated or re-evaluated in accordance with

sections 15064.5(a)(2-3) of the CEQA Guidelines, using the criteria outlined in the PRC Section 5024.1. A qualitative assessment of a given cultural resource and its significance is a necessary precursor to conclude whether a proposed project may adversely affect an "historic resource."

TABLE 4.12-5
PROPOSED PROJECT IMPACT SUMMARY – CULTURAL RESOURCES

	Near-Term Project Elements		Future Project Elements	
Impact	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**
Impact 4.12.1: Implementation of the proposed project could adversely impact historic architectural resources directly through demolition or substantial alteration, or indirectly through changes to historical setting.	S	SU	S	SU
Impact 4.12.2: Implementation of the proposed project could result in damage or destruction of known or previously unidentified archeological resources.	S	LS	S	LS
Impact 4.12.3: Ground-disturbing activities associated with construction of the proposed project could result in damage to previously unidentified human remains.	S	LS	S	LS
Impact 4.12.4: Ground-disturbing construction associated with implementation of the proposed project could result in disturbance or destruction of a paleontological resource.	S	LS	S	LS
Impact 4.12.5: Implementation of the proposed project, combined with other projects could result in the loss or destruction of historical architectural resources.	S	SU	S	SU
Impact 4.12.6: Implementation of the proposed project, combined with other projects could result in the loss of destruction of archaeological and/or paleontological resources.	S	LS	S	LS

SU = Significant and Unavoidable Impact
S = Significant Impact
LS = Less than Significant Impact
NA = Not Applicable

The impacts and mitigation measures identified in this section address types of activities that could significantly impact cultural resources including archaeological sites and historic buildings and structures. The proposed plan includes construction and operation of proposed project facilities which would result in earth moving or demolition activities. Actions that would not result in earthmoving activities or changes to historic structures would not result in impacts to cultural resources (e.g. water conservation measures) are not analyzed further in this document. Individual proposed projects that could be implemented under the future project elements that include these

types of activities would be required to implement the identified mitigation measures in an effort to reduce any impacts to a less-than-significant level.

Identification of specific impacts and mitigation measures that are appropriate for a specific proposed project would depend on both the nature of the cultural resources that are present and on the nature of the proposed project. In some instances, mitigation measures must be developed in consultation with multiple agencies and other interested parties.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if implementation of the proposed project would:

- Cause a substantial adverse change in the significance of a historical resource that is either listed or eligible for listing in the National Register, the California Register, or a local register of historic resources;
- Cause a substantial adverse change in the significance of a unique archaeological resource;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

CEQA provides that a project may cause a significant environmental effect where the project could result in a substantial adverse change in the significance of a historical resource (PRC, Section 21084.1). *CEQA Guidelines* section 15064.5 defines a "substantial adverse change" in the significance of a historical resource to mean physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be "materially impaired" (*CEQA Guidelines*, section 15064.5[b][1]).

CEQA Guidelines, section 15064.5(b)(2), defines "materially impaired" for purposes of the definition of "substantial adverse change" as follows:

The significance of a historical resource is materially impaired when a project:

- Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or
- Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of PRC Section 5024.1(g), unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA.

In accordance with *CEQA Guidelines* section 15064.5(b)(3), a project that follows the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* or *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* is considered to have mitigated impacts to historic resources to a less-than-significant level.

Historic resources are usually 50 years old or older and must meet at least one of the criteria for listing in the California Register (such as association with historical events, important people, or architectural significance), in addition to maintaining a sufficient level of physical integrity (*CEQA Guidelines* section 15064.5[a][3]).

Impacts and Mitigation Measures

Impact 4.12.1 Implementation of the proposed project could adversely impact historic architectural resources directly through demolition or substantial alteration, or indirectly through changes to historical setting. (Significant)

Near-Term Project Elements

Archival review of the proposed near-term project elements identified five previously documented cultural resources intersecting or adjacent to the transmission pipelines. Four of these resources date to the historic period, and two are identified as either eligible for the California Register and local registers (1333-1353 N Palm Bungalow Court), or listed on the local register (Golden State Boulevard Bridge Railway [Caltrans Bridge # 42C0084]). Both of these resources are located along the near-term transmission pipelines. Construction of the proposed transmission pipeline would occur within the road ROW and would not result in an adverse impact to either the railway bridge or bungalow court. Field survey identified the Mill Ditch/Fresno Canal within the boundaries of Conveyance Option 1. As described above, portions of the access road project area along the Mill Ditch and Fresno Canal were unable to be surveyed due to lack of access. Survey of these areas could identify previously undocumented resources; therefore, this is considered a potentially significant impact for Conveyance Option 1. ESA staff identified no cultural resources within the boundaries of Conveyance Option 2.

Archival review identified no previously recorded eligible resources along or intersecting Conveyance Option 1 or within the footprint of the existing NE SWTF or proposed SE SWTF. Field survey identified no additional historical resources within the footprint of the existing NE SWTF, proposed SE SWTF, or transmission pipelines.

Future Project Elements

Within the Metro Plan Update Area, numerous historic buildings and structures have been identified as dating to 50 years or older. In addition, 85 resources were identified in the proposed project area as listed either in the California Register, National Register, California State Historic Landmarks, or the California Point of Historic Interest. The City of Fresno also maintains a Local Register of Historic Resources, containing 271 existing properties, including the Old Fresno Water Tower and the Kearney Boulevard Gateway. The proposed Metro Plan Update future project elements includes the construction of water facilities throughout the City SOI and Fresno County,

including water treatment and conveyance facilities, water storage facilities, and groundwater facilities. Although water conveyance pipelines would be primarily constructed within streets or other existing rights-of-way, and therefore would have a reduced potential to demolish or substantially alter significant historic resources, other facilities such as water treatment facilitates, groundwater wells and recharge basins, and pump stations would have a greater potential to adversely impact historic resources.

Implementation of the proposed future project elements could result in potentially significant impacts to historic architectural resources on a proposed project basis. Historic architectural resources may be impacted both directly by demolition or relocation of structures, or indirectly through significant changes in the historical setting of buildings. Demolition or substantial alteration of historically significant buildings or their immediate setting is considered to be a significant impact to the environment.

Summary

Construction of proposed project facilities could include either demolition or alteration of currently unevaluated historic architectural resources. Conveyance Option 1 includes improvements to the 125 year old Mill Ditch and Fresno Canal. In the event that this resource is determined eligible for listing in local, state, or federal registers, alterations inconsistent with the Secretary of Interior Standards would result in an adverse change to the resource, potentially hindering its ability to convey its historic significance. Locations and designs for future project actions are currently undetermined, and if avoidance is infeasible this would subsequently have the potential to impact significant historic architectural resources. Therefore, this is considered a significant impact.

Mitigation Measures

If avoidance of historically significant resources is feasible, or alteration or structures can be conducted adhering to the Secretary of Interior Standards, then implementation of mitigation measures 4.12.1a and 4.12.1b would reduce impacts to a less than significant level. However, if avoidance is not feasible, then the recordation of a building or structure to Historic American Building Surveys (HABS) and Historic American Engineering Record (HAER) standards and public interpretation efforts would reduce impacts on significant historic buildings and structures, but such efforts typically do not reduce them to a less-than-significant level (CEQA section 15126.4(b)(2) and this impact would remain significant and unavoidable**.**

> **Measure 4.12.1a (NT):** Prior to construction of Conveyance Option 1, cultural resource surveys covering the remaining portions of the year-round maintenance access road along the Mill Ditch/Fresno Canal shall be completed and the findings documented. Mill Ditch/Fresno Canal shall be evaluated for its eligibility for listing in the National, California, and Fresno Registers. The evaluation shall be carried out by a qualified archaeologist and historian or architectural historian meeting the Secretary of the Interior's Standards. In the event that the canal is determined eligible for listing in the federal, state, or local registers, mitigation shall be recommended to minimize impacts to the canal. If

avoidance of impacts is deemed infeasible, the City shall implement Mitigation Measure 4.12.1c.

Measure 4.12.1b (NT/F): All areas slated for development or other ground-disturbing activities in the project area that contain structures 45 years old or older shall be surveyed and evaluated for their potential historic significance on a project-specific basis prior to approval of project plans. The survey shall be carried out by a qualified historian or architectural historian meeting the Secretary of the Interior's Standards for Architectural History. Demolition or substantial alteration of all previously recorded historic resources, including significant historic resources are encountered during the survey and evaluation efforts, shall be avoided. Any alterations, including relocation, to historic buildings or structures shall conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (NPS, 1995). If avoidance of identified historic resources is deemed infeasible, the City shall implement Mitigation Measure 4.12.1c.

Measure 4.12.1c (NT/F): If avoidance or relocation of an historic resource is determined infeasible, a qualified architectural historian shall be retained to document the affected historic resource in accordance with the National Park Service's Historic American Buildings Survey (HABS) and/or Historic American Engineering Record (HAER) standards. Such standards typically include large format photography using (4x5) negatives, written data, and copies of original plans if available. The HABS/HAER documentation packages shall be archived at local libraries and historical repositories the Southern San Joaquin Valley Information Center of the California Historical Resources Information System, and in the City of Fresno's Historic Preservation archives. Public interpretation of historic resources at their original site shall also occur in the form of a plaque, kiosk or other method of describing the building's historic or architectural importance to the general public.

Significance After Mitigation: Significant and Unavoidable

Impact 4.12.2: Implementation of the proposed project could result in damage or destruction of known or previously unidentified archeological resources. (Significant)

Near-Term Project Elements

In the vicinity of the Conveyance Option 1 alignment, one previously identified prehistoric period archaeological resource was identified: a prehistoric scatter of stone tools and debris. No other prehistoric or historic period archaeological resources were identified during the archival review. As described under Impact 4.12-1, portions of the alignment of Option 1 could not be surveyed due to lack of access. Earthmoving activities, including site grading and excavation for the construction of foundations associated the SE SWTF and transmission pipelines could potentially result in damage or destruction of known or previously unidentified archaeological resources. This could occur even in already developed areas, as older buildings, structures, and roadways are known to have been built on top of or within archaeological deposits.

Future Project Elements

The proposed Metro Plan Update includes the construction of water storage and treatment facilities and associated pipelines and groundwater storage basins throughout the City SOI. As described above, earthmoving activities, including site grading and excavation could potentially result in damage or destruction of known or previously unidentified archaeological resources. This could occur even in already developed areas, as older buildings, structures, and roadways are known to have been built on top of or within archaeological deposits.

Summary

Construction of proposed project facilities could include earth moving activities that have the potential to result in a significant impact to previously undiscovered archaeological resources. Additionally, implementation of Conveyance Option 1 has the potential to adversely affect a known prehistoric site located along the Mill Ditch/Fresno Canal. This is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level because project areas would be surveyed for the presence of archeological resources and if resources are uncovered, they would be managed consistent with regulatory requirements. Furthermore, construction workers would be trained on what to look for in the event that earthmoving activities uncovered a previously unidentified resource.

> **Measure 4.12.2a (NT/F):** All areas slated for development or other ground-disturbing activities shall be subject to a Phase I survey (including records search and archaeological survey) for archaeological resources on a project-specific basis prior to approval of proposed project plans. The survey shall be carried out by a qualified archaeologist in consultation with local Native American groups. If potentially significant archaeological resources are encountered during the survey, the City shall require that the resources are evaluated for their eligibility for listing on the National Register or the California Register, and that recommendations are made for treatment of these resources if found to be significant, in consultation with the appropriate Native American groups. All previously recorded prehistoric and historic-period archaeological resources, as well as any significant resources identified as a result of the survey, shall be avoided. Ground-disturbing activity in areas determined to be sensitive for cultural resources shall be monitored by a qualified archaeologist and Native American representative.
>
> **Measure 4.12.2b (NT/F):** Prior to construction a worker training program shall be implemented to inform all personnel involved with earthmoving activities the potential for prehistoric and historic-period subsurface archaeological resources to be uncovered and/or disturbed by proposed project-related earth moving; where such remains are most likely to be encountered during earth moving; and procedures to be employed if archaeological resources are discovered during excavations.
>
> **Measure 4.12.2c (NT/F):** During construction, should prehistoric or historic-period subsurface cultural resources be discovered, all activity in the vicinity of the find shall stop and a Secretary of the Interior qualified archaeologist will be contacted to assess the

significance of the find according to *CEQA Guidelines* section 15064.5. If any find is determined to be significant, the proposed project proponent and the archaeologist will determine, in consultation with local Native American groups, appropriate avoidance measures or other appropriate mitigation. All significant cultural materials recovered may be, as necessary and at the discretion of the consulting archaeologist and in consultation with local Native American groups, subject to scientific analysis, professional museum duration, and documentation according to current professional standards.

Significance After Mitigation: Less than Significant

Impact 4.12.3: Ground-disturbing activities associated with construction of the proposed project could result in damage to previously unidentified human remains. (Significant)

Near-Term and Future Project Elements

There is no indication that any particular site in the proposed project area has been used for human burial purposes in the recent or distant past. In addition, General Plan Policy G-11-d already protects previously unidentified human remains from accidental damage. However, if during earth disturbing activities human remains are discovered, including those interred outside of formal cemeteries, the human remains could be inadvertently damaged, which is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level. In the event of accidental discovery of human remains, adherence to NAHC practices and other public codes would result in a less than significant impact to human remains.

Measure 4.12.3a (NT/F): If human skeletal remains are uncovered during proposed project construction, work in the vicinity of the find shall cease and the Fresno County coroner will be contacted to evaluate the remains, following the procedures and protocols set forth in section 15064.5 (e)(1) of the *CEQA Guidelines*. If the County coroner determines that the remains are Native American, the proposed project proponent will contact the Native American Heritage Commission, in accordance with Health and Safety Code Section 7050.5, subdivision (c), and Public Resources Code 5097.98 (as amended by AB 2641) and the Most Likely Descendant will be identified. The Most Likely Descendant will make recommendations for the treatment of any human remains.

Significance After Mitigation: Less than Significant

Impact 4.12.4: Ground-disturbing construction associated with implementation of the proposed project could result in disturbance or destruction of a paleontological resource. (Significant)

Near-term and Future Project Elements

As discussed in the setting, disturbed soils, artificial fills, and recent floodplain deposits exist within approximately six feet of the ground surface and have a low paleontological potential. Such materials are unlikely to yield significant fossil resources, and excavation within surficial deposits is not likely to be fossil-yielding. Beneath the surficial materials lie Pleistocene deposits (Modesto, Riverbank and Turlock Fms.) that are known to have a high fossil-yielding potential. For this reason, excavations required for certain facilities associated with the project could disturb or destroy significant paleontological resources. This includes all project-related facilities that require excavations that extend beyond 6 feet in depth. Earthmoving activities, including site grading and excavation for the construction of foundations associated the SE SWTF, transmission pipelines, and groundwater recharge basins could potentially result in damage or destruction of known or previously unidentified paleontological resources. This is considered a significant impact.

Mitigation Measures

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level. General Plan Policy G-11 and G-12 protects previously identified non-human fossils from accidental damage. It requires that work be stopped and a qualified paleontologist be contacted should a fossil be encountered during construction excavations. To ensure that paleontological resources are protected, Mitigation Measure 4.12-4 provides two mitigation strategies to reduce potential impacts to a less than significant level, based on the actual probability of disturbing unique or significant fossils. Excavation within areas unlikely to yield fossils would employ accidental or unanticipated discovery measures, which requires work to stop when a potentially significant fossil is encountered; whereas excavation in *in-situ* geology with a high potential to disturb paleontological resources would implement a comprehensive mitigation and monitoring program.

> **Measure 4.12.4a (NT/F):** If paleontological resources, such as fossilized bone, teeth, shell, tracks, trails, casts, molds, or impressions are discovered during ground-disturbing activities, all ground disturbing activities within 50 feet of the find shall be halted until a qualified paleontologist can assess the significance of the find and, if necessary, develop appropriate salvage measures in consultation with the City of Fresno and in conformance with Society of Vertebrate Paleontology Guidelines (SVP, 1995; SVP, 1996).
>
> **Measure 4.12.4b (NT/F):** Prior to all Master Plan facilities involving excavations greater than 6 feet in depth (including pipeline crossings and groundwater recharge basins), the City of Fresno shall retain a qualified paleontologist to design a monitoring and mitigation program. The paleontological resource monitoring and mitigation program should include:
>
> - A worker training program to inform all personnel involved with earthmoving activities the potential for fossil remains being uncovered and/or disturbed by proposed project-related earth moving; where such remains are most likely to be

encountered during earth moving; and procedures to be employed if fossil remains are discovered during excavations.

- Preconstruction coordination with appropriate agencies, and identification of an institution willing and able to accept fossil specimens collected during the mitigation program. The institution shall serve as an information repository over the course of the proposed project.
- A schedule and plan for monitoring earth-moving activities, and a provision that monitoring personnel have the authority to halt construction activities should a potential fossil-find be unearthed.
- Emergency discovery procedures, including survey and record keeping of fossil-finds, bulk sediment sample collection and processing, specimen identification, disposition, or museum curation of any specimens and data recovered.
- Monitoring and data recovery activities shall be documented in daily monitoring reports, as well as a final mitigation monitoring report at the completion of construction activities, which shall be submitted to the City of Fresno.

Implementation of the mitigation program and data recovery shall occur in accordance with SVP standards (SVP, 1995; SVP, 1996).

Significance After Mitigation: Less than Significant

The cumulative context for cultural resources impacts includes the City of Fresno and the southern Central Valley.

Impact 4.12.5: Implementation of the proposed project, combined with other projects could result in the loss or destruction of historical architectural resources. (Significant)

Near-term and Future Project Elements

Demolition of historic structures associated with the proposed project and other projects could contribute to the progressive loss of historic architectural resources as well as the setting and integrity of historic districts in the City of Fresno and the southern Central Valley. This would be a significant cumulative impact. Construction of proposed project facilities could include either demolition or alteration of currently unevaluated historic architectural resources. Conveyance Option 1 includes improvements to the 125 year old Mill Ditch and Fresno Canal. In the event that this resource is determined eligible for listing in local, state, or federal registers, alterations inconsistent with the Secretary of Interior Standards would result in an adverse change to the resource, potentially hindering its ability to convey its historic significance. Installation of proposed project conveyance pipelines would primarily be installed within streets or other existing rights-of-way, and therefore would have limited potential to result in the demolition or modification of a historic architectural resource. However, construction of other proposed project facilities could potentially be sited on properties that contain historic architectural resources. Therefore, the proposed project's contribution to this significant cumulative impact would be considerable.

Mitigation Measures

Implementation of the following mitigation measures would reduce the proposed project's contribution to this significant cumulative impact but not to a less than considerable level; therefore, this cumulative impact would remain significant and unavoidable.

Measure 4.12.5 (NT/F): Implement Mitigation Measure 4.12.1.

Significance After Mitigation: Significant and Unavoidable

Impact 4.12.6: Implementation of the proposed project, combined with other projects could result in the loss or destruction of archaeological and/or paleontological resources. (Significant)

Near-term and Future Project Elements

Construction activities, including those associated with proposed project could contribute to the progressive loss of cultural resources or paleontological resources and result in *significant* cumulative impacts. The project's contribution to this cumulative impact would be considerable due to the amount of earth disturbing activities associated with project construction.

Mitigation Measures

Implementation of the following mitigation measures would reduce the proposed project's contribution to less than considerable and this cumulative impact would be less-than-significant.

Measure 4.12.5 (NT/F): Implement Mitigation Measures 4.12.2, 4.12.3, and 4.12.4.

Significance After Mitigation: Less than Significant

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CHAPTER 5
Other CEQA Considerations

5.1 Cumulative Impacts

This section provides a discussion of CEQA analysis requirements for assessment of cumulative impacts and summarizes the cumulative impacts assessment included in the technical sections of Chapter 4. For example, the assessment of potential cumulative effects associated with greenhouse gases is located in Section 4.7 Air Quality and Climate Change.

The CEQA Guidelines require that an EIR assess the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable." CEQA requires that an EIR assess the cumulative impacts of a project with respect to past, current, and probable future projects within the region. *CEQA Guidelines* (section 15355) define cumulative effects as "two or more individual effects that, when considered together, are considerable or which compound or increase other environmental impacts. According to CEQA Guidelines section 15130 (b), the purpose of the cumulative impacts discussion shall reflect "the severity of the impacts and their likelihood of occurrence" and shall "be guided by the standards of practicality and reasonableness." The CEQA Guidelines further indicate that the discussion of cumulative impacts should include:

- Either: (A), a list of past, present, and probable future projects producing related or cumulative impacts; or (B), a summary of projections contained in an adopted general plan or similar document, or in an adopted or certified environmental document, which described or evaluated conditions contributing to a cumulative impact;
- A discussion of the geographic scope of the area affected by the cumulative effect;
- A summary of expected environmental effects to be produced by these projects; and,
- Reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

This cumulative analysis relies on the Fresno 2025 General Plan (City of Fresno 2002a) and its certified Master EIR (City of Fresno 2002b), which previously described and evaluated conditions contributing to cumulative impacts. A "list approach" was not used because the proposed project assessed within this Program EIR is not sufficiently defined to characterize future individual, site-specific facilities or their potential effects.

5.1.1 Cumulative Context

Geographically, the proposed project area is the City of Fresno and its SOI, including Fresno County lands located in or adjacent to the SOI, as shown in Figure 3-2. However, for cumulative and other environmental impacts the cumulative context varies, depending upon the issue area discussed and the geographic extent of the potential impact. For example, the cumulative context associated with construction noise impacts is limited to areas in the vicinity of construction sites, whereas the cumulative context for construction-related air emissions would be the San Joaquin Valley Air Basin.

5.1.2 Project Timing

In addition to the geographic scope, cumulative impacts must also take into consideration the timing of related projects relative to the proposed project. The estimated implementation schedule for both near-term and future projects of the proposed Metro Plan Update is shown in Table 3-11 and is estimated to occur over a 10 year period between 2015 and 2025. The timing of the individual infrastructure components of the Metro Plan Update will ultimately depend on the need for additional water supply capacity and the availability of funding.

5.1.3 Summary of Cumulative Impacts

The cumulative impacts of the proposed project are identified and discussed in the technical sections of Chapter 4. The following is a summary of the cumulative impacts and their level of significance after implementation of mitigation measures. For a complete discussion of cumulative impacts please refer to Sections 4.2 through 4.12.

Section 4.2 Land Use and Agricultural Resources

The cumulative context for land use and agricultural resources includes the City of Fresno SOI and Fresno County.

Impact 4.2.5: Implementation of the proposed project, when combined with development of other future projects, could make a cumulatively considerable contribution resulting in adverse impacts on agricultural resources. (Less than Significant)

Section 4.3 Geology and Soils

The cumulative context for geology and soils would be proposed project sites and their immediate geographic area that could be affected by construction and operation of proposed project facilities.

Impact 4.3.4: Implementation of the proposed project, in combination with other development projects, could increase the risk of damage to structures due to seismically induced groundshaking and unstable soil conditions. (Less than Significant)

Section 4.4 Hydrology and Water Quality

The cumulative context for cumulative hydrology and water quality resource impacts is the Kings Subbasin of the San Joaquin Valley Groundwater Basin. Because the proposed project involves groundwater recharge, it is anticipated that it would not make a considerable contribution to a potential loss of groundwater recharge potential and would not lower groundwater levels.

Impact 4.4.6: Implementation of the proposed project, when combined with construction and operation of other future projects, could adversely affect surface and groundwater quality. (Less than Significant)

Impact 4.4.7: Implementation of the proposed project, when combined with implementation of other future projects, could increase rates of stormwater runoff that could exceed drainage system capacity. (Less than Significant)

Impact 4.4.8: Implementation of the proposed project, when combined with implementation of other future projects, could cumulatively contribute to increased flood elevations or redirecting or impeding flood flows increasing the risk of damage associated with flooding. (Less than Significant)

Section 4.5 Biological Resources

The cumulative context for biological resources impacts includes the City of Fresno, its SOI, and the southern Central Valley.

Impact 4.5.12: Implementation of the proposed project, when combined with development of other future projects, could contribute to the cumulative loss or degradation of habitat or species protected under Federal, State and local regulations. (Significant)

Implementation of Mitigation Measures 4.5.1 through 4.5.11 would reduce the project's contribution to less than considerable because surveys would be conducted to prior to construction activities and additional protection measures would be implemented to avoid, reduce, and/or replace protected or sensitive biological resources in the work area if they are present. Therefore, this cumulative impact would be less than significant.

Section 4.6 Transportation

Impact 4.6.6 Under Cumulative (2035) Plus Project Conditions without the McKinley Road realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways. (Significant)

Impact 4.6.7 Under Cumulative (2035) Plus Project Conditions with the McKinley Avenue realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways. (Significant)

Implementation of Mitigation Measures for Impact 4.6.6 and 4.6.7, which includes installation of new traffic signals, road segment improvements, and payment of the City of Fresno's TSMI and

FMSI fees, would reduce project- related impacts to adversely affected intersections and road segments to a less-than-significant level. However, although payment of a fair share contribution to improvements is considered a feasible approach for mitigating project impacts, the timing of programmed improvements may not coincide with the timing of proposed project improvements and implementation of programmed improvements is outside of the City of Fresno's jurisdiction to construct. As a result, this impact would remain significant and unavoidable**.**

Impact 4.6.8: Construction of the proposed project, in combination with construction projects could temporarily increase traffic congestion, result in short-term traffic delays, and create traffic hazards (Significant).

Implementation Mitigation Measure 4.6.1 would reduce the proposed project's contribution to short term traffic congestion, traffic delays, and traffic hazards to less than considerable by requiring that the City coordinate with the appropriate local government departments, and with utility districts and agencies regarding the timing of construction activities. In addition, project contractors would be required to obtain roadway encroachment permits and to develop and implement traffic control plans. Therefore, this cumulative impact would be less than significant.

Section 4.7 Air Quality and Climate Change

The cumulative context for air quality impacts is the San Joaquin Valley air basin.

Impact 4.7.5: Construction and operation of the project could result in a cumulatively considerable increase in greenhouse gas emissions. (Less than Significant)

Impact 4.7.6: Construction of proposed project facilities, when combined other development projects in the San Joaquin Valley air basin, would result in cumulative air quality impacts. (Significant)

Implementation of the following mitigation measures would reduce the fugitive dust and NO_x emissions from construction. Though the project would comply with Rule 9510, NO_x emissions would still be significant therefore the projects construction emissions would remain significant and unavoidable.

Impact 4.7.7: Operation of proposed project facilities, when combined with other development projects in the San Joaquin Valley air basin, would result in cumulative air quality impacts. (Less than Significant)

Section 4.8 Noise

The cumulative context for noise impacts would be construction and operation of projects in and adjacent to the City's SOI that could affect the same sensitive receptors as proposed project facilities.

Impact 4.8.5: Construction of proposed project facilities, when combined with construction of other future projects, could increase noise levels at nearby sensitive receptor locations. (Significant)

Implementation of Mitigation Measures 4.8.1 and 4.8.2 would reduce the proposed project's contribution to less than considerable because it would restrict construction activities to daytime hours and impose measures to reduce noise associated with ground vibration when activities are to occur adjacent to sensitive receptors. Therefore, this cumulative impact would be less than significant.

Impact 4.8.6: Operation of proposed project facilities, when combined with operation of other future projects, could increase noise levels at nearby sensitive receptor locations. (Less than Significant)

Section 4.9 Hazards and Hazardous Materials

The cumulative context for hazards and hazardous materials is projects that could result in an increased risk of exposure due to the release of hazardous materials in the City's SOI and Fresno County.

Impact 4.9.7: Implementation of the proposed project could contribute to cumulative impacts associated with release of hazardous materials or other hazards. (Less than Significant)

Section 4.10 Public Services and Utilities

The cumulative context would be the service areas of the various service and utility providers.

Impact 4.10.7: Implementation of the proposed project, in combination with other projects, could cumulative increase demands public services and utilities. (Less than Significant)

Impact 4.10.8: Construction of the proposed project, in combination with other projects, could result in temporary interference or disruption of utility service. (Significant)

Implementation of Mitigation Measure 4.10.6 would reduce the project's contribution to less than considerable by ensuring there would be no disruption to existing utility service and this cumulative impact would be less than significant.

Section 4.11 Aesthetics

The geographic scope of potential cumulative impacts to visual quality is the local viewsheds that could be affected by the proposed project facilities as viewed from public roadways, existing neighborhoods and planned mixed use areas.

Impact 4.11.4: Implementation of the proposed project could make a cumulatively considerable contribution to adverse effects on the visual/aesthetic resources of local viewsheds in the project area. (Significant)

City of Fresno General Plan Objective C-20 states "As part of the city's project review process, major emphasis will be given to site and building design in order to preserve functionality and community aesthetics." While proposed project facilities would be guided by the General Plan, implementation of Mitigation Measures 4.11.2 and 4.11.3 would minimize the proposed project's

contribution to aesthetic and light and glare impacts to less than considerable; therefore, this cumulative impact would be less than significant.

Section 4.12 Cultural Resources

The cumulative context for cultural resources impacts includes the City of Fresno and the southern Central Valley.

Impact 4.12.5: Implementation of the proposed project, combined with other projects could result in the loss or destruction of historical architectural resources. (Significant)

If avoidance of historically significant resources is feasible, or alteration or structures can be conducted adhering to the Secretary of Interior Standards, then implementation of Mitigation Measure 4.12.1would reduce the proposed project's contribution to this significant cumulative impact to a less than considerable level. However, if avoidance is not feasible, then the recordation of a building or structure to HABS/HAER standards and public interpretation efforts would reduce impacts on significant historic buildings and structures, but such efforts typically do not reduce them to a less-than-significant level; therefore, this cumulative impact would remain significant and unavoidable.

Impact 4.12.6: Implementation of the proposed project, combined with other projects could result in the loss or destruction of archaeological and/or paleontological resources. (Significant)

Implementation of Mitigation Measures 4.12.2, 4.12.3 and 4.12.4 would reduce the proposed project's contribution to less than considerable because previously unidentified cultural resources would be managed consistent with regulatory requirements. Therefore, this cumulative impact would be less than significant.

5.2 Growth Inducing Impacts

The CEQA *Guidelines* require that an EIR evaluate the growth inducing impacts of a proposed project (section 15126.2[d]). A growth-inducing impact is defined by the CEQA *Guidelines* as:

> *Discuss the way in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

A project can have direct and/or indirect growth inducement potential. Direct growth inducement would result if a project resulted in establishing a new demand for public services, facilities, or

infrastructure, such as construction of new housing. A project can have indirect or secondary growth-inducement potential if it would establish substantial new permanent employment opportunities (e.g., commercial, industrial or governmental enterprises) or if it would involve a substantial construction effort with substantial short-term employment opportunities and indirectly stimulate the need for additional housing and services to support the new employment demand. Similarly, as explained in the CEQA *Guidelines*, a project would indirectly induce growth if it would remove an obstacle to additional growth and development, such as removing a constraint or increasing the capacity of a required public service, such as increased water supply capacity.

Water supply is one of the primary (although not the only) public service needed to support growth in the Fresno metropolitan area. The availability of wastewater treatment capacity, public schools, and transportation services would also influence growth in the planning area. Economic factors, in particular, greatly affect development rates and locations.

5.2.1 Method of Analysis

As identified in CEQA (section 15126.2(d)) growth inducement is not in and of itself an "environmental impact", however growth can result in adverse environmental consequences. Growth inducement may constitute an adverse impact if the growth is not consistent with or accommodated by the land use plans and policies for the affected area. Local land use plans, typically general plans, provide for land use development patterns and growth policies that allow for the "orderly" expansion of urban development supported by adequate urban public services, such as water supply, sewer service, and new roadway infrastructure. A project that would induce "disorderly" growth (i.e., a project in conflict with local land use plans) could indirectly cause adverse environmental impacts, for example, loss of agricultural land that has not been addressed in the planning process. To assess whether a project with the potential to induce growth is expected to result in significant impacts, it is important to assess the degree to which the growth associated with a project would or would not be consistent with applicable land use plans.

To determine direct growth inducement potential, the proposed project was evaluated to verify whether an increase in population or employment, or the construction of new housing would occur as a direct result of the project.

To determine indirect growth inducement potential, the proposed project was reviewed to ascertain whether it would remove an obstacle to growth, such as removing a constraint on a required public service. In order to assess this, the proposed project was reviewed in relation to population projections developed by the City of Fresno Economic Development Division and buildout under the approved Fresno 2025 General Plan. While growth may be consistent with local planning policies, it could still promote secondary effects to the local environment. Secondary effects of growth include increased demand on other community and public services and infrastructure, increased traffic and noise, degradation of air and water quality, degradation or loss of plant and animal habitats, and conversion of agricultural and open space land to developed uses. To determine the secondary effects of growth, the Fresno 2025 General Plan EIR was reviewed to determine if any secondary effects of planned growth were identified and if any secondary effects were considered significant and unavoidable impacts.

5.2.2 Population Projections

As of April, 2010, the City of Fresno had a population of 494,665 persons, as reported by the 2010 U.S. Census Bureau. Population projections for the City are based on estimates prepared by the Fresno Council of Governments (Fresno COG). Table 5-1 shows the actual population for the City of Fresno from 1990 to 2010 (based on Census data, as reported by the California Department of Finance), and the projected population through 2035 based on Fresno COG projections.

TABLE 5-1
POPULATION PROJECTIONS

Location	1990	2000	2010	2015	2020	2025	2030	2035
City of Fresno	354,091	427,652	494,665	547,466	599,271	655,979	718,052	786,000

SOURCES: 1990, 2000 data: State of California, Department of Finance, E-4 *Historical Population Estimates for City, County and the State, 1991-2000, with 1990 and 2000 Census Counts.* Sacramento, California, August 2007.
2010 data: State of California, Department of Finance*, E-4 Population Estimates for Cities, Counties, and the State, 2001-2010, with 2000 & 2010 Census Counts.* Sacramento, California, November 2012.
2015 to 2035 Projections: Based on Fresno Council of Governments 2035 Projection for Fresno County (1,290,000), with 61 percent of that population being in the City of Fresno (reference: Fresno General Plan and Development Code Update, Alternatives Report, prepared by City of Fresno, et. Al., March 2012).

5.2.3 Growth Inducement Potential

As indicated in the Methodology discussion, growth inducement could result in adverse impacts if the growth is not consistent with land use and growth management plans and policies for the proposed project area. The proposed project has been developed based upon the geographic area and land uses (see Figure 3-2), population and land uses policies of the adopted Fresno 2025 General Plan. The City is in process of updating the General Plan (2035 General Plan Update). The proposed project area for the Metro Plan Update includes the existing city limits and the City of Fresno SOI designated by the adopted 2025 General Plan. The boundaries designated by the proposed 2035 General Plan Update are consistent with those adopted in the 2025 General Plan; therefore, the proposed project area would not change. The City of Fresno has developed the proposed Metro Plan Update and EIR to be consistent with the 2025 General Plan. Because the proposed project is consistent with the adopted Fresno 2025 General Plan, it would not induce "disorderly" growth that is in conflict with local land use plans, and would not indirectly cause additional adverse environmental impacts to other public services.

The Metro Plan Update proposes a comprehensive and integrated water supply plan to address groundwater basin overdraft and water quality concerns, diversify the City's water supply portfolio, and enhance overall water supply reliability to meet the demands of existing and future customers through buildout of the adopted general plan in effect at the time of approval of the EIR. New water supply facilities are proposed for all of the water supply components – treated surface water facilities, water transmission mains and distribution pipelines, groundwater wells, groundwater recharge basins, recycled water facilities, plus facilities to implement demand management measures such as modification of landscapes to conserve water. Facility construction would be phased based upon what is needed in the near-term and what is to be

completed for 2025 General Plan buildout. Because the proposed project is limited to the planning and implementation of water supply treatment, transmission and storage facilities, as opposed to construction of housing and commercial development that would directly affect the number of residents or employees within the area. Implementation of the proposed project would include relocation of existing City of Fresno Water Division administrative and corporation yard uses and associated employees to the proposed new SE SWTF. In addition, new SWTFs would involve a small number of new employees. Because the number of new employees would be limited, the proposed project would not directly contribute to the creation of additional housing or jobs within the City of Fresno and therefore would directly induce growth.

The proposed project would not directly or indirectly induce growth or remove an obstacle to growth, since the increased population would occur based on the City's approved General Plan and development policies. Implementation of the Metro Plan Update would result in the diversification the City's water supply portfolio, and enhancement of overall water supply reliability to meet the demands of existing and future customers through buildout of the adopted general plan and would not meet a demand greater than what has been approved as part of the Fresno 2025 General Plan.

5.2.4 Secondary Effects of Growth

Impacts which have been identified as significant and unavoidable in the General Plan EIR (City of Fresno, 2002b) are increased traffic and circulation; degradation of air quality; potential disturbance of cultural resources; loss of productive agricultural resources, and generation of noise. Implementation of the proposed project would not result in a direct or indirect increase in population or employment; therefore, it would not result in additional secondary effects beyond those identified in the General Plan EIR, which has been adopted and approved with the local lead agency adopting a statement of overriding consideration for its significant unavoidable effects.

5.3 Significant Irreversible Environmental Changes

The CEQA Guidelines (section 15126.2[c]) require an evaluation of the significant irreversible environmental changes that would be caused by a project if implemented, as described below:

> *Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse there after unlikely. Primary impacts, and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.*

In general, the CEQA Guidelines refer to the need to evaluate and justify the consumption of nonrenewable resources and the extent to which the project commits future generations to similar uses of nonrenewable resources. In addition, CEQA requires that irreversible damage resulting from an environmental accident associated with the project be evaluated.

Implementation of the proposed project would indirectly result in the commitment of nonrenewable natural resources used in the construction process; gravel, petroleum products, steel, and other materials. The proposed project would also result in the commitment of slowly renewable resources, such as wood products. Operation of the proposed project would also result in commitment of energy resources such as fossil fuels, electricity, and chemicals used within the water treatment process. However, the amount of nonrenewable energy resources required to serve the proposed project would be limited. Compliance with all applicable building codes, as well as mitigation measures, planning policies, and standard conservation features would ensue that natural resources are conserved to the maximum extent possible. It is assumed that the rate and amount of energy consumption would not result in the unnecessary, inefficient or wasteful use of resources and would be accomplished in a manner consistent with applicable laws and regulations. The Metro Plan Update proposes on-site generation of renewable power at the SE SWTF through the use of photovoltaic panels and/or hydro turbines to offset the average energy use by proposed pretreatment, ozone generation, filtration, chemical addition, and dewatering processes as well as the offices and other administrative facilities. It is also possible that new technologies or systems will emerge, or will become more cost-effective or user-friendly, to further reduce the reliance on nonrenewable natural resources.

5.4 Significant Unavoidable Impacts

Public Resources Code Section 21100(b) (2) requires that any significant effect on the environment that cannot be avoided be identified. Additionally, CEQA section 15093(a) allows the lead agency to determine that the benefits of a proposed project outweigh the unavoidable adverse environmental impacts of implementing the project. Under this rule, the Lead Agency may approve a project with unavoidable adverse impacts if it prepares a "Statement of Overriding Considerations" that sets forth specific reasons for making such a decision.

The following impacts associated with construction and operations of the proposed project have been determined to be significant and unavoidable:

Impact 4.6.6: Under Cumulative (2035) Plus Project Conditions without the McKinley Road realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways.

Impact 4.6.7: Under Cumulative (2035) Plus Project Conditions with the McKinley Avenue realignment, operation of the proposed SE SWTF would contribute to an increase in vehicle trips that could exceed levels of service standards for surrounding roadways.

Impact 4.7.1: Construction activities associated with development of the project would generate short-term emissions of criteria pollutants.

Impact 4.7.6: Construction of proposed project facilities, when combined other development projects in the San Joaquin Valley air basin, would result in cumulative air quality impacts.

Impact 4.12.1: Implementation of the proposed project could adversely impact historic architectural resources directly through demolition or substantial alteration, or indirectly through changes to historic setting.

Impact 4.12.5: Implementation of the proposed project, combined with other projects could result in the loss or destruction of archaeological and/or paleontological resources.

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CHAPTER 6
Alternatives Analysis

6.1 Introduction

Section 15126.6 of the CEQA Guidelines require an evaluation of "a range of reasonable alternatives to the project, or the location of the project, which would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects, and evaluate the comparative merits of the alternatives." The purpose of the alternatives analysis is to determine whether or not a variation of the proposed project would reduce or eliminate significant project impacts in the basic framework of the project's objectives. The alternatives analysis should also discuss the comparative merits of the alternatives. The focus and definition of the alternatives evaluated in this EIR is governed by the "rule of reason" in accordance with section 15126.6(f) of the CEQA Guidelines requiring evaluation of only those alternatives "necessary to permit a reasoned choice." Further, an EIR "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative." The goals and objectives of the proposed project are provided in Section 3, Project Description. The overall objective of the City's Metro Plan Update is to provide sustainable and reliable water supplies to meet the demand of existing and future customers through 2025. The goals are to:

- Optimize the conjunctive use of the City's available surface water, groundwater, and recycled water supplies for direct treatment and use, and intentional groundwater recharge;
- Balance the City's groundwater operations by 2025;
- Replenish groundwater basin storage;
- Continue to implement and expand demand management/water conservation measures in compliance with the City's USBR contract and to achieve specific water conservation goals; and
- Utilize recycled water to meet in-City non-potable demands in new development areas and existing parts of the City.

The project alternatives were analyzed for their ability to meet the basic objectives of the project. Where alternatives were found to attain most of the basic objectives, they were included as part of the detailed analysis presented in this chapter. Where alternatives were not found to attain most of the basic project objectives, they were eliminated from further detailed consideration. The alternatives considered but rejected are discussed in Section 6.2. The alternatives carried forward for analysis are discussed in Section 6.3. The CEQA Guidelines also requires that the "environmentally superior alternative" be identified in the EIR. Section 6.4 identifies the environmentally superior alternative.

6.2 Alternatives Considered but Rejected

Several alternatives were evaluated and screened out (as being impractical and/or causing more environmental impacts than the proposed project), during preparation of the Metro Plan Update and this EIR including: alternate pipeline routes and alternate locations for the SE SWTF; multiple smaller surface water treatment plants located throughout the City (instead of the single 80 mgd SE SWTF); and extensive use of groundwater recharge basins in lieu of constructing the SE SWTF.

The groundwater recharge basin alternative in lieu of constructing the 80 mgd SE SWTF was evaluated and screened out because of several factors:

1. Required recharge basin area: Based on the City's experience with recharge basins, the City anticipates the average recharge capacity to be about 120 acre-feet per acre per year, or approximately 750 acres of new recharge basins would be required to be purchased and maintained by the City in lieu of the 80 mgd SE SWTF. This area is more than 15 times the area required for the SE SWTF.
2. Required location of recharge basins: The City would need to site the 750-acre recharge facility above or near the existing groundwater cone of depression located beneath the City's downtown area for this alternative to have the same beneficial impact to groundwater levels as the SE SWTF. The ability to site a 750-acre recharge basin within the City of Fresno's downtown area is infeasible. Existing development would have to be removed. Therefore, the only alternative would be to locate a 750-acre recharge basin near the western, southern or southwestern City Limit or SOI, where potential areas of this size might be available and acceptable groundwater recharge rates might exist. However, at these locations the hydraulic ability to deliver 89,600 acre-feet (80 mgd) of surface water annually to these recharge basins, the construction and operation of a new well field, and the construction and operation of major new transmission mains, would result in environmental impacts that would be equal to or greater in magnitude to those associated with implementation of the proposed project.

During preparation of the Metro Plan Update, the following criteria was used: (1) use existing City or other public agency property to minimize land purchases; (2) locate pipelines in areas that would optimize water use; (3) minimize utility conflicts, roadways with high traffic volumes, as well as highway and railroad crossings; (4) optimize the use of existing water treatment plants and pipelines; (5) stay within the City's adopted SOI; (6) delivered potable water quality must continue to meet all existing and future California DPH regulations; and (7) optimize existing institutional agreements. During future planning and design phases of the proposed project, refinements to the locations and designs of project facilities could occur before construction, but for the purposes of this EIR, alternative pipeline alignments and alternative locations of facilities has been eliminated from further consideration.

6.3 Alternatives Evaluated in Detail

The following alternatives are being evaluated in detail in this EIR:

- No Project Alternative

- Alternative 1 – Canal/Pipeline Conveyance Option
- Alternative 2 - No Relocation of Water Division Administrative Offices and Corporation Yard

Each of these alternatives is described in more detail and analyzed below.

6.3.1 No Project Alternative

According to section 15126.6(e) of the *CEQA Guidelines*, discussion of the No-Project Alternative must include a description of existing conditions and reasonably-foreseeable future conditions that would exist if the project were not approved. The No Project Alternative would result if the City took no action to build the near- and future-term water supply projects included within the Fresno Metro Plan. Under this alternative, none of the water supply infrastructure proposed as part of the project would be constructed or operated.

Impact Analysis

Under this alternative, none of the proposed near- and future-term water supply facilities would be constructed or operated. As a result, none of the environmental impacts identified in Chapter 4 would occur. Under the No Project Alternative, water demand in the City of Fresno would continue to be met primarily with local groundwater. The groundwater aquifer underlying the Fresno area is currently experiencing severe groundwater level declines and associated groundwater quality issues. Unlike the proposed project, the ongoing dependence on local groundwater resources could further exacerbate existing groundwater level declines and further degrade groundwater quality, resulting in a significant impact not identified with implementation of the proposed project.

Ability to Meet Project Objectives

The No Project Alternative would not meet the overall objective of the City's Metro Plan Update of providing sustainable and reliable water supplies to meet the demand of existing and future customers through 2025. Specifically, this alternative would not meet project objectives of maximizing use of available surface water supplies, balancing the City's groundwater operations or replenishing groundwater storage with surplus surface water because no new surface water distribution, storage and treatment infrastructure would be constructed and no new groundwater recharge facilities would be developed.

6.3.4 Alternative 1 - Canal/Pipeline Conveyance Option

Under Alternative 1, the location of the intake/diversion structure along the Fresno Canal would be shifted west (downstream), approximately seven miles from the proposed location of the intake/diversion structure for Option 2, but upstream of Mudd Creek, along the Fresno Canal. The new diversion would be located at either an existing weir, or a new weir, downstream of the proposed location intake/diversion structure for Option 2, and upstream of Mudd Creek. At this location, a pipeline would be installed along an existing road south to Belmont Avenue and then follow the proposed Conveyance Option 2 alignment west to the proposed SE SWTF. This alternative would potentially reduce the amount of excavation and earthwork required by

shortening the length of the raw water pipeline and eliminating the need for levee and access roadway improvements along the Fresno Canal. All other near-term and future project elements would remain the same as those proposed under the proposed project.

Impact Analysis

Implementation of Alternative 1 would result in similar construction impacts as those associated with the proposed project; however, the magnitude of construction-related impacts would be less because there would be less grading and trenching required to install pipelines with this alternative. Footprint impacts associated with construction of proposed SWTFs and other future project elements would be the same. Even though construction activities would be reduced under this alternative, the amount of potentially significant air quality emissions would still be anticipated to exceed the applicable significance thresholds, resulting in a significant and unavoidable impacts; however, the magnitude of this significant and unavoidable impact would be less when compared to the proposed project. Similar to the proposed project, this alternative would include improvements to the 125 year old Mill Ditch and Fresno Canal. Depending on location, similar to the proposed this could result in a significant and unavoidable impact due to the potential presence of a historic resource.

Operational impacts associated with increased air emissions; noise levels; changes in visual character; and transportation and traffic would be similar to those associated with the proposed project because proposed new SWTFs would still be constructed or modified and new transmission pipelines, storage facilities would be installed. However, these impacts would be less in magnitude because no new levee and access road improvements would be required under this alternative.

Ability to Meet Project Objectives

Implementation of Alternative 1 would meet all of the project objectives. Under this alternative, the size and location of all other facilities, including the proposed new and expanded SWTF's, pipelines, storage tanks, groundwater wells, and groundwater recharge basins would remain unchanged. This would allow for the City to provide sustainable and reliable water supplies to meet the demand of existing and future customers through 2025.

6.3.5 Alternative 2 - No Relocation of Water Division Administrative Offices and Corporation Yard

Under Alternative 2, the existing water division corporation yard facilities would remain at their current location and not be relocated to the proposed SE SWTF site.

Impact Analysis

Implementation of Alternative 2 would result in the similar construction impacts as those associated with the proposed project. Even though existing City administrative and corporation yard uses would not be relocated to the proposed SE SWTF, it is anticipated that the total site acreage (58 acres) would still be prepared for construction (grading and other site preparation

activities) and site disturbance impacts would be the same (of biological and cultural resources). However, because there would be less construction of facilities at the proposed SE SWTF site, impacts associated with use of construction equipment and materials (noise, air emissions, and solid waste production) would be less in magnitude when compared to the proposed project. However, absent the relocation of the Administration and Corporation Yard facilities to the site, modification to existing facilities would require significant demolition, reconfiguration and reconstruction of the existing facilities. Therefore, construction-related impacts could actually be similar in magnitude when compared to the proposed project. Similar to the proposed project, the amount of potentially significant air quality emissions associated with the larger project as a whole would still exceed applicable emissions significance thresholds, resulting in a significant and unavoidable impact; however, the magnitude of this significant and unavoidable impact could be slightly less when compared to the proposed project. Similar to the proposed project, this alternative would include improvements to the 125-year-old Mill Ditch and Fresno Canal. Depending on location, similar to the proposed this could result in a significant and unavoidable impact due to the potential presence of a historic resource.

Implementation of this alternative would eliminate the relocation of employees from the City's existing corporation yard and administration building to the proposed SE SWTF. As a result, this alternative would eliminate new operational trips at the intersections and roadways in the vicinity of the SE SWTF site that would require the need for roadway and intersection improvements as those identified under the proposed project. Therefore, significant and unavoidable traffic impacts would not occur under this alternative.

Operational impacts associated with increased air emissions; noise levels; and changes in visual character; public services and utilities would be similar to those associated with the proposed project but would be less in magnitude because there would be less development at the SE SWTF site and no new roadway and intersection improvements associated with traffic mitigation would be required.

Ability to Meet Project Objectives

Implementation of Alternative 2 would meet all of the project objectives. Under this alternative, the size and location of all other facilities, including the proposed new and expanded SWTF's, pipelines, storage tanks, groundwater wells, and groundwater recharge basins would remain largely unchanged. This would allow for the City to provide sustainable and reliable water supplies to meet the demand of existing and future customers through 2025.

6.4 Environmentally Superior Alternative

CEQA requires identification of an environmental superior alternative; that is, the alternative that has the least significant impacts on the environment. Table 6-1 presents a comparison of impacts by issue area after mitigation for the proposed project and each of the alternatives. While the No Project Alternative would result in no impacts when compared to the proposed project because no infrastructure would be installed, it would not achieve any of the proposed project objectives. As shown in Table 6-1 and as discussed in the alternatives analysis above, Alternative 2 would be

the environmentally superior alternative. This alternative would have similar but less environmental impacts when compared to the proposed project because less construction would take place due to the elimination of the relocation of water division administrative offices and corporation yard. As a result short term construction emissions of criteria pollutants and operational traffic impacts would occur and still be significant and unavoidable but they would be less in magnitude when compared to the proposed project. It would also meet all of the proposed project objectives.

TABLE 6-1
SUMMARY OF ALTERNATIVES ANALYSIS

Issue Area	Proposed Project	No-Project Alternative	Alternative 1	Alternative 2
Meets Project Objectives?	Yes	No	Yes	Yes
Environmental Impacts				
4.2 Land Use and Agriculture	LS	NI	LS	LS
4.3 Geology and Soils	LS	NI	LS	LS
4.4 Hydrology and Water Quality	LS	NI	LS	LS
4.5 Biological Resources	LS	NI	LS	LS
4.6 Transportation	SU	NI	SU	SU-Less
4.7 Air Quality and Climate Change	SU	NI	SU-Less	SU-Less
4.8 Noise	LS	NI	LS	LS
4.9 Hazards and Hazardous Materials	LS	NI	LS	LS
4.10 Public Services and Utilities	LS	NI	LS	LS
4.11 Aesthetics	LS	NI	LS	LS
4.12 Cultural Resources	SU	NI	SU	SU

SU = Significant and Unavoidable Impact
LS = Less than Significant Impact
NI = No Impact
SU-Less = Significant and Unavoidable Impact but less order of magnitude than proposed project

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CHAPTER 8
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6. Alternatives Analysis

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CHAPTER 9
Acronyms and Definitions

µg/m3	micrograms per cubic meter
AB	Assembly Bill
AD	Anno Domini
ADT	average daily traffic
ADWF	Average dry weather flow
AEP	annual exceedance probability
af	acre-feet
AFY	acre-feet per year
AIA	Air Impact Assessment
ALUCP	Airport Land Use Compatibility Plan
APCDs	air pollution control districts
AQMD	air quality management district
ARB	Air Resources Control Board
ARV	air relief valve
ASR	Aquifer Storage and Recovery
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe
B.P.	before present
BPS	Best Performance Standards
BPTC	Best Practicable Treatment and Control
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
Cal OSHA	Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBC	California Building Code

CCAA	California Clean Air Act
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CDF	California Department of Forestry and Fire Protection
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CH_4	methane
CHP	California Highway Patrol
City	City of Fresno
CIWMB	California Integrated Waste Management Board see Cal Recycle
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CM	Centimeters
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalents
CoC	Constituents of Concern
COG	Council of Governments
Corps	US Army Corps of Engineers
CPUC	California Public Utilities Commission
CSU Fresno	California State University Fresno
CUPA	Certified Unified Program Agency
CVEC	Central Valley Energy Center
CVFPB	Central Valley Flood Protection Board
CVP	Central Valley Project
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CY	cubic yards
dB	decibels
dBA	A-weighted decibels

DHS	Department of Health Services (California)
DNL	Day-night average sound level
DOT	U.S. Department of Transportation
DPH	California Department of Public Health
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EC	Electrical Conductivity
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
EPO	U.S. Emergency Preparedness Office
ES	Executive Summary
ESA	Federal Endangered Species Act
FAA	Federal Aviation Administration
FAX	Fresno Area Express
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
FCMA	Fresno Clovis Metropolitan Area
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FID	Fresno Irrigation District
FIP	Federal Implementation Plan
FIRM	Flood Insurance Rate Map
FMFCD	Fresno Metropolitan Flood Control District
FMMP	Farmland Mapping and Monitoring Program
FMSI	Fresno Major Street Impact Fee
FTA	Federal Transit Administration
g	grams
GHG	greenhouse gases
GVW	gross vehicle weight
HABS	Historic American Buildings Survey
HAER	Historic American Engineering Record
HAP	hazardous air pollutant

HMMP	Hazardous Materials Management Plan
HPD	Historic Properties Directory
HWCL	Hazardous Waste Control Law
Hz	Hertz
IBC	International Building Code
ISR	Indirect Source Review
ITE	Institute of Transportation Engineers
JPA	Joint Powers Agreement
KW	kilowatt
LEA	Local Enforcement Agency
LOS	Level of Service
LVW	Loaded Vehicle Weight
MCL	Maximum Contaminant Levels
MEI	Maximally Exposed Individual
Mg/L	milligrams per liter
mgd	million gallons per day
mm	millimeters
MMRP	Mitigation Monitoring and Reporting Plan
MOP	Metropolitan Planning Organization
MRZ	Mineral Resource Zones
MSL	mean sea level
MSDS	materials safety data sheet
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutant
NE SWTF	Northeast Surface Water Treatment Facility
NFIP	National Flood Insurance Program
NFWRF	North Fresno Water Reclamation Facility
NO_2	nitrogen dioxide
NOD	Notice of Determination
NOI	Notice of Intent
NOP	Notice of Preparation

NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O&M	operations and maintenance
OAL	Office of Administrative Law
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PG&E	Pacific Gas and Electric
PGA	peak ground acceleration
PM	particulate matter
ppm	parts per million
PPV	peak particle velocity
PRC	California Public Resources Code or Public Resources Code
PRM	Paleontological Resources Mitigation
PUC	Public Utilities Commission
PV	photovoltaic
REA	Registered Environmental Assessor
RCRA	Resource Conservation and Recovery Act
RMS	root mean square
ROG	reactive organic gases
ROW	right-of-way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Boards
RWRF	Regional Wastewater Reclamation Facility
SB	Senate Bill
SCADA	Supervisory Control and Data Acquisition
SDC	Seismic Design Category
SDWA	Safe Drinking Water Act
SEGA	Southeast Growth Area
SEMS	Standardized Emergency Management System
SE SWTF	Southeast Surface Water Treatment Facility
SF	square foot
SIP	State Implementation Plan

SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLC	Species of Local Concern
SLIC	Spills, Leaks, Investigations, and Cleanups
SO_2	Sulfur dioxide
SOI	Sphere of Influence
SR	State Route
SSJVIC	Southern San Joaquin Valley Information Center
SVP	Society of Vertebrate Paleontology
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
SWQMP	Storm Water Quality Management Program
SWRCB	State Water Resources Control Board
SW SWTF	Southwest Surface Water Treatment Facility
SWTF	Surface Water Treatment Facility
TAC	Toxic Air Contaminant
TDS	total dissolved solids
TGM	transmission grid main
TIS	Traffic Impact Study
TMDL	Total Maximum Daily Load
TPZ	Tree Protection Zone
TSCA	Toxic Substance Control Act
TSMI	Traffic Signal Mitigation Impact Fee
TWLTL	two-way left-turn lane
UBC	Uniform Building Code
UPTC	Union Pacific Transportation Company
USA	Underground Service Alert
USBR	U.S. Bureau of Reclamation
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tanks
UWMP	Urban Water Management Plan
Valley	San Joaquin Valley
Vdb	decibel notation

VMT	vehicle miles traveled
Water Division	City of Fresno Water Division
WDR	Waste Discharge Requirement
WWTP	Waste Water Treatment Plant

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Appendices

Provided on CD