Draft - Volume I

STOCKTON DELTA WATER SUPPLY PROJECT

Program Environmental Impact Report
State Clearinghouse No. 2003112060

Prepared for:
City of Stockton

April 2005

In association with

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CITY OF STOCKTON

8950 Cal Center Drive
Suite 300
Sacramento, CA 95826
916.564.4500
www.esassoc.com

San Francisco

Oakland

Los Angeles

Seattle

Santa Fe

Clearwater

Orlando

200090

In association with

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EXECUTIVE SUMMARY

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PROJECT OVERVIEW

The City of Stockton (City) proposes to develop the Delta Water Supply Project (DWSP) as a new supplemental water supply for the City of Stockton Metropolitan Area (COSMA). The City is seeking to secure a long-term supplemental surface water supply to use conjunctively with its local groundwater resources and other existing surface water supply sources. The City has applied to the State Water Resources Control Board (SWRCB) for a water rights permit to divert water from the Sacramento-San Joaquin Delta. The City's water rights application addresses a long-term planning horizon through the year 2050, requesting an ultimate diversion to 125,900 AF/year.

The City proposes to construct a new water intake facility, transmission pipelines, and a water treatment plant (WTP) as part of the DWSP. The DWSP would be incrementally expanded as the need for additional treated water supply develops. The initial phase of the DWSP is needed immediately and is proposed for implementation in 2009. The first phase of the DWSP is designed to meet the treated water supply needs of full development (build-out) under the City's current 1990 General Plan, which is anticipated to occur by about the year 2015. The initial treatment plant capacity would be 30 million gallons per day (mgd).

The DWSP is proposed as a conjunctive use program that would integrate surface water and groundwater supply. The surface water component of the DWSP would include an intake facility with fish screens on the San Joaquin River, new pipelines to convey Delta water to a new water treatment facility located just north of the COSMA, and treated water pipelines to deliver water to the City's existing water distribution system. The groundwater component would include coordinated groundwater and surface water management. Initially groundwater levels would be allowed to recover by in-lieu (natural) recharge. Ultimately treated Delta surface water could be injected into the groundwater basin underlying the COSMA, for later extraction during periods of limited surface water supply (referred to as an Aquifer Storage and Recovery (ASR) program).

The DWSP would be expanded in increments to keep pace with the COSMA's needs based on the timing of existing supply reductions and increased demand over time. The target date for the initial operation of the DWSP WTP is 2009. Initially the DWSP would be sized with a WTP capacity to treat and deliver up to 30 mgd (33,600 AF/year) of water. Ultimately by about 2050, the WTP would be expanded to treat 160 mgd to treat a maximum diversion of 125,900AF/year of surface water.

PROJECT LOCATION

The DWSP intake facility would be located on the San Joaquin River, with the raw water pipelines connecting to a WTP just north of Stockton, California. The proposed location for the intake site is on the southwest tip of Empire Tract adjacent to the Stockton Deep Water Ship Channel. The proposed raw water pipelines would extend from the intake and parallel the Empire Tract levee to Eight Mile Road, where they would turn east and parallel the north side of Eight Mile Road to Pixley Slough. The alignment then would turn north, parallel Pixley Slough to the west side of Lower Sacramento Road, and finally north to the proposed WTP site. The proposed WTP site is located on the west side of Lower Sacramento Road, just north of the City and approximately three miles east of Interstate 5 (I-5) on a 126-acre parcel. The WTP would occupy approximately 56 acres along the western side of the parcel. The treated water pipeline would parallel the east side of Lower Sacramento Road south to the south side of Eight Mile Road. From the intersection of Lower Sacramento and Eight Mile Roads, the pipeline would go south along Lower Sacramento Road, and east and west along Eight Mile Road to connect with the existing City and Cal Water distribution systems.

PROJECT OBJECTIVES

The DWSP was developed to meet the following objectives:

- To replace declining and unreliable surface water supplies.
- To protect and restore groundwater resources.
- To provide adequate water supply to accommodate planned growth.

The primary purpose of the proposed DWSP is to provide a secure, reliable supplemental supply of water for the COSMA to meet the current and future water needs while reducing dependence on and protecting groundwater.

CEQA EIR PROCESS AND ROLE OF THE PROGRAM EIR

The City of Stockton has prepared this Draft Environmental Impact Report (EIR) to provide the public and responsible and trustee agencies with information about the potential environmental effects of the proposed DWSP. This EIR was prepared in compliance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) of 1970 (as amended), and the CEQA Guidelines (California Code of Regulations, Title 14). As described in CEQA Guidelines Section 15121(a), an EIR is a public information document that assesses potential environmental effects of the proposed project, and identifies mitigation measures and alternatives to the proposed project that would reduce or avoid adverse environmental impacts. CEQA requires that state and local government agencies consider the environmental consequences of projects over which they have discretionary authority.

The City has prepared a Program EIR (PEIR) that provides programmatic evaluation of the overall long-term DWSP, which involves a water right request for diversion of up to 125,900 AF/y of water from the San Joaquin River and facilities to divert, convey, treat and distribute this amount of water. The PEIR also provides project-level evaluation of the initial phase of the DWSP to construct and operate diversion, conveyance, treatment and transmission facilities for up to 30 mgd. The City of Stockton intends to use this PEIR to: a) support Stockton approval of construction and operation of the initial DWSP facilities and 30-mgd WTP, b) support SWRCB consideration and approval of its water rights application for San Joaquin River diversion, and c) to provide the foundation for future CEQA evaluation as needed of phased expansion of the DWSP beyond the initial 30-mgd.

This PEIR is also intended for use by other responsible agencies that have permit and/or other approval authority over aspects of the DWSP. These agencies include, but are not limited to the State Water Resources Control Board, Regional Water Quality Control Board - Central Valley, state Department of Health Services, California Department of Fish and Game, State Reclamation Board, Army Corps of Engineers, U.S. Fish and Wildlife Service, NOAA Fisheries, U.S. Coast Guard, and regional and local agencies including the San Joaquin Air Pollution Control District, San Joaquin County, and local reclamation districts.

PUBLIC COMMENTS: ISSUES TO BE RESOLVED AND AREAS OF CONCERN

A Notice of Preparation (NOP) for the DWSP EIR was circulated for public review on November 17, 2003, pursuant to Section 15082 of the *CEQA* Guidelines. The NOP included a summary of probable environmental effects of the proposed project. In addition, two separate scoping sessions were held on December 8, 2003 in the City. Written comments received on the NOP and oral testimony given during the scoping sessions were considered in the preparation of this EIR and are included in Appendix A. Concerns, comments, and issues raised regarding the proposed DWSP project are summarized below. Those comments that are within the jurisdiction of CEQA are addressed within the Draft EIR.

LAND USE, RECREATION, AND AESTHETICS COMMENTS:

- The EIR should evaluate the conversion of agricultural land to another use.
- The EIR should evaluate the impacts of the DWSP on recreational uses of the Delta.

DELTA WATER RESOURCES AND FISHERIES COMMENTS:

- The EIR should acknowledge that the proposed DWSP diversions by the City, other than the water re-diverted under Water Code Section 1485, are junior to the rights held by Contra Costa Water District (CCWD).

- The EIR should clarify which diversions by the City will be subject to Term 91.

- The EIR must include analysis of potential Delta water quality effects that would affect CCWD Delta intakes and the quality of water delivered to CCWD's customers.

- The EIR must disclose how any adverse water quality impacts will be avoided or mitigated.

- The EIR must fully analyze and disclose DWSP impacts on Bay-Delta fisheries and other Delta ecosystem impacts.

TRANSPORTATION AND TRAFFIC COMMENTS:

- The EIR should analyze the long-term traffic impact of the project needs and specific mitigation measures for impacts.

CUMULATIVE IMPACTS

- The EIR should include the Mariposa Lakes Project as a probable future project in its cumulative analysis.

ALTERNATIVES ANALYSIS COMMENTS:

- The EIR should provide information on the criteria used for locating the DWSP water treatment plant.

GROWTH-INDUCING IMPACTS COMMENTS:

- EIR should evaluate the growth-inducing impacts of the DWSP.

SUMMARY OF ENVIRONMENTAL IMPACTS

Table ES-1, presents a summary of DWSP impacts found to be significant or potentially significant, and the proposed mitigation measures that would avoid or minimize potential impacts. In the table, the level of significance of each environmental impact is indicated after the application of the recommended mitigation measure(s). Chapters 3, 4, 5, and 6 include detailed discussions of all project impacts and mitigation measures. Provided below is a list of significant unavoidable effects that are identified for the proposed DWSP in Chapters 3, 4, 5, and 6 of the EIR.

SIGNIFICANT UNAVOIDABLE EFFECTS

The potential significant impacts associated with the construction and operation of the DWSP that have been found to be significant unavoidable include:

- The permanent conversion of 56.02 acres of economically viable prime farmland, unique farmland or farmland of statewide importance to non-agricultural use, which would occur with the installation of the 160-mgd DWSP WTP and raw water pipeline appurtenant facilities.

- The long-term degradation of Delta scenic and visual resources found in the immediate vicinity of the proposed DWSP intake facility.

- The introduction of light and/or glare at the DWSP intake facility and at the WTP. These new sources of nighttime lighting would adversely affect local nighttime views during the life of the project.

- The short-term emission of air pollutants during DWSP construction including:

  – Generation of PM_{10} emissions (dust) from construction activities and equipment that would contribute to both project and cumulative emissions from other ongoing construction projects.

  – Generation of NO_x and ROG emissions from construction vehicles that would contribute to both project and cumulative emissions from other ongoing construction projects.

- The significant unavoidable secondary effects associated with planned urban growth, as described in the 1990 Stockton General Plan and associated EIR, which implementation of the initial 30-mgd DWSP would accommodate. Expansion of the DWSP in phases up to the ultimate 160-mgd WTP would be implemented as needed to accommodate additional planned growth within the COSMA. Future planned growth is also expected to have some significant unavoidable environmental effects such as those associated with the existing 1990 General Plan including : loss of agricultural land, loss of habitat, increased traffic and traffic congestion, air quality impacts, increased traffic noise, increased wastewater treatment demand, alteration of the region's visual character, and increased use of non-renewable fossil fuels (City of Stockton, 1990a, b).

EFFECTS THAT ARE LESS THAN SIGNIFICANT WITH MITIGATION

The potential significant impacts associated with the construction and operation of the DWSP that have been found to be less than significant with implementation of mitigation measures are summarized as follows and presented in detail in Table ES-1:

CONSTRUCTION IMPACTS

Construction of the DWSP facilities would have significant impacts that would be mitigated to less than significant in the following areas:

- Access to land uses along the pipeline alignment including recreation facilities, commercial and emergency traffic, bicycle/pedestrian access

- Sedimentation and other contamination of surface and groundwater

- Release of fuels and hazardous materials

- Disturbance of contaminated soil and/or groundwater

- Loss of jurisdictional wetlands

- Impacts to special-status species, riparian and other sensitive habitats

- Noise emissions

- Reduce road capacity and parking
- Increase wear-and-tear on designated haul routes
- Increase traffic safety hazards
- Increase traffic management during pipeline construction
- Disrupt and conflict with utility services
- Damage cultural resources
- Stranding of fish during dewatering for construction of the intake facility

OPERATION IMPACTS

Operation of the DWSP facilities would have significant impacts that would be mitigated, upon adoption, to less than significant in the following areas:

- Access to recreation facilities
- Soil-related hazards, subsidence, and secondary seismic hazards
- Increased drainage flows
- Impacts to special-status species at the intake facility
- Air pollutant and noise emissions
- Release of fuels and hazardous materials
- Impingement and entrainment of fish and macroinvertebrates

ALTERNATIVES TO THE PROPOSED PROJECT

CEQA *Guidelines* (Sections 15123[b][3] and 15126[d]) requires an EIR to consider a range of alternatives that could feasibly attain the basic objectives of the proposed DWSP. Alternatives evaluated in the PEIR include alternative water supply options, alternative facilities, and alternative sites for DWSP facilities. The alternatives evaluated in Chapter 7, Alternatives Analysis, include:

- **No Project Alternative**
- **Alternative Water Supply and Facility Options**
  - In-Delta Storage Project

  - SEWD Expanded Water Supply and WTP
  - Mokelumne River Regional Water Storage and Conjunctive Use Project (MORE WATER Project)
  - Eastern Water Alliance Regional Water Supply Project using Freeport Regional Water Project Facilities
  - Farmington Groundwater Recharge Program
  - New Hogan Reservoir Re-Operations
  - Other Local Water Supplies
  - Water Transfers
  - Aggressive Water Recycling
  - Aggressive Water Conservation
- **Alternative DWSP Facilities Sites**
  - 4 Intake site options
  - 4 WTP site options
  - Pipeline route options

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The alternatives discussed above outlines those alternatives to the proposed DWSP components that are evaluated in this EIR to determine if they would avoid or minimize significant impacts associated with implementation of the DWSP. Based on the analysis of alternatives in Chapter 7, the proposed DWSP is considered to be the environmentally superior alternative. The DWSP provides substantial environmental benefits to the overdrafted local and regional groundwater resources in addition to meeting the needs of planned growth and development within the Stockton community and accommodating orderly growth as it is planned and approved by Stockton. The DWSP does not have significant environmental effects of Delta water resources or fishery resources. The environmental impacts of the DWSP have been minimized to the extent possible through careful facility siting and operations planning. Many of the impacts identified for the project are construction-related and would be mitigated to less than significant during the construction without causing long-term, permanent environmental impacts.

Other water supply option alternatives either did not reduce or avoid the impacts of the DWSP because the DWSP facilities would have to be constructed and operated in addition to alternative facilities (e.g., In-Delta Storage) and/or the alternative did not provide adequate water supply to meet the City's project objectives. In addition, the alternative supply options have additional environmental impacts that could result from their implementation.

Regarding alternative DWSP facility sites, Stockton evaluated several site options for the delta intake, the pipelines and the WTP with respect to environmental and engineering factors to identify the best site options that avoid or reduce engineering constraints and environmental impacts. The proposed DWSP facilities sites are environmentally superior to the other alternatives considered.

TABLE ES-1
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	DWSP Facility / Level of Significance after Mitigation
SECTION 3.2. LAND USE, RECREATION, AND AESTHETICS		
LU-2: Construction of proposed Delta Water Supply Project (DWSP) facilities could reduce access to, or interfere with the use of existing recreational facilities.	**LU-2:** During intake and pipeline construction, alternative access shall be maintained to all recreational facilities identified in Impact LU-2.	Intake: LSM Pipelines: LSM WTP: NI
LU-5: Construction of the DWSP WTP and the raw water pipeline appurtenant facilities would convert economically viable prime farmland and farmland of statewide importance to non-agricultural use.	**LU-5a:** The 70-acres of farmland at the WTP site, not required for the 30 mgd WTP and future expansions to 160-mgd WTP, shall remain available for farming operations for as long as is economically and environmentally feasible. **LU-5b**: If the City adopts an agricultural land conversion mitigation policy prior to 2010, the City shall pay into a "farmland trust" fund for San Joaquin County that will acquire ACEs to compensate for the conversion of important farmland at the WTP site and along the raw water pipeline alignment. The farmland subject to the easements shall be of the same acreage, and at least the same category of farmland, as identified by the latest FMMP report, as that farmland affected at the WTP and along the raw water pipeline alignment	Raw Water Pipelines: SU WTP: SU
LU-9: Operation of the DWSP intake could reduce access to, or interfere with the use of existing recreational facilities.	**LU-9:** The design of the intake facility shall provide for continued public access to the San Joaquin River and Disappointment Slough. Pedestrian access shall be designed to discourage trespassing on adjacent properties.	Intake: LSM
LU-10: The DWSP intake and WTP would have a substantial adverse effect on scenic vistas, substantially damage scenic resources, or substantially degrade the existing visual character or quality of the site and its surroundings.	**LU-10:** The design of the intake facility and WTP, including the choice of color and materials, shall seek to reduce the visual impact of the facilities. Bright reflective materials and colors shall be avoided.	Intake: SU WTP: LS

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
LU-11: The DWSP intake and WTP would create a new source of substantial light or glare that would adversely affect nighttime views in the area.	**LU-11:** Outdoor light sources shall be properly shielded and installed to prevent light trespass on adjacent properties. Any flood or spot lamps installed for purposes other than waterway navigation must be aimed no higher than 45 degrees above straight down (half-way between straight down and straight to the side) when the source is visible from any off-site residential property or public roadway.	Intake: SU WTP: SU
SECTION 3.3. GEOLOGY, SOILS, AND SEISMICITY		
GEO-1: Construction of the proposed DWSP could lead to accelerated soil erosion and possible sedimentation of local surface waters.	**GEO-1:** The City shall prepare a Storm Water Pollution Prevention Plan (SWPPP) for all construction phases of the proposed project, as required by the CVRWQCB. The objectives of the SWPPP are to identify pollutant sources that may affect the quality of storm water discharge and to implement Best Management Practices (BMPs) to reduce pollutants in storm water discharges. BMPs may include, but would not be limited to: • Excavation and grading activities in areas with steep slopes or directly adjacent to open water shall be scheduled for the dry season only (April 15 to October 15), to the extent possible. This will reduce the chance of severe erosion from intense rainfall and surface runoff.	All: LSM

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• If excavation occurs during the rainy season, storm runoff from the construction area shall be regulated through a storm water management/erosion control plan that shall include temporary onsite silt traps and/or basins with multiple discharge points to natural drainages and energy dissipaters. Stockpiles of loose material shall be covered and runoff diverted away from exposed soil material. If work stops due to rain, a positive grading away from slopes shall be provided to carry the surface runoff to areas where flow would be controlled, such as the temporary silt basins. Sediment basins/traps shall be located and operated to minimize the amount of off-site sediment transport. Any trapped sediment shall be removed from the basin or trap and placed at a suitable location onsite, away from concentrated flows, or removed to an approved disposal site. • Temporary erosion control measures shall be provided until perennial revegetation or landscaping is established and can minimize discharge of sediment into nearby waterways. For construction within 500 feet of a water body, appropriate erosion control measures shall be placed upstream adjacent to the water body. • Erosion protection shall be provided on all cut-and-fill slopes. Revegetation shall be facilitated by mulching, hydroseeding, or other methods and shall be initiated as soon as possible after completion of grading and prior to the onset of the rainy season (by October 15).	

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TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• BMPs selected and implemented for the project shall be in place and operational prior to the onset of major earthwork on the site. The construction phase facilities shall be maintained regularly and cleared of accumulated sediment as necessary. Effective mechanical and structural BMPs that would be implemented at the project site include the following: – Mechanical storm water filtration measures, including oil and sediment separators or absorbent filter systems such as the Stormceptor® system, can be installed within the storm drainage system to provide filtration of storm water prior to discharge. – Vegetative strips, high infiltration substrates, and grassy swales can be used where feasible throughout the development to reduce runoff and provide initial storm water treatment. – Roof drains shall discharge to natural surfaces or swales where possible to avoid excessive concentration and channelization of storm water. – Permanent energy dissipaters can be included for drainage outlets. – The water quality detention basins are designed to provide effective water quality control measures including the following: • Maximize detention time for settling of fine particles; • Establish maintenance schedules for periodic removal of sedimentation, excessive vegetation, and debris that may clog basin inlets and outlets;	

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TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	• Maximize the detention basin elevation to allow the highest amount of infiltration and settling prior to discharge. • Hazardous materials such as fuels and solvents used on the construction sites shall be stored in covered containers and protected from rainfall, runoff, vandalism, and accidental release to the environment. All stored fuels and solvents will be contained in an area of impervious surface with containment capacity equal to the volume of materials stored. A stockpile of spill cleanup materials shall be readily available at all construction sites. Employees shall be trained in spill prevention and cleanup, and individuals shall be designated as responsible for prevention and cleanup activities. • Equipment shall be properly maintained in designated areas with runoff and erosion control measures to minimize accidental release of pollutants.	
GEO-2: In the event of seismic activity, strong ground motion, secondary hazards in the form of settlement, and/or associated ground failure (e.g., liquefaction) could possibly impact DWSP facilities.	**GEO-2a:** To reduce potential levee slope instability hazards along the San Joaquin River, the City shall retain a California-registered geotechnical or civil engineer to conduct a slope stability analysis of levees bordering the intake facility. The investigation will include an evaluation of the levee to determine if the soil materials present and the current level of compaction are satisfactory to support the proposed intake facility in the event of an earthquake based on the anticipated peak ground acceleration. If conflicting peak ground acceleration values are obtained, the City will apply the greater of the two values to ensure maximum structural integrity. Recommendations from this analysis shall be incorporated into the final grading and foundation design and submitted to the County and City.	All: LSM

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TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Engineering Divisions for review and approval before final grading and construction permits are issued. At a minimum, the intake's design will demonstrate compliance with 1997 UBC and 2001 CBC requirements for structures located in seismic zone 3.	
	GEO-2b: Facility design for all DWSP facilities will comply with the site-specific design recommendations as provided by a licensed geotechnical or civil engineer. These recommendations will be based on the anticipated peak ground acceleration for each project-component within the overall project area. In instances where conflicting peak ground acceleration values are obtained, the City will apply the greater of the two values to ensure maximum structural integrity. Design recommendations provided in the geotechnical report will demonstrate compliance with 1997 UBC and 2001 CBC requirements for structures located in seismic zone 3.	
	GEO-2c: To protect on-site personnel, ensure the integrity of the WTP facility and associated infrastructure (e.g., pipelines, intake structures, etc.), and minimize any disruption to water delivery in the event of a major earthquake, the City shall prepare an Earthquake Response Plan. The Earthquake Response Plan shall include an evacuation plan for all personnel-occupied structures and a post-earthquake inspection and repair plan to evaluate any damage that may have occurred and ensure the integrity of the mechanical systems to enable continued operation as soon as possible.	
GEO-3: Structural improvements associated with the proposed DWSP could be subject to soil-related hazards including expansive and/or corrosive soil materials or settlement.	**GEO-3a:** The City shall install a cathodic protection system for all underground metallic fittings, appurtenances, and piping to protect these facilities from of corrosion. The cathodic protection system shall be designed consistent with City standards.	All: LSM

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TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	GEO-3b: Isolation valves will be incorporated into all pipelines to prevent significant losses of surface water in event of pipeline rupture. The specifications of the isolation valves will conform to the UBC, AWWA, and City standards.	
GEO-4: DWSP facilities, including pipelines, intake facilities, sub-surface foundations, and other underground utilities, would be subjected to hazards associated with regional subsidence.	**GEO-4:** Final design of the intake facility will take into account projected subsidence rates within the eastern Delta to ensure that the finished floor elevation remains above the 100-year flood elevation and includes three feet of freeboard during the operational life expectancy of the intake facility. This will be accomplished by determining the projected rate of subsidence for Empire Tract over the next 100 years and adding that projected change in elevation onto the current design finished floor elevation for the intake facility. This design feature will ensure sufficient height above the 100-year flood elevation during the operational life of the DWSP.	Intake: LSM Pipelines: LSM WTP: LS
SECTION 3.4. DRAINAGE AND FLOODPLAIN MANAGEMENT		
DFM-1: Dewatering of excavated areas during construction in areas of shallow groundwater could affect surface water quality.	**DFM-1:** During construction if groundwater can not be contained on-site, the City shall pump the water into multiple gallon Baker tanks or approved equivalent with either a filter or gel coagulant system or other containment to remove sediment. The remaining water will then be discharged to irrigation ditches. On upland areas sprinkler systems may be used to disperse the water in farmers' fields. BMPs, as described in the SWPPP, will also be implemented, as appropriate, to retain, treat, and dispose of groundwater. Measures shall include but are not be limited to: • Retaining pumped groundwater in surface facilities to reduce turbidity and suspended sediments concentrations.	All: LSM

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• Treating (i.e., flocculate) pumped groundwater, as appropriate, to reduce turbidity and concentrations of suspended sediments. • Directly conveying pumped groundwater to a suitable land disposal area capable of percolating flows. If contamination is suspected, water collected during dewatering will be tested for contamination prior to disposal. Discharges shall comply with the CVRWQCB's requirements.	
DFM-2: DWSP construction activities could result in increased erosion and sedimentation, or release fuels or other hazardous materials associated with construction equipment that could impact surface water quality.	Implementation of Mitigation Measure GEO-1 will reduce potential impacts to less than significant. No additional measures will be required	All: LSM
DFM-3: DWSP intake and WTP facilities would increase the amount of impervious surfaces, which in turn would increase local storm runoff volumes that could exceed the capacity of on-site drainage systems, and create localized flooding or contribute to a cumulative flooding impact downstream.	**DFM-3:** The City shall comply with all measures of the City's Stormwater Quality Control Criteria Plan to effectively manage and minimize increases in storm water runoff resulting from the operation of DWSP facilities. Measures to be implemented may include detention basins, vegetated swales, buffer strips, and/or infiltration basins.	Intake: LSM WTP: LSM
DFM-4: Removal and stockpiling of trench and tunnel spoils during construction of the raw and treated water pipelines could release chemicals or spoils into the surrounding environment that could affect surface water quality.	**DFM-4:** The City shall limit impacts due to trench and tunnel spoils by hauling contaminated spoils off-site and disposing of them at a permitted waste disposal facility. Spoils containing high volumes of water shall either be transported off-site to a suitable disposal area or retained on-site and treated similar to the pumped groundwater specified in Mitigation Measure DFM-1.	Pipelines: LSM

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TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
DFM-5: Construction of the intake facility and raw water pipelines could potentially increase the risk of flooding on Empire Tract and King Island.	**DFM-5:** Implementation of Mitigation Measure GEO-1will reduce potential impacts to less than significant. In addition, the construction contractor will secure a permit from the State Reclamation Board for modifications to the levee in the vicinity of the intake and tunneling for pipeline crossings of jurisdictional waterways. The construction contractor will also develop and implement an Erosion Control and Sedimentation Plan, which will include all the necessary local jurisdiction requirements regarding erosion control as required in the SWPPP.	Intake: LSM Pipelines: LSM
SECTION 3.5. BIOLOGICAL RESOURCES		
BIO-1: Construction of DWSP facilities would result in the loss of jurisdictional waters of the U.S., including wetlands.	**BIO-1**: Prior to construction, the City shall obtain and comply with federal and state permit requirements pertaining to impacts on waters of the U.S. and of the State. The City shall coordinate with the Corps to obtain a permit under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, and with the CVRWQCB to obtain Section 401 water quality certification. The City also shall coordinate with CDFG to obtain a Section 1600 streambed alteration agreement. Terms of these permits and agreements could include additional provisions.	Intake: LSM Pipelines: NI WTP: NI

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TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	For open trench construction crossing minor wetland ditches (less than 15 feet in width), the following measures shall be implemented: • Implement Mitigation Measure GEO-1, to reduce impacts to wetlands during open trench construction. • Conduct all trenching and construction activities across drainages and seasonal wetlands during low-flow or dry periods; • Place sediment curtains upstream and downstream of the construction zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone; • Locate spoil sites such that they do not drain directly into the drainages and/or seasonal wetlands; • Store equipment and materials away from the drainages and wetland areas. No debris will be deposited within 25 feet of the drainages and wetland areas; • Return an impacted wetland to original grade following pipeline installation. Any wetland area left bare following construction will be revegetated using hydroseed and/or plugs of native vegetation matching the species composition of adjacent wetland areas.	

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TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
BIO-2: Construction of DWSP facilities could result in impacts to the following special-status species: giant garter snake, Swainson's hawk, western pond turtle, white-tailed kite, other nesting raptors, loggerhead shrike, western burrowing owl, Suisun marsh aster, rose mallow, Delta tule pea, Mason's lilaeopsis, Delta mudwort, eel-grass pondweed, Sanford's arrowhead, marsh skullcap, and blue skullcap.	**BIO-2a:** The City anticipates that the DWSP would be approved for participation in the the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) for the land-based facilities (pipelines and WTP). Compliance with the SJMSCP would provide for impact avoidance measures (e.g., pre-construction surveys during appropriate seasons for identification, construction set-backs, restriction on construction timing) and mitigation for loss of habitat for all species that may be affected by this impact, with the exception of eel-grass pondweed and marsh skullcap. Impact avoidance measures would include, but are not limited to, the species-specific measures presented below, which are summarized from the SJMSCP. Complete impact avoidance and habitat compensation measures from the SJMSCP are presented in detail in Appendix D. <u>Giant Garter Snake:</u> Construction shall occur between May 1 and October 1, which is the active period for the snake. Between October 2 and April 30, additional measures may be necessary to minimize and avoid take. Pre-construction surveys for the giant garter snake (conducted after completion of environmental reviews and prior to ground disturbance) shall occur within 24 hours of ground disturbance. Vegetation clearing and disturbance will be limited to the minimal area necessary within 200 feet of the banks of potential giant garter snake aquatic habitat. On-site construction personnel shall be given instruction regarding the presence of SJMSCP Covered Species and the importance of avoiding impacts to these species and their habitats.	All: LSM

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	Swainson's Hawk: In order to encourage the retention of known or potential Swainson's hawk nest trees (i.e., trees that hawks are known to have nested in within the past three years or trees, such as large oaks, which the hawks prefer for nesting), for any nest tree that becomes occupied during construction activities, all construction activities shall remain a distance of two times the dripline of the tree, measured from the nest. Alternatively, nest trees may be removed between September 1 and February 15, when the nests are unoccupied. Western Pond Turtle: When nesting areas for pond turtles are identified on a project site, a buffer area of 300 feet shall be established between the nesting site (which may be immediately adjacent to wetlands or extend up to 400 feet away from wetland areas in uplands) and the wetland located near the nesting site. These buffers shall be indicated by temporary fencing if construction has or will begin before nesting periods end (the period from egg laying to emergence of hatchlings is normally April to November). White-tailed Kite: For white-tailed kites, preconstruction surveys shall investigate all potential nesting trees on the project site (e.g., especially tree tops 15 to 59 feet above the ground in oak, willow, eucalyptus, cottonwood, or other deciduous trees), during the nesting season (February 15 to September 15) whenever white-tailed kites are noted on site or within the vicinity of the project site during the nesting season.	

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Loggerhead Shrike: A setback of 100 feet from nesting areas shall be established and maintained during the nesting season for the period encompassing nest building and continuing until fledglings leave nests. This setback applies whenever construction or other ground-disturbing activities must begin during the nesting season in the presence of nests which are known to be occupied. Setbacks shall be marked by brightly colored temporary fencing. Western Burrowing Owl: Burrowing owls may be discouraged from using the project area by managing vegetation and prey populations. If the project site is an unlikely occupation site for red-legged frogs, San Joaquin kit fox, or tiger salamanders, ground squirrel burrows may be destroyed to discourage occupation by burrowing owls. During the non-breeding season (September 1 through January 31) burrowing owls occupying the project site should be evicted from the project site by passive relocation as described in the CDFG's Staff Report on Burrowing Owls (CDFG, 1995). During the breeding season (February 1 through August 31) occupied burrows shall not be disturbed and shall be provided with a 75 meter protective buffer until and unless the TAC, with the concurrence of the Permitting Agencies' representatives on the TAC; or unless a qualified biologist approved by the Permitting Agencies verifies through non-invasive means that either: (1) the birds have not begun egg laying, or (2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. Once the fledglings are capable of independent survival, the burrow can be destroyed. Sanford's Arrowhead: Any populations of this species which occur in the project area will be completely avoided.	

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	<u>Suisun Marsh Aster, Rose Mallow, Delta Tule Pea, Mason's Lilaeopsis, Delta Mudwort, and Blue Skullcap:</u> If the plant population is considered healthy by the JPA with the concurrence of the Permitting Agencies' representatives on the TAC, then the parcel owner shall be approached to consider selling a conservation easement including a buffer area sufficient to maintain the hydrological needs of the plants. For blue skullcap, if the landowner rejects acquisition of the population, then the JPA shall, with the concurrence of the Permitting Agencies' representatives on the TAC, determine the appropriate mitigation measures (e.g., seed collection) for each plant population based upon the species type, relative health and abundance.	
	BIO 2b: The DWSP may impact primarily along the raw water pipeline alignment eel-grass pondweed and marsh skullcap, which are not listed species or species covered under the SJMSCP, but are CNPS List-2 species covered under CEQA *Guidelines* Section 15380. Therefore, the City shall conduct a pre-construction floristic survey for these species according to Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (CDFG, 2000) (Appendix E). These surveys shall be conducted during the species' blooming period, which occurs between June and July (eel-grass pondweed) and June and September (marsh skullcap). If these species cannot be avoided by the project, minimization and mitigation measures will be developed and implemented in consultation with the CDFG. These measures may include, but are not limited to the following:	

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	a) Minimizing impacts by restricting removal of plants to a few individuals of a relatively large population; b) Relocating plants to suitable habitat outside the project area, either within the project area or off-site; c) Monitoring affected populations to document potential project-related impacts; d) Implement habitat acquisition and/or mitigation bank participation to provide suitable compensation; and/or e) Protecting occupied habitat for the species on-site or at another regional location.	
BIO-3: Construction of the proposed DWSP raw and treated water pipelines could result in temporary impacts to riparian habitats or other sensitive natural communities.	**BIO-3:** Implementation of Mitigation Measures GEO-1 and BIO-1b will reduce potential impacts to less than significant. In addition, at jack and bore locations, the bore pits will be excavated at least 50 feet outside the edge of riparian vegetation to avoid impacts.	Pipelines: LSM
BIO-4: Construction of the proposed DWSP raw and treated water pipelines could impact native wildlife migration corridors or nursery sites.	Impacts to riparian habitat that may serve as wildlife corridors will be avoided with the implementation of Mitigation Measure BIO-3.	Pipelines: LSM
BIO-5: The proposed DWSP could conflict with adopted City and County tree preservation ordinances.	**BIO-5:** The City shall ensure that the project complies with the San Joaquin County General Plan Tree Preservation and Riparian Habitat requirements, and with the City's Tree Preservation ordinance. Prior to construction the City shall conduct a survey for heritage trees that may be	Intake: NI Pipelines: LSM WTP: LSM

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	impacted by the project (i.e., the dripline of trees is within the treated water pipeline alignment). The City shall coordinate with City and County staff to ensure that impacts to heritage trees are avoided to the extent feasible. If it is necessary to remove a heritage tree, a permit will be obtained from the City's Parks and Recreation Department. The tree(s) will be replaced on a one for one basis at the discretion of the City's Landscape Architect. The size of the replacement tree shall be based on the size of the tree removed. If heritage trees are identified in riparian areas, the City shall implement Mitigation Measure BIO-3.	
SECTION 3.6. AIR QUALITY		
AIR-1: Construction of DWSP facilities would result in a temporary increase in air pollutant emissions.	**AIR-1a:** The City shall comply with Regulation VIII and implement its control measures during construction. The following applicable control measures listed by the Valley Air District shall be implemented, where appropriate (SJVUAPCD, 2004). • The City shall submit a Dust Control Plan subject to review and approval of the Valley Air District at least 30 days prior to the start of any construction activity on a site that includes five acres or more of disturbed surface area (SJVUAPCD, 2004). Specific control measures for construction, excavation, extraction, and other earthmoving activities listed by the Valley Air District (SJVUAPCD, 2004) include:	All: SU for NO_x and ROG All: LSM for PM_{10} and CO.

Less than Significant Impact = LS Less than Significant Impact with Mitigation = LSM Significant Unavoidable Impact= SU No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Pre-Activity • Pre-water site sufficient to limit visible dust emissions to 20 percent opacity, and • Phase work to reduce the amount of disturbed surface area at any one time. *During Active Operations* • Apply water or chemical/organic stabilizers/suppressants sufficient to limit visible dust emissions to 20 percent opacity; or • Construct and maintain wind barriers sufficient to limit visible dust emissions to 20 percent opacity. If utilizing wind barriers, the above control measure shall also be implemented. • Apply water or chemical / organic stabilizers / suppressants to unpaved haul / access roads and unpaved vehicle/equipment traffic areas sufficient to limit visible dust emissions to 20 percent opacity and meet the conditions of a stabilized unpaved road surface. *Temporary Stabilization During Periods of Inactivity* • Restrict vehicular access to the area; and • Apply water or chemical/organic stabilizers/ suppressants, sufficient to comply with the conditions of a stabilized surface. If 0.5 acres or more of disturbed surface area remains unused for seven or more days, the area must comply with the conditions for a stabilized surface area as defined in Rule 8011.	

Less than Significant Impact = LS Less than Significant Impact with Mitigation = LSM Significant Unavoidable Impact= SU No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Vehicle Movement • Limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within constructions sites to a maximum of 15 miles per hour. • Post speed limit signs that meet state and federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads. • To control wind generated fugitive dust, outdoor construction, excavation, extraction, and other earth moving activities that disturb the soil shall cease whenever the visible dust emissions exceeds 20 percent opacity. *Demolition Activities* • Apply sufficient water to building exterior surfaces, unpaved surface areas where equipment will operate, and razed building materials to limit the visible dust emissions to 20 percent opacity throughout the duration of razing and demolition activities. • Apply sufficient dust suppressants to unpaved surface areas within 100 feet where materials from razing or demolition activities will fall in order to limit the visible dust emissions to 20 percent opacity. • Apply sufficient dust suppressants to unpaved surface areas where wrecking or hauling equipment will be operated in order to limit the visible dust emissions to 20 percent opacity.	

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	• Handling, storage, and transport of bulk materials on-site or off-site resulting from the demolition of buildings shall comply with the requirements specified in Rule 8031 (Bulk Materials). • Apply water within one hour of demolition to unpaved surfaces within 100 feet of the demolished structure. • Prevent and remove carryout or trackout on paved public access roads from demolition operations in accordance with Rule 8041 (Carryout and Trackout). **AIR-1b:** The City shall implement the following mitigation measures listed below to reduce ozone precursor (NO_x and ROG) emissions from off-road equipment, where appropriate. • Use of alternative fueled or catalyst equipped diesel construction equipment; • Minimize idling time (e.g., 10 minute maximum); • Limit the hours of operation of heavy duty equipment and/or the amount of equipment in use; • Replace fossil-fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set); and • Implement activity management (e.g., rescheduling activities to reduce short-term impacts).	

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
AIR-2: Operation of the DWSP facilities would result in air emissions from powering of pumps, various processes, and equipment at the WTP and from vehicle trips to DWSP facilities.	**AIR-2:** The WTP shall be designed so that each piece of equipment operates in compliance with applicable Valley Air District permit requirements and regulations including the Authority to Construct and Permit to Operate. The equipment used, particularly the pumps and diesel generators, shall be operated as per the Valley Air District permit requirements and regulations.	Intake: LS Pipelines: NI WTP: LSM
SECTION 3.7. NOISE		
NOISE-1: Construction of DWSP facilities could temporarily increase noise levels at sensitive receptors.	**NOISE-1a:** Construction shall be limited to the hours of 7:00 a.m. to 10:00 p.m. **NOISE-1b:** The City shall require in construction specifications that the contractor select staging areas as far as reasonably feasible from existing residences. Activities within these staging areas shall conform to the time limitations established in Mitigation Measure NOISE-1a. **NOISE-1c:** The City shall require in construction specifications that the contractor maintain all construction equipment with manufacturers' specified noise muffling devices. **NOISE-1d:** The City shall require in construction specifications that the contractor place all stationary noise generating construction equipment as far away as reasonably feasible from sensitive receptors or in an orientation minimizing noise impacts (i.e., behind existing barriers or storage piles, etc.). **NOISE-1e:** The City shall develop a haul route plan to route construction traffic away from residential areas where feasible direct alternative routes exist.	All: LSM

Less than Significant Impact = LS Less than Significant Impact with Mitigation = LSM Significant Unavoidable Impact= SU No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
NOISE-2: Operation of the intake facility and WTP could increase noise levels at nearby sensitive receptors.	**NOISE-2:** The design of the WTP and intake structure shall ensure that operational noise levels at the property line do not exceed a noise level of 70 dBA from the stationary equipment sources. Shielding and other specified measures as deemed appropriate and effective by the design engineer to comply with this performance standard shall be incorporated in final WTP and intake facility designs. Noise reduction measures may include, but are not necessarily limited to: • Incorporation of equipment enclosures, fan silencers, mufflers, acoustical louvers, noise barriers, acoustical panels, etc.; • Location of particularly noisy equipment as far away as feasibly possible from the property line and away from surrounding sensitive land uses; • Orientation of acoustical exits away from sensitive receptors; and • Incorporation of buildings, landscaping, where possible, to absorb and/or redirect noise.	Intake: LSM WTP: LSM
SECTION 3.8. HAZARDOUS MATERIALS / PUBLIC HEALTH		
HAZ-1: Construction of the proposed DWSP facilities could result in the disturbance of contaminated soil and/or groundwater.	**HAZ-1a:** Prior to construction, the City shall conduct a Phase 1 Environmental Site Assessment according to ASTM protocol for intake and WTP sites and the pipeline alignments.	Intake: LS Pipelines: LSM WTP: LS

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	HAZ-1b: The City shall consult with the CVRWQCB to determine the precautions for installing the raw water pipelines within any area of contamination identified in the Phase 1 Environmental Site Assessment along Eight Mile Road. If soil and/or groundwater contamination are encountered, samples shall be collected prior to construction along the pipeline alignment in the area of known contamination to at least the depth of the proposed pipeline excavation. The samples shall be analyzed for the contaminants of concern identified for this area. In addition, if any unidentified contaminated soil and/or groundwater are encountered or if suspected contamination is encountered during any construction activities, work will be halted in the area of potential exposure, and the type and extent of the contamination will be identified. A qualified professional, in consultation with the appropriate regulatory agencies, i.e., DTSC, CVRWQCB, SJCEHD, and the Stockton Fire Department, will then remediate the contamination and properly dispose of the contaminated material.	
HAZ-2: Construction of the proposed DWSP would involve the use and storage of hazardous materials such as gasoline and diesel fuels, oils, and solvents. Depending on the relative hazard of the hazardous material, if a spill of significant quantity were to occur, the accidental release could pose both a hazard to construction employees and the environment.	**HAZ-2:** The City or its designated construction contractor shall prepare a Hazardous Materials Management Plan (HMMP) for construction. The HMMP will address storage, containment, and transfers of hazardous materials related to project construction. This plan will also address equipment maintenance, monitoring, training of employees, and emergency response related to hazardous materials. The San Joaquin County Office of Emergency Services staff will review the HMMP, training documents, and general safety conditions during routine inspections.	All: LSM

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
HAZ-3: Operation of the WTP could expose individuals to existing and/or potential future use of hazardous materials and generation of hazardous wastes.	**HAZ-3a:** The design engineer shall design the WTP to comply with all pertinent sections of the UBC, Uniform Fire Code, and HMMP. Final project design shall include, but not be limited to, the following design features and measures: • Incompatible chemicals will be physically separated; • Fire suppression and control systems in chemical storage areas will utilize the appropriate fire retardant; • All spill collection systems, containment, and aprons will be contained on site for truck pick up and not routed to any storm drain system; • Outdoor storage vessels will be protected from accidental vehicle contact; and • Bulk liquid hazardous materials delivery areas will include a delivery vehicle spill containment with collection sump. **HAZ-3b:** The City shall consult with the appropriate authorities regarding its responsibilities concerning hazardous materials and their inventory, handling, and emergency response training. The City shall also consult with the CUPA regarding compliance with all relevant sections of the State Health and Safety Code. Upon consultation with these agencies, the project applicant shall prepare and implement all required/requested documentation.	WTP: LSM

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
SECTION 3.9. TRANSPORTATION AND TRAFFIC		
TR-1: Construction of the raw and treated water pipelines could temporarily reduce the number of, or the available width of, travel lanes on roads, resulting in an unacceptable level of service (LOS) or volume-to-capacity (v/c) ratio.	**TR-1a:** The City shall prepare and implement a Traffic Control Plan for all project-affected roadways and intersections. The Traffic Control Plan will comply with requirements in encroachment permits issued by the County. The Traffic Control Plan may include, but not be limited to, the following measures: • Limit the construction work zone to a width that, when feasible, maintains one-way traffic flow past the construction zone. Where this is not feasible, construct temporary widening within the construction right of-way to maintain alternate one way traffic flow, or use detour signing on alternate access streets when temporary full street closure is required. • Restrict construction to non-peak traffic periods as required for work sites on roadways and intersections operating at less than LOS D. • During non-construction periods provide traffic controls and safety signage at all construction sites to manage traffic control and flows. • Coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to commercial areas (e.g., Christmas holiday shopping period) and schools. • Post advisories of construction activities (e.g., signs, articles in newspapers, the City's website, notices on radio/TV, etc.) to allow motorists to select alternative routes in advance.	Pipelines: LSM

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	TR-1b: In consultation with the County, the City shall identify areas where night construction may be appropriate. Candidate locations would be in non-residential zones operating at less than LOS D and where there are no sensitive noise receptors.	
	TR-1c: The City shall arrange for a 24-hour telephone hotline and/or website to address public questions and complaints during project construction, and to offer information about detours, carpooling opportunities, and traffic delays and congestion.	
TR-2: Construction of the proposed DWSP facilities would generate short-term increases in vehicle trips by construction workers and construction vehicles that could cause a substantial decrease in the LOS to that less than LOS D, i.e., approaching unstable operations where small increases in volume produce substantial increases in delay and decreases in speed.	**TR-2a:** As part of the Traffic Control Plan (see Mitigation Measure TR-1a), the City and the construction contractor shall specify designated haul routes for the project after consultation with agencies with local roadway jurisdiction.	All: LSM
	TR-2b: Where feasible, the City shall schedule the multiple daily work sites such that their relative locations shall disperse truck trips over a number of different haul routes, thereby lessening the number of truck trips on any one road at one time.	
TR-3: Construction of the proposed raw and treated water pipelines could adversely affect access to adjacent land uses and streets for both commercial and emergency traffic, and bicycle/pedestrian access.	**TR-3a:** As part of the Traffic Control Plan for roadway segments and intersections (refer to Measure TR-1a), the City shall develop a plan for maintaining emergency access and schools in consultation with local jurisdictions. The plans will include, but not be limited to, providing access through the construction zone, parking of fire trucks outside the firehouse on the side of the street opposite the construction during affected work hours, and identification of alternate routing around construction zones. Also, police, fire, and other emergency service providers will be notified of the timing, location, and duration of construction activities throughout the project, and the location of detours and lane closures.	Intake: NI Pipelines: LSM WTP: NI

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TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	TR-3b: The City shall use detour signing on alternate access streets established when temporary full street closure is required.	
	TR-3c: The City shall provide 72-hour advance notice of access restrictions for residents and businesses.	
TR-4: Construction of the proposed raw and treated water pipelines could generate a temporary demand for construction worker parking, and construction activity could temporarily displace existing on-street parking on pipeline alignment routes.	**TR-4:** The City shall require the contractor(s) to provide off-street parking for construction worker's vehicles in the vicinity of the work zone, and if sufficient parking cannot be locally provided, workers will be van-pooled to the work site from an off-site parking location.	Pipelines: LSM
TR-5: Construction of the proposed raw and treated water pipelines could increase potential traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways.	**TR-5a:** As part of the Traffic Control Plan for roadway segments and intersections (refer to Mitigation Measure TR-1a), the City shall ensure that the plan includes installation of advance warning signs and speed controls to achieve required speed reductions for safe traffic flow through the work zone.	Pipelines: LSM
	TR-5b: The City shall incorporate into contract specifications for all DWSP facilities, the requirement that traffic control plans (see Mitigation Measure TR-1a) include detours for bicyclists and pedestrians in all areas potentially affected by DWSP construction.	
TR-6: Construction of the proposed DWSP facilities could increase wear-and-tear on the designated haul routes used by construction vehicles to access the project work sites.	**TR-6:** Roads damaged by construction activities will be repaired to a structural condition equal to that which existed prior to construction activity.	All: LSM

Less than Significant Impact = LS | Less than Significant Impact with Mitigation = LSM | Significant Unavoidable Impact= SU | No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
SECTION 3.10. PUBLIC SERVICES AND UTILITIES / ENERGY		
PUB-1: DWSP pipeline construction could result in temporary, planned, or accidental disruption to utility services.	**PUB-1:** A detailed study identifying utilities within the facility sites/alignments shall be conducted during the pre-design stages of the project. For DWSP facilities with adverse impacts, the following mitigation measures are identified: • Utility excavation or encroachment permits shall be required from the appropriate agencies. These permits will include measures to minimize utility disruption. The City and its contractors shall comply with permit conditions, and such conditions shall be included in construction contract specifications. • Utility locations shall be verified through field survey (potholing) and use of the Underground Service Alert services. • Detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of the City's construction plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services. • The City shall employ special construction techniques in areas where the water pipelines will parallel wastewater pipelines. These special measures, which will be included in the engineering specifications, shall include trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the water main.	Pipelines: LSM

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	• Residents and businesses in the project area shall be notified of planned utility service disruption two to four days in advance, in conformance with county and state standards.	
PUB-2: Construction in specific segments of the proposed pipeline alignments could result in utility conflicts.	**PUB-2:** In order to reduce potential impacts associated with utility conflicts, the following measures shall be implemented in conjunction with Mitigation Measure PUB-1: • Disconnected cables and lines shall be reconnected as soon as possible. • Based on the utilities investigation to be conducted under Mitigation Measure PUB-1, the City shall consult with any entities having utility conflicts with the proposed DWSP to negotiate relocation efforts or other plans to resolve the conflict. • The City shall observe DHS standards which require 1) a 10-foot horizontal separation between parallel sewer and water mains (gravity or force mains); 2) one-foot vertical separation between perpendicular water and sewer line crossings. (In the event that separation requirements could not be maintained, the City shall obtain DHS variance through provisions of sewer encasement, or other means deemed suitable by DHS); and, 3) encasing water pipelines in protective sleeves where the pipeline crosses under or over an existing wastewater pipeline.	Pipelines: LSM
PUB-3: Pipeline construction could temporarily block access routes for city police departments, San Joaquin County Sheriff's Department, fire departments, and emergency services.	**PUB-3a:** The City shall coordinate with the Stockton Fire Department to maintain the required 24-hour access to Fire Station #14.	Pipelines: LSM

Less than Significant Impact = LS | Less than Significant Impact with Mitigation = LSM | Significant Unavoidable Impact= SU | No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	PUB-3b: In order to avoid blocking access to any nearby hospital, the City and its contractors shall schedule work on sections of the alignment so that multiple access points to the hospital are not blocked simultaneously.	
	PUB-3c: The City shall provide, upon request, a copy of the Traffic Control Plan to the sheriff's departments, local police departments, county fire departments, and local fire departments for their review prior to construction. The City shall provide 72-hour notice to the local emergency service providers prior to construction of individual pipeline segments.	
	PUB-3d: The City shall include, as part of construction contract specification provisions, steel trench plates at the construction site to maintain emergency access.	
PUB-4: DWSP construction could require short-term police and fire protection services to assist in traffic management or to respond to a construction-related accident.	Implementation of Mitigation Measure PUB-3c, above, will reduce potential impacts to less than significant. No additional measures will be required.	All: LSM
<u>SECTION 3.11. CULTURAL RESOURCES</u>		
CUL-1: Construction of DWSP facilities could damage unidentified buried archaeological, historical, or paleontological resources within the project area.	**CUL-1:** Work shall be stopped in affected areas if cultural resources are discovered during project construction and appropriate measures will be implemented.	All: LSM

Less than Significant Impact = LS Less than Significant Impact with Mitigation = LSM Significant Unavoidable Impact= SU No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Pursuant to CEQA Guidelines 15064.5 (f), "provisions for historical or unique archaeological resources accidentally discovered during construction" shall be instituted. Therefore, in the event that any prehistoric or historic subsurface cultural resources are discovered during ground disturbing activities, all work potentially affecting the resources shall be halted and the project proponent and/or lead agency shall consult with a qualified archaeologist or paleontologist to assess the significance of the find. If any find is determined to be significant, representatives of the project proponent and/or lead agency and the qualified archaeologist and/or paleontologist shall meet to determine the appropriate avoidance measures or other appropriate mitigation. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards. If the discovery includes human remains, CEQA Guidelines 15064.5 (e)(1) shall be followed: (e) In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps shall be taken: (1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: (A) The San Joaquin County coroner must be contacted to determine that no investigation of the cause of death is required, and (B) If the coroner determines the remains to be Native American:	

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	1. The coroner shall contact the NAHC within 24 hours. 2. The NAHC shall identify the person or persons it believes to be the most likely descended from the deceased Native American. 3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or (2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. (A) The NAHC is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission. (B) The descendant identified fails to make a recommendation; or (C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the NAHC fails to provide measures acceptable to the landowner.	

Less than Significant Impact = LS Less than Significant Impact with Mitigation = LSM Significant Unavoidable Impact= SU No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
SECTION 3.12 CUMULATIVE IMPACTS		
CUM-1: Implementation of the DWSP would contribute to the cumulative loss of important farmland in San Joaquin County.	Implement Mitigation Measure LU-5b – contribute in-lieu fees to a"farmland trust" fund for San Joaquin County for future acquisition of equivalent ACEs.	All: LSM
CUM-2: Construction activities associated with the proposed DWSP facilities would temporarily generate cumulatively considerable levels of PM_{10} and ozone precursor (ROG and NO_x) emissions to the SJVAB.	**CUM-2:** The City shall implement appropriate SJVAPCD enhanced additional control measures (SJVAPCD, 2002b). These measures may include the following: 1. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent; 2. Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site; 3. Install wind breaks at windward side(s) of construction areas; 4. Suspend excavation and grading activity when winds exceed 20 mph; (regardless of wind speed, an owner/operator must comply with Regulation VIII's 20 percent opacity limitation); 5. Limit area subject to excavation, grading, and other construction activity at any one time; 6. Minimize construction equipment idling time (e.g., 10 minute maximum);	All: SU

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
CHAPTER 4. DELTA WATER AND FISHERIES RESOURCES		
FISH-1: Construction of the DWSP intake could temporarily affect fisheries by increasing turbidity and thus degrading water quality.	**FISH-1:** Installation of the cofferdam for construction of the intake structure is expected to result in short-term increases in local suspended sediment concentrations that may affect the distribution and behavior of sensitive fish species and their habitat. To avoid and minimize these impacts, site preparation and installation of the sheet pile cofferdam will occur during the summer and fall.	Intake: LSM
FISH-2: Noise generated by in-river construction could temporarily affect the behavior and local distribution of fish and macroinvertebrates.	**FISH-2:** To avoid and minimize noise impacts to the fisheries, a vibration hammer will be used to install the sheet pile cofferdam during the summer and early fall (mid-June through mid-September).	Intake: LSM
FISH-3: Dewatering of the cofferdam during intake construction could result in stranding fish and other aquatic species.	**FISH-3:** The City will ensure that a qualified fisheries biologist will design and conduct a fish rescue and relocation effort to collect fish from the area within the cofferdam involving the capture and return of those fish to suitable habitat within the lower San Joaquin River. To ensure compliance, a fisheries biologist shall provide observation during initial dewatering activities within the cofferdam. The fish rescue plan (Appendix F) will be provided for review and comment to NOAA Fisheries, USFWS, and CDFG prior to implementation.	Intake: LSM
FISH-6: Operation of the DWSP intake facility would cause entrainment and impingement mortality of fish and macroinvertebrates.	**FISH-6a:** The City will reduce or curtail diversion operations during periods when Delta smelt larvae are present in the vicinity of the intake or exclude larval Delta smelt entrainment using an aquatic filter barrier. Either alternative 1 or alternative 2 will be selected as directed by the resource agencies and as regulated through the Biological Opinion.	Intake: LSM

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Alternative 1: The City will manage and operate the DWSP intake to reduce and avoid the increased risk of fish egg and larval entrainment during the spring months using reductions and/or curtailment in diversions. The actual reduction or curtailment period would be flexible and managed, to the extent possible, to respond to variation in the seasonal timing and geographic distribution of sensitive fish species vulnerable to entrainment into the intake. The primary focus will be on the protection of larval Delta smelt. Measures taken to protect Delta smelt would also protect Chinook salmon and other fish and macroinvertebrates. Using data from CDFG's 20-mm Delta smelt surveys, the City, in coordination with the CDFG and USFWS, will determine the potential diversion reduction or curtailment period each year, based on the geographic distribution of larval Delta smelt and its density in the immediate vicinity of the intake during the spring (April through June). Diversion operations will be managed in direct proportion to the concentration of larval Delta smelt (less than 20 mm in length) occurring in the lower San Joaquin River at CDFG's sampling stations 906, 910, and 912 during each survey. Diversion operations will range from zero to 100 percent curtailment. Based on results of CDFG's 20-mm Delta smelt surveys at approximately two-week intervals using actual survey schedules and available CDFG data, from April 1 through June 30 each year, will be used to determine curtailment/reduction. The City will maintain records and other documentation on the actual diversion operations and will provide the CDFG and USFWS a brief letter report each year documenting the curtailment of diversion operations designed to avoid and minimize the risk of fish entrainment.	

Less than Significant Impact = LS Less than Significant Impact with Mitigation = LSM Significant Unavoidable Impact= SU No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	In the event that the CDFG does not conduct the 20 mm Delta smelt surveys in any given year, the City will implement a monitoring program at the DWSP intake to determine the potential occurrence of larval Delta smelt entrainment. The entrainment monitoring program will be conducted from April 1 through June 30. Fishery sampling (entrainment monitoring) would be performed at two-day intervals to determine the densities and estimated number of larval Delta smelt in the vicinity of the DWSP intake. Sampling will occur downstream of the intake screens, using techniques similar to those employed to monitor larval fish entrainment at Contra Costa Water District's Old River intake. Based on results of the entrainment monitoring, water diversions would be reduced by 50 percent if Delta smelt larvae are present in samples collected on two consecutive sampling days. The reduction in diversions will continue until no larval Delta smelt are detected in the samples over three consecutive sampling days. These measures are designed to reduce and avoid the risk of larval Delta smelt entrainment through seasonal reductions in diversions while continuing to effectively operate the WTP. To further reduce the potential for entrainment of larval Delta smelt and other fish eggs and larvae during the spring months, the City will schedule, to the extent practicable, routine WTP maintenance outages during these months (April through June).	

Less than Significant Impact = LS Less than Significant Impact with Mitigation = LSM Significant Unavoidable Impact= SU No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Alternative 2: The City will install and maintain an aquatic filter barrier (e.g., Gunderboom's MLES™) that would serve to exclude fish eggs and larvae from entrainment into the DWSP intake from April 1 through June 30 each year. The fine-mesh curtain would completely surround the intake extending throughout the water column. The City will conduct a biological survey (fish egg and larval sampling) over the first three years of DWSP operations to demonstrate performance of the fine-mesh curtain in effectively excluding larval Delta smelt and other fish eggs and larvae from entrainment. In the event that the performance monitoring does not demonstrate that the fine-mesh curtain is effective in excluding larval Delta smelt from entrainment into the diversion, the City will implement the seasonal reduction and/or curtailment diversion operation alternative. **FISH-6b:** To minimize potential impingement of juvenile and adult fish, the City will conduct long-term monitoring and maintenance of the intake fish screens to ensure that the screens operate as intended and incidental mortality associated with diversions will conform to the goals and objectives of the project. Monitoring will include approach velocity measurements immediately after initiation of screen operations, with fine-tuning of velocity control baffles or other modifications as necessary, to achieve uniformity of velocities in conformance with the CDFG, USFWS, and NOAA Fisheries criteria (0.2 ft/sec). The City will also monitor the condition of the positive barrier screen on an annual basis, and will do periodic visual inspections to remove accumulated debris and repair screen panels as necessary. CDFG, USFWS, and NOAA Fisheries will have access to the fish screens for underwater inspections following completion of the screen construction. The standards for success will be long-term reliable operation of the fish screens, and conformance with intake screen design criteria.	

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

TABLE ES-1 (Continued)
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
CHAPTER 6. GROWTH INDUCEMENT POTENTIAL AND SECONDARY EFFECTS OF GROWTH		
GROWTH-1: Consistent with the 1990 Stockton General Plan, the DWSP would accommodate planned growth in the City, which would result in secondary environmental effects. The effects of planned growth have been identified and addressed in the EIR for the 1990 Stockton General Plan. Some of these secondary effects of growth are significant and unavoidable; others are significant but can be mitigated. Potentially significant unavoidable impacts as a result of planned growth in the City have been identified for the following areas: loss of agricultural land, loss of habitat, increased traffic and traffic congestion, air quality impacts, increased traffic noise, increased wastewater treatment demand, alteration of the region's visual character, and increased use of non-renewable fossil fuels. The DWSP would not address nor alter (improve or worsen) the other significant and unavoidable impacts, which would remain significant and unavoidable. The EIR addresses the need for additional water supply and infrastructure, groundwater overdraft, and saline groundwater intrusion as less than significant with mitigation. Mitigations for these impacts include the development and use of additional surface water sources and the reduction in dependence on groundwater. The DWSP would address these mitigations for surface and groundwater impacts.		All: SU – 30 mgd All: SU - 160 mgd

Less than Significant Impact = LS   Less than Significant Impact with Mitigation = LSM   Significant Unavoidable Impact= SU   No Impact = NI

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DRAFT PROGRAM ENVIRONMENTAL IMPACT REPORT

APPENDICES

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LIST OF ACRONYMS AND GLOSSARY

$/ccf	dollars per hundred cubic feet
AAQS	Ambient Air Quality Standards
ABAG	Association of Bay Area Governments
ACE	agricultural conservation easements
AF	acre-feet
AF/year	acre-feet per year
AF/ac/year	acre-feet per acre per year
ASR	aquifer storage and recovery
AWWA	American Water Works Association
B.P.	Before Present
BA	Biological Assesment
BACT	Best Available Control Technology
Banks Pumping Plant	Harvey O. Banks Delta Pumping Plant
Basin Plan	Water Quality Control Plan
Bay-Delta Estuary or Estuary	San Francisco Bay/Sacramento-San Joaquin Delta Estuary
bgs	below the ground surface
BMP	best management practice
BO	biological opinion
BTEX	benzene, toluene, ethylene, and xylene
Btu	British thermal units
CAA	Clean Air Act
$CaCO_3$	Calcium Carbonate
CACWD	Calaveras County Water District
CALSIM	California Simulation Model
Caltrans	California Department of Transportation
Cal Water	California Water Service Company
CARB	California Air Resources Board
CBC	California Building Code
CCFB	Clifton Court Forebay

CCR	California Code of Regulations
CCWD	Contra Costa Water District
CDEC	California Data Exchange Center
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CDOC	California Department of Conservation
CDOF	California Department of Finance
CDWA	Central Delta Water Agency
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
City	City of Stockton
CMU	Concrete Masonry Units
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
Corps	U.S. Army Corps of Engineers
COSMA	City of Stockton Metropolitan Area
County	San Joaquin County
CRCV	Coast Range-Central Valley
CRHR	California Register of Historic Resources
CSJWCD	Central San Joaquin Water Conservation District
CSLC	California State Lands Commission
CUPA	Certified Unified Program Agency
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CY	cubic yards
dB	decibels
dBA	A-weighted decibels

D/DBPR	Disinfectants and Disinfection Byproducts Rule
DBP	disinfection by-product
DCC	Delta Cross Channel
Delta	Sacramento-San Joaquin Delta
DHS	Department of Health Services
DMC	Delta-Mendota Canal
DMC-CA	Delta-Mendota Canal and California Aqueduct
DMM	Demand Management Measures
DOC	dissolved organic carbon
DOT	Department of Transportation
DSM2	Delta Simulation Model, Version 2
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
DWSP	Delta Water Supply Project
E/I	export to inflow ratio
EBMUD	East Bay Muncipal Utility District
EC	electrical conductivity
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EFH	Essential Fish Habitat
ESA	Endangered Species Act
EWA	Environmental Water Account
FEMA	Federal Emergency Management Agency
ESJCGB	Eastern San Joaquin County Groundwater Basin
ESJPWA	East San Joaquin Parties Water Authority
FMMP	Farmland Mapping and Monitoring Program
fps	feet per second
ft^2	square feet
FGA	Future Growth Areas
FRWP	Freeport Regional Water Project
FWCA	Fish and Wildlife Coordination Act
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
General Construction Permit	General Permit for Discharges of Storm Water Runoff Associated with Construction Activity
gpcd	gallons per capita per day

gpm	gallons per minute
H & H Marina	Herman & Helen's Marina
HMMP	Hazardous Materials Management Plan
HWMP	Hazardous Waste Management Plan
Hz	hertz
I-5	Interstate 5
ICBO	International Conference of Building Officials
JPA	Joint Powers Authority
km	kilometers
kV	kilovolts
kVA	kilovolt-amperes
kW	kilowatts
LAFCO	Local Agency Formation Commission
LOD	level of development
LOS	levels of service
LUST	List of Leaking Underground Storage Tank
m^3	cubic meter
M&I	municipal and industrial
MAF	million acre-feet
Management Plan	Land Use and Resources Management Plan for the Primary Zone of the Delta
MCE	maximum creditable earthquake
MCL	maximum contaminant level
MCLG	maximum contaminant level goals
µg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
µmhos/cm	micromhos per centimeter
µS/cm	microSiemens per centimeter
mgd	million gallons per day
mg/L	milligrams per liter
mm	millimeter
MOU	Memorandum of Understanding
mph	miles per hour
MRDL	maximum residual disinfectant level
MRDLG	maximum residual disinfectant level goal

MRZ	Mineral Resource Zones
Msl	mean sea level
MTBE	methyl tertiary-butyl ether
MTBM	microtunnel boring machine
MUD	Municipal Utilities Department
M_w	Moment Magnitude
MWQI	Municipal Water Quality Investigations
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NBA	North Bay Aqueduct
ND	not detected
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NIH	National Institutes of Health
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA Fisheries	National Marine Fisheries Service
NOP	Notice of Preparation
NO_X	nitrogen oxide
NOD	north of Delta
NPDES	National Pollution Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NTU	nephelometric turbidity unit
O&M	Operations and Maintenance
O_3	ozone
OCAP	Operations Criteria and Plan
OES	Office of Emergency Services
OID	Oakdale Irrigation District
OSHA	Occupational Safety and Health Administration
PEIR	Program Environmental Impact Report
PFMC	Pacific Fisheries Management Council
PG&E	Pacific Gas and Electric Company
PGA	peak ground acceleration

PM_{10}	particulate matter 10 microns in diameter
PM_{10} Plan	PM_{10} Attainment Plan
$PM_{2.5}$	particulate matter of 2.5 microns in diameter
ppm	parts per million
ppt	parts per thousand
RCRA	Resource Conservation and Recovery Act
RD-2029	Reclamation District 2029
Reclamation	U.S. Bureau of Reclamation
RMP	Risk Management Plan
ROD	Record of Decision
ROG	reactive organic gases
RWCF	Regional Wastewater Control Facility
RWQCB	Regional Water Quality Control Board
SBA	South Bay Aqueduct
SDIP	South Delta Improvement Project
SDWA	Safe Drinking Water Act
SEWD	Stockton East Water District
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SJCEHD	San Joaquin County Public Health Services, Environmental Health Division
SJCFCWCD	San Joaquin County Flood Control and Water Conservation District
SJCMD	San Joaquin County Maintenance Districts
SJCOG	San Joaquin Council of Governments
SJMSCP	San Joaquin County Multi-Species Habitat Conservation and Open Space Plan
SJV	San Joaquin Valley
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
SLIC	List of Spill and Leak Sites
SMARA	California Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SOD	south of Delta
SPCCP	Spill Prevention Control and Countermeasures Plan

SR	State Route
SSJID	South San Joaquin Irrigation District
State standards	State ambient air quality standards
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWTR	Surface Water Treatment Rule
TAC	Technical Advisory Committee
TAF	thousand acre-feet
TAF/year	thousand acre-feet per year
TAME	tertiary amyl methyl ether
TBA	tertiary butanol
TDS	total dissolved solids
THM	trihalomethanes
TOC	total organic carbon
TPH-g	total petroleum hydrocarbons as gasoline
TRB	Transportation Research Board
UBC	Uniform Building Code
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UV	ultraviolet
v/c	volume-to-capacity
Valley Air District	San Joaquin Valley Air Pollution Control District
VAMP	Vernalis Adaptive Management Plan
VPD	vehicles per day
WID	Woodbridge Irrigation District
WQCP	Water Quality Control Plan
WRCC	Western Regional Climate Center
WTP	water treatment plant
Yokuts	Northern Valley Yokuts

CHAPTER 1

INTRODUCTION

CHAPTER 1
INTRODUCTION

1.1 PURPOSE OF THE ENVIRONMENTAL IMPACT REPORT

1.1.1 INTRODUCTION

The City of Stockton (City) is proposing to develop the Delta Water Supply Project (DWSP) as a new supplemental water supply for the City of Stockton Metropolitan Area (COSMA). The City is seeking to secure a long-term supplemental surface water supply to use conjunctively with its local groundwater resources and other existing surface water supply sources. The City has applied to the State Water Resources Control Board (SWRCB) for a water rights permit to divert water from the Sacramento-San Joaquin Delta. The City's water rights application addresses a long-term planning horizon through the year 2050, requesting an ultimate diversion to 125,900 AF/year. The City proposes to construct a new water intake facility, transmission pipelines, and a water treatment plant (WTP) as part of the DWSP. The DWSP would be implemented in phases as the need for additional treated water supply develops. The first phase of the DWSP is needed immediately and is proposed for implementation in 2009. The first phase of the DWSP is designed to meet the treated water supply needs of full development (build-out) under the City's current 1990 General Plan, which is anticipated to occur by about the year 2015. The initial treatment plant capacity would be 30 million gallons per day (mgd).

The City has prepared this Draft Environmental Impact Report (EIR) to provide the public and responsible and trustee agencies with information about the potential environmental effects of the proposed DWSP. This EIR was prepared in compliance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) of 1970 (as amended), and the CEQA Guidelines (California Code of Regulations, Title 14). As described in CEQA Guidelines Section 15121(a), an EIR is a public information document that assesses potential environmental effects of the proposed project, and identifies mitigation measures and alternatives to the proposed project that would reduce or avoid adverse environmental impacts. CEQA requires that state and local government agencies consider the environmental consequences of projects over which they have discretionary authority.

CEQA requires that a lead agency neither approve nor carry out a project as proposed unless the significant environmental effects of the project have been reduced to an acceptable level, or unless specific findings are made attesting to the infeasibility of altering the project to reduce or avoid environmental impacts (CEQA Guidelines Sections 15091 and 15092). An acceptable level is defined as eliminating, avoiding, or substantially lessening the significant effects. CEQA also requires that decision makers balance the benefits of a proposed project against its unavoidable environmental risks. If environmental impacts are identified as significant unavoidable, the project may still be approved if it is demonstrated that social, economic, or other benefits outweigh the unavoidable impacts. As the CEQA lead agency, the City would then be required to state in writing the specific reasons for approving the project based on information presented in the EIR, as well as other information in the record. This process is defined as a "Statement of Overriding Considerations" by Section 15093 of the CEQA Guidelines.

The City, as the lead agency for CEQA compliance, will use this EIR to evaluate the proposed DWSP's potential environmental impacts, and can further use it to modify, approve, or deny approval of a proposed project based on the analysis provided in this EIR. Other agencies that have permit or approval authority over aspects of the DWSP will also use this EIR in their decision-making processes. Section 2.7 provides a list of these agencies and their role on this project.

1.1.2 TYPE OF EIR: PROGRAM AND PROJECT LEVEL EIR

CEQA Guidelines identify several types of EIRs, each applicable to different project circumstances. The types of EIRs include:

- A Project EIR is prepared pursuant to Public Resources Code § 21156. A Project EIR examines the environmental impacts of a specific project (CEQA Guidelines Section 15161). A Project EIR examines the environmental impacts of one, site-specific development project, covering all phases of that action, including planning, construction, operation, and reasonably foreseeable future phases. In general, a Project EIR is appropriate when sufficient information is available detailing the project, and when the project sponsors propose to proceed with the project in the near future.

- A Program EIR is prepared pursuant to CEQA Guidelines Section 15168. A Program EIR is a first-tier environmental document that assesses and documents the broad environmental impacts of a program with the understanding that a more detailed site-specific review may be required to assess future projects implemented under the program. To assist in the review of future projects, this EIR contains recommendations related to some of the analysis that will be needed in the future based on the individual project's location or type.

CEQA requires agencies not to "segment" or "piecemeal" a project into small parts, as this could avoid full disclosure of a project's environmental impacts. This rule arises from the definition of "project" under CEQA that requires agencies to analyze the effects on the "whole of the action." Many of the individual components of a project may in fact be implemented over a period of time, possibly months or even years. By preparing a Program EIR for the DWSP, the City can consider the "big picture" and cumulative effects of the plan in terms of development activities, infrastructure needs, cumulative effects, and possible growth inducement issues.

CEQA Guidelines Section 15168(c) states that subsequent activities must be examined in light of the Program EIR to determine whether an additional environmental document must be prepared. This documentation could take the form of a notice of exemption, an addendum, an initial study/ negative declaration, or a subsequent or supplemental EIR. The more comprehensive and detailed the analysis contained in the original Program EIR document, the more likely that subsequent activities will be found to be within the scope of the original Program EIR, thus eliminating or reducing the need for further environmental documentation. However, changes in the environmental setting, changes in planned facilities, and the need for site-specific assessment may still require or warrant additional environmental documentation.

The City has prepared this Program EIR for the DWSP that provides project-level impact and mitigation analysis for the initial 30-mgd phase of the project and program-level analysis for future expansion phases of the project up to 160 mgd and of the overall supplemental water supply program. The primary advantage of preparing a Program EIR for the DWSP is that it allows the City to evaluate the plan as a whole and provides a comprehensive planning document that addresses the broad and regional effects. Table 1-1 provides a brief summary of the key project components and what is proposed for construction and operation initially and ultimately.

TABLE 1-1
CEQA PROJECT-LEVEL AND PROGRAM-LEVEL ANALYSIS OF DWSP COMPONENTS IN THE EIR

DWSP PROJECT COMPONENT	INITIAL PROJECT (30 MGD)	ULTIMATE PROJECT (160 MGD)
	Project-Level CEQA Review	Program-Level CEQA Review
Delta Intake / Fish Screens Facility - In-bank facility - In-river facility	Foundation (piles) may or may not be installed for a 160-mgd facility. Intake structure (shell) constructed for an 80-mgd intake facility. Operational for only 30 mgd (equipment only installed for 30-mgd facility).	Intake structure expanded up to a 160-mgd intake facility. Phased, incremental expansion of operational capability from 30 mgd to 160 mgd.
Raw Water Pipelines from Intake Facility to WTP	Construct 66,700 feet of 54-inch diameter pipeline	Construct 66,700 feet of 72-inch diameter pipeline parallel to initial 54-inch pipeline.
WTP	Acquire, grade, and fence site for ultimate 160 mgd WTP. Construct and operate 30-mgd WTP.	Phased, incremental expansion of treatment plant capacity from 30 mgd up to 160 mgd.
Electrical Power Supply	Extend/upgrade power supply to intake facility and WTP.	Upgrade power supply to expanded WTP if needed as part of future expansion phases.
Treated Water Pipeline(s) between WTP and City's Distribution System	One to three pipelines from WTP to existing City distribution system.	Additional pipelines determined to be needed.
Groundwater Recharge – Aquifer Storage and Recovery (ASR)	In-lieu (natural) recharge. Possible pilot study to assess feasibility and site suitability for groundwater injection.	Feasibility study and potential future implementation of groundwater injection and extraction (ASR program).

As highlighted in this table, this EIR provides project-level analysis of the initial 30-mgd phase of the project and program-level analysis of the future expansion increments of the project up to 160 mgd. Chapter 2, Project Description, provides a detailed discussion of the proposed DWSP, including initial and ultimate capacity and initial and ultimate facilities and operation. Chapter 2 also provides a detailed discussion of each project component.

For the initial phase of the DWSP, it is intended that this EIR provides full project-level analysis of construction and operation of proposed facilities, and that with EIR certification the City can move forward with approval for construction and operation of the initial facilities. For all future phases, it is expected that the City will review the impact analysis for project expansion in this EIR and determine whether and what level of additional CEQA documentation and review is appropriate to adequately address proposed DWSP expansion. Because future facilities would not be constructed for up to 10 years or more, supplemental CEQA analysis may be necessary prior to project expansion. Future changes in conditions or circumstances may also require supplemental CEQA analysis beyond that provided in this EIR for future facilities. As appropriate, when the City proposes to expand the DWSP, it will process additional CEQA documentation that builds on the analysis presented in this Program EIR.

1.2 CEQA EIR PROCESS

1.2.1 INITIAL STUDY AND NOTICE OF PREPARATION

In accordance with Sections 15063 and 15082 of the CEQA Guidelines, the City prepared a Notice of Preparation (NOP) of an EIR and published it on November 14, 2003. The NOP was circulated to the public, local, state and federal agencies, and other interested parties to solicit comments on the proposed project. In addition to the 30-day comment period, two separate public scoping sessions were held on December 8, 2003 at the Cesar Chavez Central Library in Stockton. Concerns that were raised in response to the NOP and oral comments received at the scoping sessions were considered during preparation of this EIR. The NOP and the comment letters received on the NOP are presented in Appendix A.

1.2.2 DRAFT EIR

This document constitutes the Draft Program EIR for the proposed DWSP. The Draft Program EIR contains a description of the project, description of the environmental setting, identification of project impacts, mitigation measures for impacts found to be significant, and an analysis of project alternatives.

1.2.3 PUBLIC REVIEW

This document is being circulated to local, state, and federal agencies and to interested organizations and individuals who may wish to review and comment on the report. Publication of this Draft Program EIR marks the beginning of a 45-day public review period. A public hearing on the Draft EIR will be held by the City during the public review period. During this review period, written comments will be received by the City at the following address:

David Stagnaro
City of Stockton
c/o Community Development Department, Planning Division
425 North El Dorado Street
Stockton, CA 95202-1997

Copies of the Draft EIR will be available for public review at the following locations:

Cesar Chavez Central Library
605 N. El Dorado Street
Stockton, CA 95202

M. K. Troke Library
502 W. Benjamin Holt Drive
Stockton, CA 95207

Fair Oaks Library
2730 East Main Street
Stockton, CA 95205

The Draft EIR will also be available on the City's website at http://www.stocktongov.com.

1.2.4 FINAL EIR AND EIR CERTIFICATION

Written and oral comments received on the Draft EIR will be addressed in a Response to Comments document which, together with the Draft EIR and changes and corrections to the Draft EIR, will constitute the Final EIR. After review of the project and the Final EIR, the City, at a public hearing, will decide whether to certify the Final EIR and whether to approve or deny the project.

If the City approves the project, even though significant impacts identified by the EIR cannot be mitigated, the City must state in writing the reasons for its actions in a Statement of Overriding Considerations that must be included in the record of the project approval and mentioned in the Notice of Determination (CEQA Guidelines Section 15093[c]).

1.2.5 MITIGATION MONITORING AND REPORTING PROGRAM

CEQA Section 21081.6(a) requires lead agencies to "adopt a reporting and mitigation monitoring program for the changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment." The specific "reporting or monitoring" program required by CEQA is not required to be included in the EIR. Throughout the EIR, however, mitigation measures have been clearly identified and presented in language that will facilitate establishment of a monitoring and reporting program. Any mitigation measures adopted by the City as conditions for approval of the project will be included in a Mitigation Monitoring and Reporting Program to verify compliance.

1.3 EIR ORGANIZATION

This Draft EIR is organized into ten chapters as discussed below.

Executive Summary. The Executive Summary presents a summary of the project description, a description of issues to be resolved, the significant environmental impacts that would result from project implementation, and mitigation measures proposed to reduce or eliminate those impacts.

Chapter 1, Introduction. Chapter 1 describes the purpose and organization of the EIR and the EIR preparation, review, and certification process.

Chapter 2, Project Description. Chapter 2 describes the project background, outlines the project objectives, and summarizes the components of the proposed DWSP. The project description also describes subsequent development and approvals for which this EIR may be used.

Chapter 3, Environmental Analysis – Project Facilities. Chapter 3 describes the existing environmental setting for each environmental issue area, discusses the environmental impacts associated with construction and operation of the proposed DWSP facilities, and identifies mitigation measures for potential impacts.

Chapter 4, Delta Water Resources and Fisheries. Chapter 4 discusses the water resources in the Sacramento-San Joaquin Delta available for the City's water supply, and potential impacts to these resources resulting from the construction and operation of the water intake facilities. This chapter also addresses the potential impacts on fish and other aquatic resources that could result from the construction and operation of the proposed DWSP.

Chapter 5, Groundwater Resources. Chapter 5 provides a discussion of groundwater resources in the project area as characterized by groundwater elevation trends and groundwater quality. This chapter also identifies potential impacts to these groundwater resources resulting from construction and operation of the proposed DWSP.

Chapter 6, Growth Inducement Potential and Secondary Effects of Growth. Chapter 6 discusses the potential for the proposed DWSP to induce urban growth and development. Secondary effects of growth, including conversion of agricultural lands, are also discussed in this chapter.

Chapter 7, Alternatives Analysis. Chapter 7 describes alternatives to the proposed DWSP at a level of detail consistent with CEQA requirements. Alternatives to the proposed project are not analyzed at the same level of detail as the proposed project; they are presented in order to identify options that could mitigate environmental impacts.

Chapter 8, Other CEQA Issues. Chapter 8 discusses several issues required by CEQA, including discussions of potential cumulative impacts, significant unavoidable impacts on the environment, and significant irreversible environmental changes.

Chapter 9, EIR Authors and Persons Consulted. Chapter 9 provides the names of the EIR authors and consultants, and agencies or individuals consulted during preparation of the EIR.

Appendices. Appendices A through F consist of materials that expand upon the content of the above listed chapters.

CHAPTER 2

PROJECT DESCRIPTION

CHAPTER 2
PROJECT DESCRIPTION

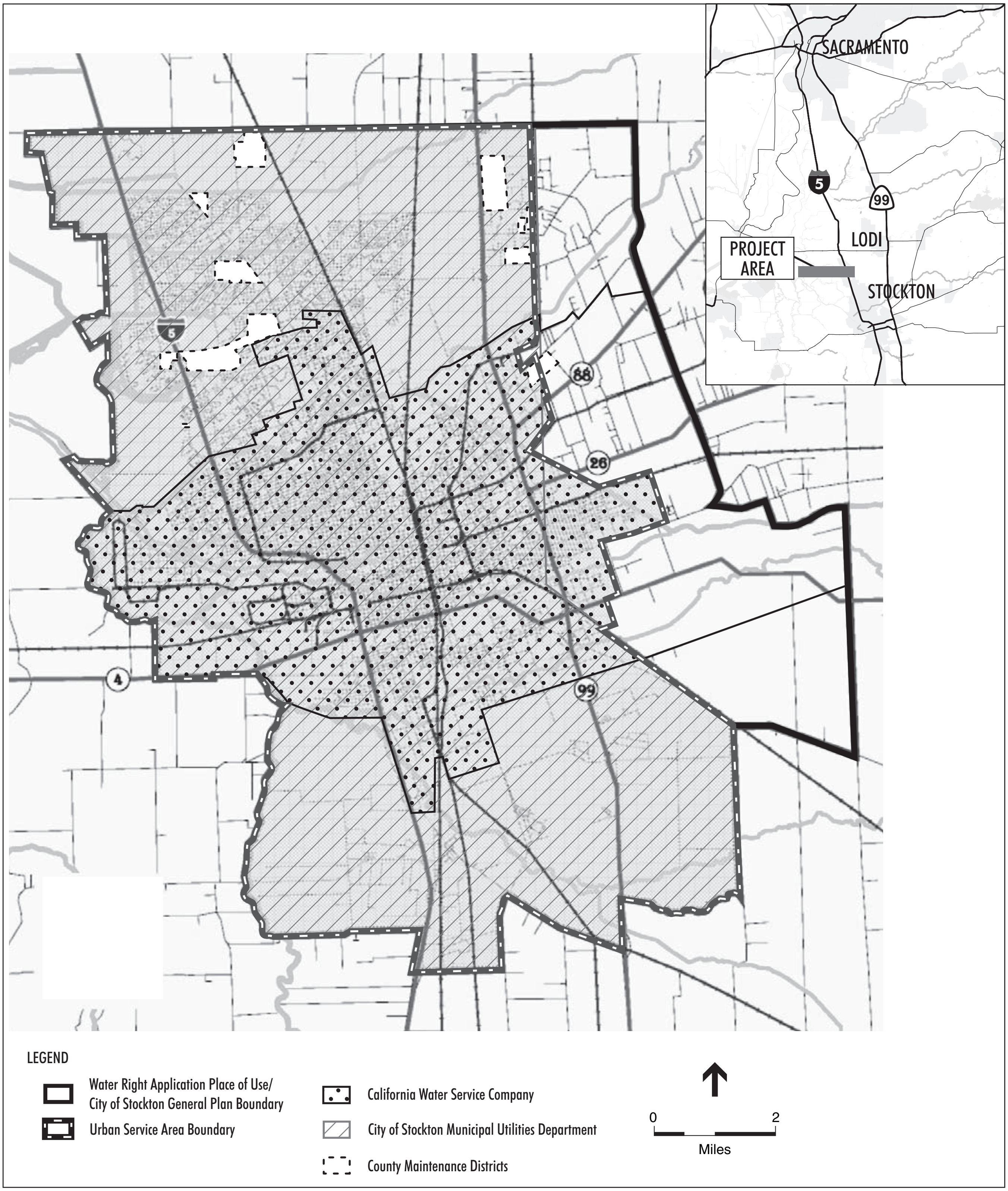
2.1 PROJECT OVERVIEW

The City of Stockton Metropolitan Area (COSMA)[1] (Figure 2-1) is currently experiencing substantial population growth and increasing water demands. Existing contracted surface water supplies to the COSMA are limited and interim in duration. In addition, groundwater conditions in the Eastern San Joaquin Groundwater Basin are threatened primarily by groundwater withdrawals to the east of the COSMA, which has resulted in saline water intrusion under the western portions of the COSMA. For these reasons, the City proposes to develop a new supplemental water supply for the COSMA – the Delta Water Supply Project (DWSP). On January 6, 1996, the City submitted a water rights application to the State Water Resources Control Board (SWRCB) to secure rights to divert surface water from the Sacramento-San Joaquin Delta (Delta). The City's water rights application addresses a long-term planning horizon through the year 2050, requesting an ultimate diversion to 125,900 AF/year. Initially the DWSP would divert about 33,600 AF/year to meet very near-term demands through approximately 2015 (10-year horizon).

The DWSP is proposed as a conjunctive use program that would integrate surface water and groundwater management. The surface water component of the DWSP would include an intake facility with fish screens on the San Joaquin River, new pipelines to convey Delta water to a new water treatment facility located just north of the COSMA, and treated water pipelines to deliver water to the City's existing water distribution system. Existing interties with the California Water Service Company (Cal Water) would be used to distribute DWSP treated water throughout Cal Water's service area within the COSMA (Figure 2-1). The groundwater component would include coordinated groundwater and surface water management. Initially groundwater levels would be allowed to recover by in-lieu (natural) recharge. Ultimately treated Delta surface water would be injected into the groundwater basin underlying the COSMA, for later extraction during periods of limited surface water supply.

The DWSP would be expanded in increments to keep pace with the COSMA's needs based on the timing of existing supply reductions and increased demand over time. The target date for the initial operation of the DWSP Water Treatment Plant (WTP) is 2009. Initially the DWSP would

1 The City of Stockton 1990 General Plan has a Planning Area Boundary that is used as the outermost boundary for the General Plan analyses. This boundary is the same boundary used in the water rights application as the Place of Use boundary. It is also the boundary used to define the areal extent of the COSMA. Within the 1990 General Plan boundary is an Urban Service Boundary, which contains planned urban land uses that are expected to receive municipal services such as a water supply.



SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-1
Water Right Application Place of Use/
City of Stockton General Plan Boundary

be sized with a WTP capacity to treat and deliver up to 30 mgd (33,600 AF/year) of water.

The City would initially continue to rely on surface water and groundwater supplies to meet local needs. With implementation of the DWSP, the City would pump less groundwater and the groundwater levels would be allowed to recover by in-lieu recharge. After the development of the 30 mgd facility, the City will consider the need for an ASR program to optimize use of Delta water in periods when supply exceeds demand. Initially the City would study and implement a pilot program to test the feasibility of an ASR program and define the potential location of injection/extraction wells.

The capacity of the WTP would be expanded in increments to keep pace with water needs based on the timing of existing supply reductions and increased demand over time. Ultimately by about 2050, the WTP would be expanded to treat 160 mgd of surface water up to the maximum water rights request of 125,900 AF/year.

2.1.1 PROJECT LOCATION

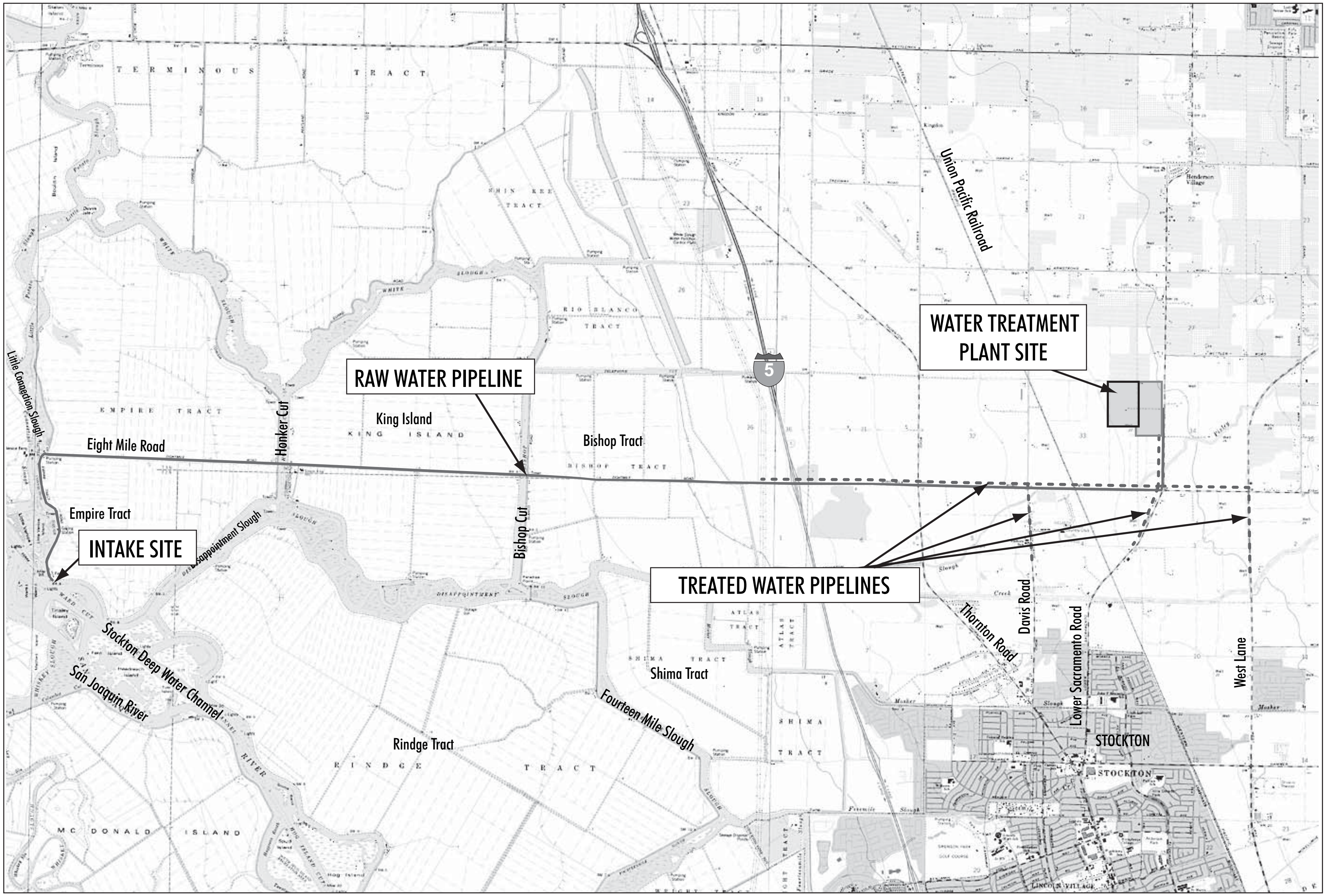
The DWSP intake site would be located on the San Joaquin River, with the raw water pipelines connecting to a WTP just north of Stockton, California as shown on Figure 2-2. The proposed location for the intake site is on the southwest tip of Empire Tract adjacent to the Stockton Deep Water Ship Channel. The proposed raw water pipelines would extend from the intake and parallel the Empire Tract levee (about 250 feet east of the levee centerline) to Eight Mile Road, where they would turn east and parallel the north side of Eight Mile Road to Pixley Slough. The alignment then would turn north, parallel Pixley Slough to the west side of Lower Sacramento Road, and finally north to the proposed WTP site. The proposed WTP site is located on the west side of Lower Sacramento Road, just north of the City and approximately three miles east of Interstate 5 (I-5) on a 126-acre parcel. The WTP would occupy approximately 56 acres along the western side of the parcel. The treated water pipeline would parallel the east side of Lower Sacramento Road south to the south side of Eight Mile Road. From the intersection of Lower Sacramento and Eight Mile Roads, the pipeline would go south along Lower Sacramento Road, and east and west along Eight Mile Road to connect with the existing City and Cal Water distribution systems.

2.2 PROJECT OBJECTIVES AND WATER SUPPLY NEEDS

2.2.1 PROJECT OBJECTIVES

The City has conducted a comprehensive feasibility study to evaluate potential sources of supplemental water supply to meet the long-term water needs for the COSMA (Stockton MUD et al., 2003). Development of a Delta surface water supply was identified as the preferred alternative to meet the City’s water supply needs and objectives. These objectives are:

- To replace declining and unreliable surface water supplies.
- To protect and restore groundwater resources.
- To provide adequate water supply to accommodate planned growth.



SOURCE: USGS 7.5 Minute Quadrangles (Bouldin Island, Terminous, and Lodi South); and Environmental Science Associates, 2004

Figure 2-2
Project Location

The primary purpose of the proposed DWSP is to provide a secure, reliable supplemental supply of water for the COSMA to meet the current and future water needs while reducing dependence on groundwater. These project objectives are discussed below.

2.2.2 REPLACE DECLINING AND UNRELIABLE SURFACE WATER SUPPLIES

The retail water purveyors in the COSMA include the City of Stockton Municipal Utilities Department (Stockton MUD); the California Water Service Company (Cal Water), a privately owned utility; and San Joaquin County (through the Lincoln Village and Colonial Heights Maintenance Districts). These purveyors meet municipal water demands by pumping groundwater from the underlying groundwater basin and by purchasing surface water from Stockton East Water District (SEWD). Agricultural users within the COSMA primarily rely on groundwater; however they divert minor amounts of surface water. Figure 2-1 identifies the service area of these agencies within the City's 1990 General Plan Boundary.

Until 1977, groundwater was the sole source of domestic water for the Stockton area. A surface water supply was established in 1977, when the SEWD WTP began operation. SEWD holds contracts for up to about 145,000 AF/year. SEWD receives surface water from three sources:

- Calaveras River via New Hogan Reservoir pursuant to a contract between the U.S. Bureau of Reclamation (Reclamation), Calaveras County Water District (CACWD), and SEWD: contract "safe" yield 40,171 AF/year.

- Stanislaus River via New Melones Reservoir pursuant to a contract between Reclamation and SEWD: up to 75,000 AF/year.

- Interim Water Transfers from the Oakdale Irrigation District (OID) and the South San Joaquin Irrigation District (SSJID): up to 30,000 AF/year.

On average, SEWD receives approximately 10,000 AF/year for M&I use from the Calaveras River, including water not currently being used upstream by CACWD. This source of surface water may not be a reliable long-term supply for SEWD as Calaveras County continues to develop and require additional water supplies, and due to possible dedication of instream flows to fishery restoration in the lower Calaveras River.

In 1983, SEWD contracted with Reclamation for an interim water supply from the New Melones Reservoir to be delivered at Goodwin Dam on the Stanislaus River. To access this supply, SEWD constructed the Farmington Canal, to connect Goodwin Dam to the SEWD WTP. However, implementation of the Central Valley Project Improvement Act (Public Law 102-575) and other regulatory actions has limited the amount of water SEWD could expect from New Melones Reservoir. Under the New Melones Interim Plan of Operations deliveries to SEWD are limited to a maximum of 10,000 AF/year. This source of surface water is not a reliable long-term supply because SEWD holds an interim contract that expires at the end of 2022, and may not be renewed.

Through interim water transfer contracts with Oakdale Irrigation District (OID) and the South San Joaquin Irrigation District (SSJID), SEWD can receive up to 30,000 AF/year from the Stanislaus River during wet years. The actual amount of water SEWD receives is dependent on the April forecasted inflow to New Melones Reservoir. The minimum amount of water available is 8,000 AF/year during dry years. Additionally the current agreement expires in 2009, with an optional extension for up to 10 additional years. OID and SSJID each contribute one-half of the total transfer amount. If an extension is granted by OID and/or SSJID, then according to the current contract, this surface water supply would only be available until 2019. Even though the City plans to negotiate for the renewal of the contract, for planning purposes the City has assumed that only one contract would be renewed in 2009, with a maximum transfer amount of 15,000 AF/year. The City has also assumed that no transfer water would be available beyond 2019. Consequently, this source of surface water is not a reliable long-term supply for SEWD.

Table 2-1 lists the SEWD surface water sources assumed to be available to the City. In the future, surface water availability to SEWD (and hence the City) is projected to decrease as water

TABLE 2-1
EXISTING SEWD WATER SOURCES AND CRITICAL YEAR AVAILABILITY

Source	Annual Contract Amount (AF/year)	Projected "Critical Year" Annual Availability (AF/year) — Planning Year				
		2000	**2010**	**2020**	**2035**	**2050**
Reclamation – New Hogan Water Supplies	40,171 ("safe" yield)	21,000	20,000	19,000	19,000	19,000
Reclamation – New Melones Interim Water Contract and Section 215 "Spill" Water	Total Contract 75,000	Not Available in Dry Years				
SSJID Transfer – Stanislaus River[2]	15,000	4,000	0	0	0	0
OID Transfer – Stanislaus River	15,000	4,000	4,000	0	0	0
TOTAL	**Total 145,171**	**29,000**	**24,000**	**19,000**	**19,000**	**19,000**

Notes: 1. The contract specifies a safe yield of 84,100 AF/year; 13,000 AF/year is allocated to existing water right holders on the Calaveras River. SEWD has a right to 56.5 percent of the remainder, and CACWD has rights to 43.5 percent of the remainder. CACWD currently uses approximately 3,500 AF/year of its allocation. Based on an agreement between CACWD and SEWD, SEWD currently has use of the unused portion of CACWD's allocation. Priority is given to agricultural use for the initial 25,000 AF/year.
2. For planning purposes, it was assumed that SSJID would not continue its water transfer to SEWD past 2009.
M&I = Municipal and Industrial
Ag = Agriculture
SOURCE: MWH, 2005

transfers with SSJID and/or OID expire in 2009 and 2019, and as CACWD increases its use of Calaveras River water. By 2020, supply availability to SEWD from its current surface water supplies will be reduced to about 19,000 AF/year in a critical dry year [2]. The operation of the proposed DWSP would meet the need for a dependable surface water supply and would resolve the loss and uncertainty of these surface water supplies.

In addition to water supply reductions resulting from reduced contract deliveries, the City is also subject to further groundwater supply reductions resulting from shutting down groundwater wells that fail to meet current and future water quality standards, such as those for arsenic. Arsenic is a naturally occurring element in the geologic deposits in the project area. Groundwater that flows over these deposits may become contaminated with arsenic, which then makes its way into public and private drinking water wells.

In 2001, the U.S. Environmental Protection Agency (USEPA) lowered the existing federal Maximum Contaminant Level (MCL) for arsenic from 50 micrograms per liter (µg/L) to 10 µg/L. All water systems must comply with this standard by January 23, 2006. California's current arsenic standard is 50 µg/L. State law requires the California Department of Health Services (DHS) to establish an MCL for arsenic at a level that is equal to or more stringent than the USEPA's standard and set as close as technically and economically feasible to arsenic's Public Health Goal (PHG). A PHG is the level of arsenic in drinking water that would not pose a significant human health risk. In 2004, the DHS set the PHG for arsenic at 0.004 µg/L. The DHS has discussed setting the state standard anywhere from 4 to 10 µg/L. The new state MCL will take effect in January 2006, in conformance with the requirements associated with the federal MCL for arsenic.

Stockton MUD extracts approximately 40 percent of its water supply from 33 operable groundwater wells, which meet current arsenic standards. Twenty five of the 33 wells will meet the new 10 µg/L arsenic standard. Eight wells have arsenic concentrations above 10 µg/L. The City of Stockton is currently evaluating treatment alternatives for these eight wells to meet the new arsenic standards (City of Stockton and OMI Thames Water, 2004).

Cal Water extracts approximately 45 percent of its water supply from a network of 37 operable groundwater wells located throughout Stockton. Sixteen of the 37 wells have arsenic concentrations above 10 µg/L; an additional well has an arsenic concentration of 9 µg/L that is expected to increase to 10 µg/L or greater based on historic data. Cal Water is currently evaluating a blending plan (MWH, 2004).

If DHS sets the new standard at 4 µg/L, additional wells will be affected. Stockton MUD will have 25 wells of its 33 wells with arsenic concentrations greater than 4 µg/L and eight wells producing supplies within the new standard (DHS, 2004). Cal Water will have 31 wells of its 37 wells with arsenic concentrations greater than 4 µg/L, three wells with concentrations of 4 µg/L, and three wells with concentrations less than 4 µg/L within the new standard (MWH, 2004).

[2] A dry year in which the full commitments for a dependable water supply cannot be met and deficiencies are imposed on water deliveries.

In order to meet the potential future arsenic standards, these wells will need either extensive retrofitting, source blending, or other treatment to achieve acceptable arsenic levels in the drinking water. It is expected that to achieve acceptable arsenic levels, there will be a loss in available well capacity and a significant increase in investment.

The proposed DWSP would provide a source of surface water that would decrease the City's reliance on groundwater and at the same could be used for blending of the groundwater that remains in use. As a result the DWSP would provide the City with a better quality of drinking water.

2.2.3 PROTECT AND RESTORE GROUNDWATER RESOURCES

Groundwater elevations in the vicinity of the COSMA have declined between 40 to 60 feet over the last 20 to 30 years. A cone of depression [3] has formed in eastern San Joaquin County creating a gradient that allows saline water underlying the Delta region to migrate northeast into the southern portions of the COSMA. Refer to Chapter 5, Groundwater Resources of this EIR and Stockton MUD et al. (2003) for a more detailed discussion on the groundwater resources.

Since the late 1970s, saline water from the west has intruded into the COSMA, threatening groundwater quality especially in dry years when groundwater is in demand. Saline intrusion can degrade water quality, threaten the long-term productivity of the groundwater basin, and compromise the future of the groundwater basin as a source of municipal water supply. Because of ongoing saline water intrusion, reliance on groundwater alone to meet existing and future water demands is not feasible.

Groundwater currently comprises approximately 40 percent of the COSMA's total water supply. During dry years when surface water availability is limited, groundwater pumping increases to meet municipal demands. In water year 2001/2002, 27,400 AF of groundwater and 38,300 AF of surface water were used to meet municipal demands totaling 65,700 AF within the COSMA. Within the Urban Service Area (Figure 2-1) of the City's 1990 General Plan Boundary an average of 44,000 AF/year of groundwater was pumped: 27,400 AF/year for municipal use and about 17,000 AF/year for agricultural use. Based on available monitoring data, the current extraction appears to be at or slightly above the sustainable yield of the groundwater basin.

An objective of the proposed DWSP is not only to protect current groundwater supplies, but also to help renew and restore groundwater resources and deter further saltwater intrusion. By implementing the DWSP, the groundwater basin would naturally benefit through in-lieu recharge. The reductions in pumping as a result of the DWSP would allow the groundwater basin to naturally recover through recharge from the rivers and deep percolation.

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3 A cone-shaped depression in the groundwater table around a well or a group of wells. The cone is created by withdrawing ground water more quickly than it can be replaced.

2.2.4 PROVIDE ADEQUATE WATER SUPPLY TO ACCOMMODATE PLANNED GROWTH

PLANNED INCREASE IN DEMAND

Between 1994 and 2001, the water demands in the COSMA have steadily increased from about 55,000 AF/year to 66,000 AF/year, of which about 60 percent is supplied by surface water. Much of the increase in demand is due to new development in accordance with the City's 1990 General Plan Boundary. Based on projected municipal water use, approximately 85,000 AF/year will be needed by about 2015 (Table 2-2). The projected municipal water use in the COSMA in the year 2050 is expected to be about 178,000 AF/year (Table 2-3).

Based on current available water supplies, the City will face water supply shortfalls into the future (with or without new development). Figure 2-3 shows the near-term water demands representing build-out of the current 1990 General Plan urban land uses projected to occur by about 2015, and the long-term water demands representing a population growth of 1.9 percent per year up to the year 2050. If only one of the SSJID and OID temporary water supply contracts is renewed between 2009 and 2019 and growth occurs, the City would need an average of 7,000 AF/year by 2015 of additional surface water supply to limit groundwater pumping to the safe yield objectives for the basin. If population growth continues at a rate of 1.9 percent per year,

TABLE 2-2
PROJECTED FUTURE WATER DEMANDS

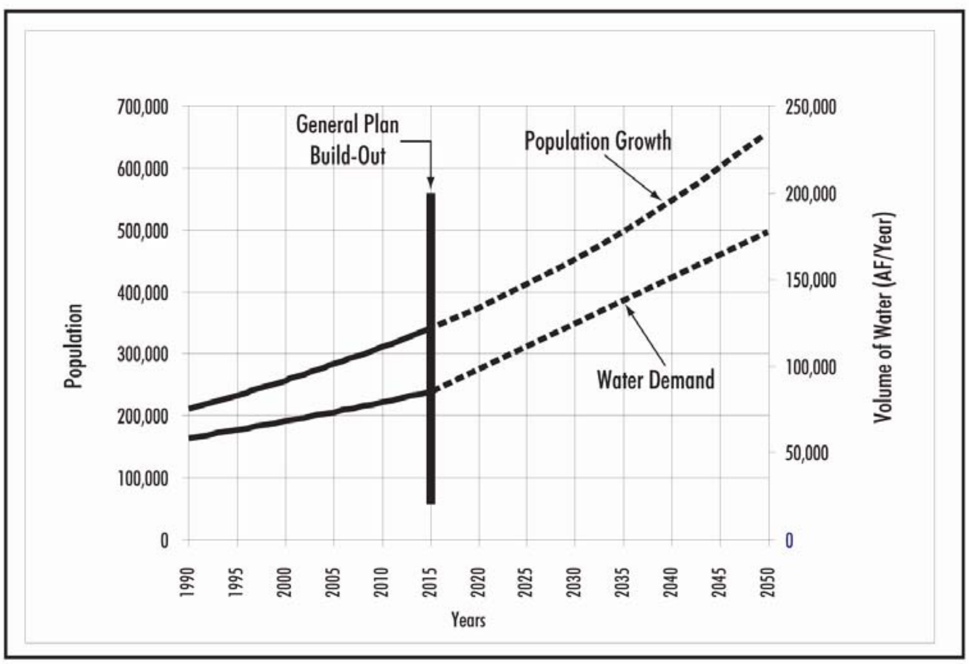
1990 General Plan Land Use Designation	Unit Factor (AF/ac/year)	1990 General Plan Area/ Water Rights Application Place of Use (acres)	Urban Service Area (acres)	Municipal Water Demands at 2015 (AF/year)
Low-Medium Density Residential	1.5	31,222	31,222	47,872
High-Density Residential	3.0	1,368	1,368	4,104
Administrative Professional	1.5	841	841	1,266
Commercial	1.5	3,776	3,776	5,749
Performance Industrial/Industrial	1.5	9,582	9,582	14,020
Institutional	1.5	6,648	6,648	10,235
Park and Recreational	2.0	1,042	1,042	2,084
Agricultural/Open Space	-	27,585	11,525	-
TOTAL:		**82,064**	**66,004**	**85,330**

SOURCE: Stockton MUD et al., 2003

TABLE 2-3
PROJECTED COSMA WATER DEMANDS

Year	Average Annual Demand (AF/year)	Year	Average Annual Demand (AF/year)
2003	71,369	2012	81,603
2004	72,439	2013	82,827
2005	73,526	2014	84,069
2006	74,629	2015	85,330
2007	75,748	2020	98,575
2008	76,885	2025	111,821
2009	78,038	2030	125,066
2010	79,208	2035	138,312
2011	80,397	2050	177,900

SOURCE: Stockton MUD et al., 2003



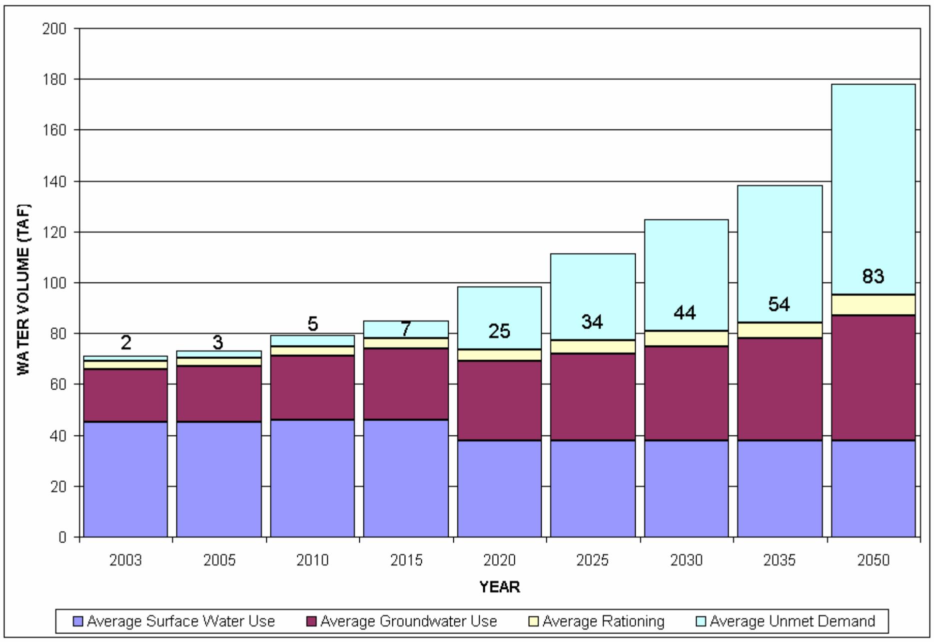
SOURCE: COSMUD et al., 2003; and Environmental Science Associates, 2004

Delta Water Supply Project / 200090-002

Figure 2-3
Population and Water Demand Projections

supplemental water needs would average 34,000 AF/year by 2025, and average up to 83,000 AF/year in 2050 (Figure 2-4). However, actual unmet demands could be greater in individual years. Figure 2-4 summarizes the average unmet water demand without the DWSP; groundwater is assumed to be limited to the target yield.

FIGURE 2-4
SUMMARY OF AVERAGE UNMET WATER DEMAND WITHOUT DWSP



Note: Assumes groundwater limited to target yield

CONSERVATION AND RECYCLING PROGRAMS

In an effort to improve water use efficiency, the City has implemented an aggressive water conservation program consistent with the California Urban Water Conservation Council Memorandum of Understanding (MOU). The *Urban Water Management Plan 2000 Update, Public Review Draft* describes and illustrates the continuing implementation of demand management programs within the COSMA (Stockton MUD, 2000). Table 2-4 summarizes these activities. In addition to complying with most of the 16 Best Management Practices addressed in the MOU, the City, which is fully metered, has adopted a Water Conservation Ordinance with permanent water usage restrictions and a stringent dry year rationing program providing for deep mandatory reductions in the event of water supply shortages.

The City also owns and operates the Stockton Regional Wastewater Control Facility (RWCF) that currently discharges about 29,000 AF of treated effluent per year into the San Joaquin River. The City has investigated the potential for recycling effluent for non-potable uses (Carollo Engineers, 1996). Various industrial, municipal, agricultural, and groundwater recharge options were considered. Treated wastewater from the RWCF would be stored and used for non-potable uses such as landscape and median irrigation, agricultural supply, industrial supplies. The study

TABLE 2-4
COSMA WATER DEMAND MANAGEMENT MEASURES (DMMs)

ID	DMM	Description	Implementation/ Effectiveness
DMM 1	Water Survey Programs for Residential Customers	Audits of interior and exterior residential water use. A form is filled out for each audit identifying the type of water connection, number of occupants, and the results of the audit.	Water savings due to educational, audit, retrofit, and detection programs are not quantified. Total savings from all programs since 1987 is estimated to be 12,751 AF/year (20% of current demands).
DMM 2	Residential Plumbing Audit	Voluntary residential retrofit program for plumbing fixtures including showerheads, low flow faucet aerators, toilet dams, dye tablets, and water savings tips. Audits are typically performed at the same time a kit is provided.	See DMM 1
DMM 3	System Water Audits, Leak Detection and Repair	Audits of water distribution system to determine unaccounted water. Unaccounted water is determined based on the difference between water introduced into the system from either SEWD or groundwater and water metered for each customer. Unaccounted water is tracked to determine whether it was used or lost due to leaks in the water system.	As of 1999, system losses were averaging 3.9% of the total water supply. This is considerably lower than communities with similar age and size of water systems where losses can be higher than 7.5%. See DMM 1 for quantified benefit.
DMM 4	Metering and Commodity Rates	Metered billing of water use. Customers are classified by meter type including single family, multi family, commercial, institutional, and irrigation accounts.	See DMM 1
DMM 5	Large Landscape Conservation Programs and Incentives	The COSMA has adopted a landscape ordinance that calls for 75% of the plants selected in non-turf areas to be drought tolerant and that water for fountains and water features be recirculated.	See DMM 1
DMM 6	High Efficiency Washing Machine Rebate Programs	Rebates offered for the purchase of high efficiency washing machines.	This measure has not been implemented.
DMM 7	Public Information Programs	Public information disseminated in the form of bill inserts, brochures, community speakers, advertising, web page, and special events.	See DMM 1
DMM 8	School Education Programs	Outreach educational programs stress the importance of water conservation. Award winning Sally-Save-Water Awareness Program uses a 50s style character to teach children and adults how important it is to eliminate at least one water wasting habit from their life.	The Sally-Save-Water message has been heard in over 1,200 classrooms.

TABLE 2-4 (Continued)
COSMA WATER DEMAND MANAGEMENT MEASURES

ID	DMM	Description	Implementation/ Effectiveness
DMM 9	Conservation Programs for Commercial, Industrial, and Institutional Accounts	Residential programs including audits, retrofits, and metering are applied to all commercial, industrial, and institutional accounts as well.	See DMM 1
DMM 10	Wholesale Agency Programs	The COSMA contracts with SEWD for surface water supplies and meets regularly to discuss water-related matters.	See DMM 1
DMM 11	Conservation Pricing	The COSMA maintains a uniform water pricing structure in dollars per hundred cubic feet ($/ccf). One exception is for large industrial customers where a declining rate is applied for uses greater than 300 hundred cubic feet per month.	See DMM 1
DMM 12	Water Conservation Coordinator	The COSMA's Water Conservation Coordinator coordinates all consultant contracts for public outreach and education, media advertisements, and other special services as needed.	See DMM 1
DMM 13	Water Waste Prohibition	By ordinance the COSMA can restrict certain uses of water yearly between May 1 and November 1.	See DMM 1
DMM 14	Residential Ultra-Low-Flush Toilet Replacement Programs	Rebates offered for the replacement of old high water use toilets with ultra-low flush toilets.	This program is currently not being conducted by the COSMA.

SOURCE: Stockton MUD, 2000

indicated that up to 61 TAF/year of recycled water could be available for recycled uses at the ultimate build-out of the 55-mgd RWCF (Carollo Engineers, 1996).

However, the major problem found with the municipal and agricultural reuse alternatives was that they would be seasonal in nature, which could result in cost-prohibitive land acquisition and storage lagoon construction costs for the required wet season storage of the effluent. In addition, the study indicated that there was lack of widespread support for a recycled water program among area farmers because of concerns regarding the limited number of crops that could use recycled water.

Industrial reuse was also studied. However, sufficient industrial demand could not be identified, thus ruling out industrial reuse as a short-term option. The groundwater recharge options included a significant number of uncertainties, and would not ensure a reduction in treatment requirements and associated costs. In addition, an extensive network of recycled water distribution lines would need to be installed throughout the City's service area to deliver the water for reuse. Therefore, effluent reclamation was not considered a viable alternative to continued river discharge of RWCF effluent.

The use of a water recycling program would not provide potable water supplies for the COSMA. Although recycling could potentially reduce the use of potable supplies by using recycled water for certain specific uses, it would not meet the long-term objectives proposed for the DWSP.

DEFICIENCIES OF FUTURE WATER SUPPLIES

Figures 2-5a through 2-5e illustrate future water demand and surface water supplies available to serve users within the COSMA during wet, above normal, below normal, dry, and critical years. The demand curves in Figures 2-5a through 2-5e reflect the projected increase in water demand through 2050. Demands are reduced in the dry and critical years to reflect the City's drought contingency rationing plan.

Conservative assumptions were used in projecting the availability of surface water in future years, as presented in Figures 2-5a through 2-5e.. In dry years, SEWD's contract with Reclamation for New Melones Reservoir water supplies, and water transfers from OID/SSJID are expected to decrease; thus, increasing SEWD's dependence on its New Hogan Reservoir contract supplies.

FIGURE 2-5
COSMA WATER SUPPLY SOURCES AND AVAILABILITY

Figure 2-5a
Wet Years

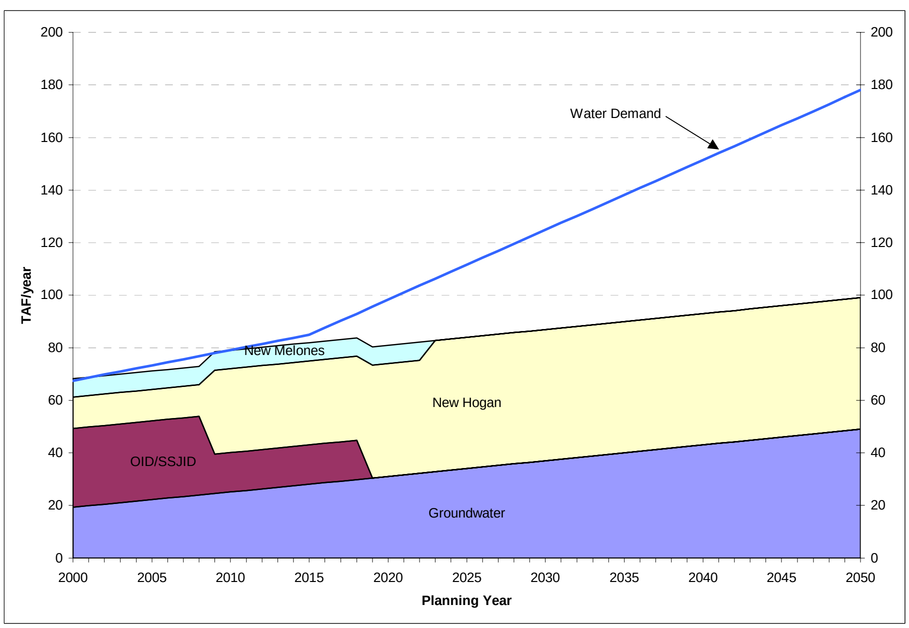


Figure 2-5b
Above Normal Years

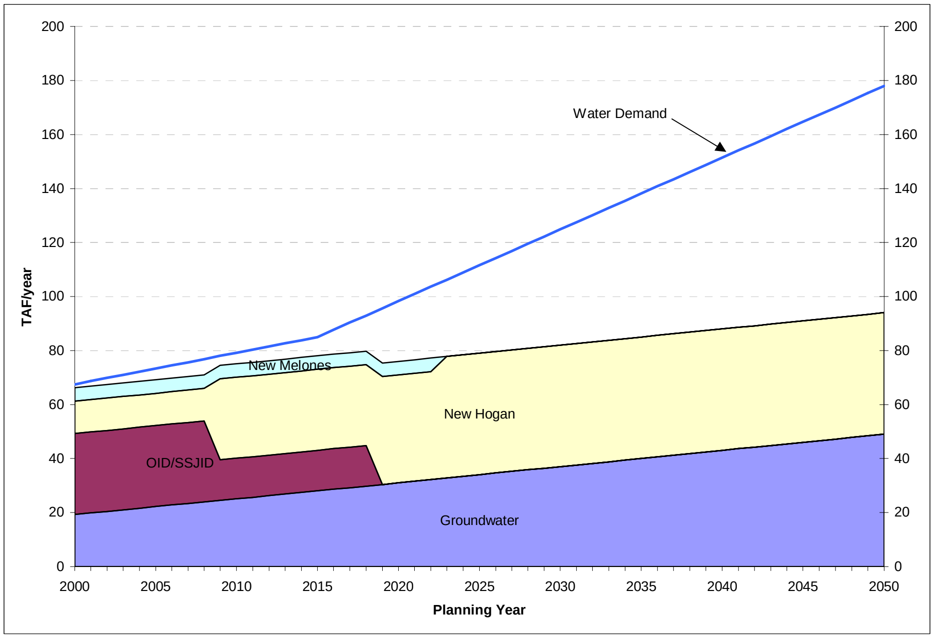


Figure 2-5c
Below Normal Years

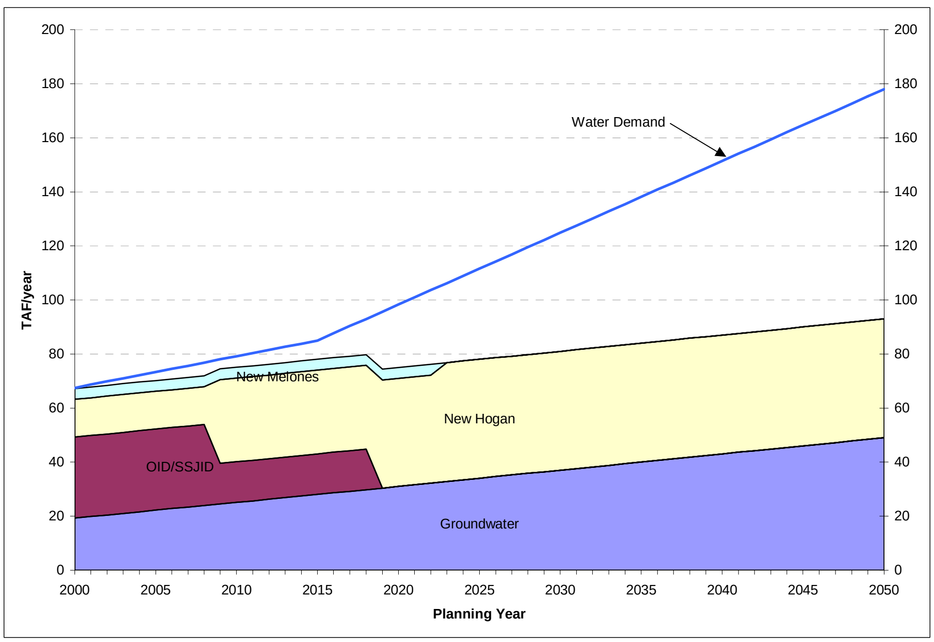


Figure 2-5d
Dry Years

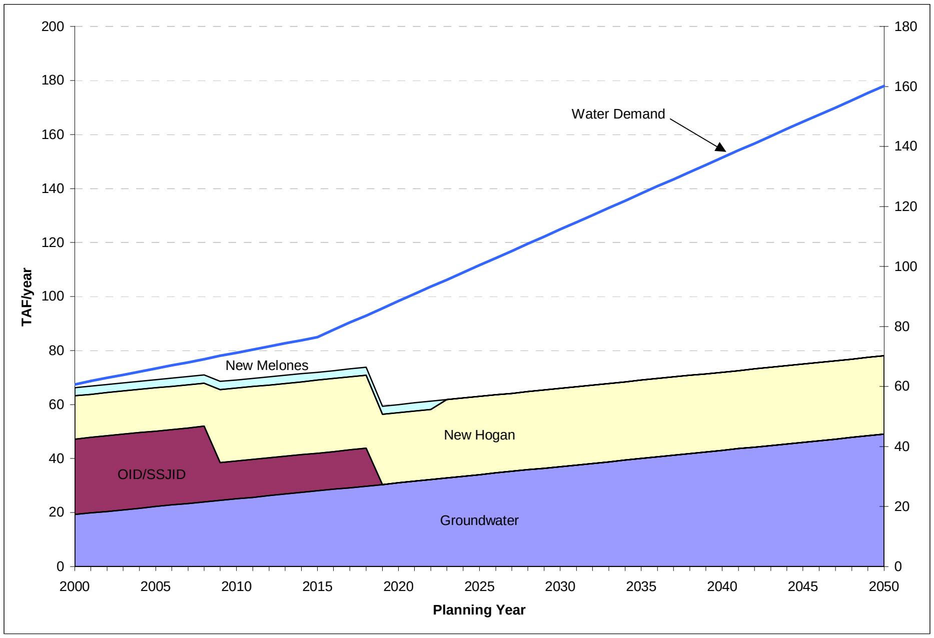
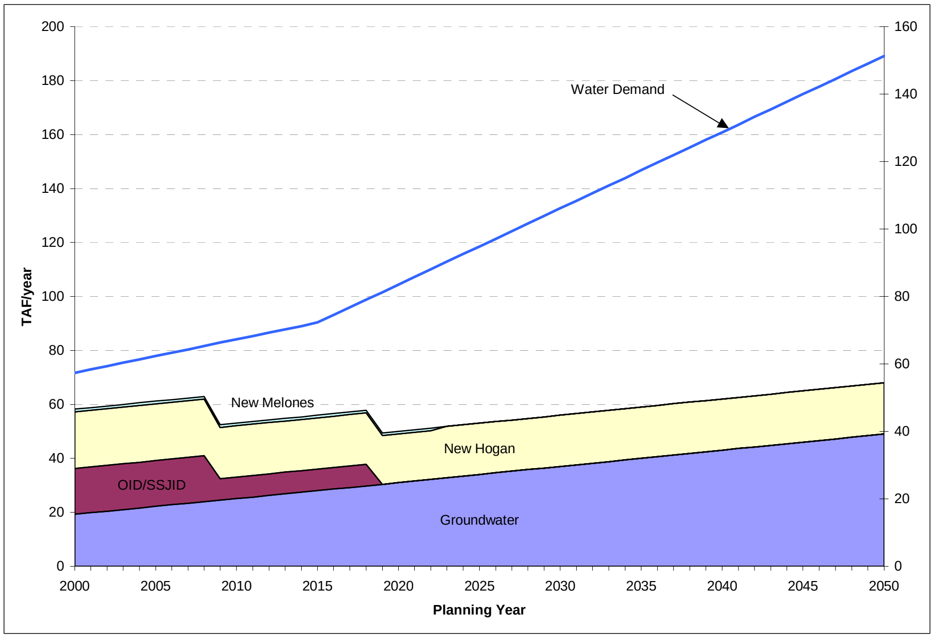


Figure 2-5e
Critical Years



In addition, the joint OID/SSJID contract may not be fully renewed in the future, and the New Hogan water supply would be reduced due to growing water demand in Calaveras County. The critical year supply available from SEWD to the COSMA is projected to be as little as 18,000 AF by 2020 (Table 2-1).

ABILITY OF DWSP TO ACCOMMODATE PLANNED GROWTH

Even without additional growth, the DWSP would be needed to make up for the loss of the OID/SSJID and New Melones contracts currently being delivered by SEWD, and to achieve the "target" yield of the groundwater basin. The loss of these contracts would leave SEWD with only 40,200 AF/year of "firm" surface water from its Reclamation contract for New Hogan water supplies. The DWSP would provide additional water to meet the unmet demand after groundwater, water rationing, and existing SEWD supplies are considered.

2.3 DESCRIPTION OF PROPOSED PROJECT

2.3.1 WATER RIGHTS

The City filed a water rights application for the DWSP with the SWRCB on January 6, 1996. The water rights application was accepted by the SWRCB in October 1997, and publicly noticed in December 1997. The City's water rights application addresses a long-term planning horizon through the year 2050, requesting an ultimate diversion to 125,900 AF/year. The water rights application specifies a Place of Use for the water that is coincident with the City's 1990 General Plan Boundary (Figure 2-1).

The unique location of the COSMA, within the legally-defined Delta and the area of origin, allows the City to take advantage of several statutes benefiting water users within the Delta. The City filed the water rights application to appropriate surplus Delta water and water available under the following sets of statutes:

- California Water Code Section 1215 et seq. (area of origin provisions)
- California Water Code Section 1485 (related to the recapturing of discharged treated wastewater)
- California Water Code Section 11460 et seq. (area of origin provisions)

Each of these rights and the availability of water under these rights to the DWSP are discussed below.

CALIFORNIA WATER CODE SECTION 1215 et seq.

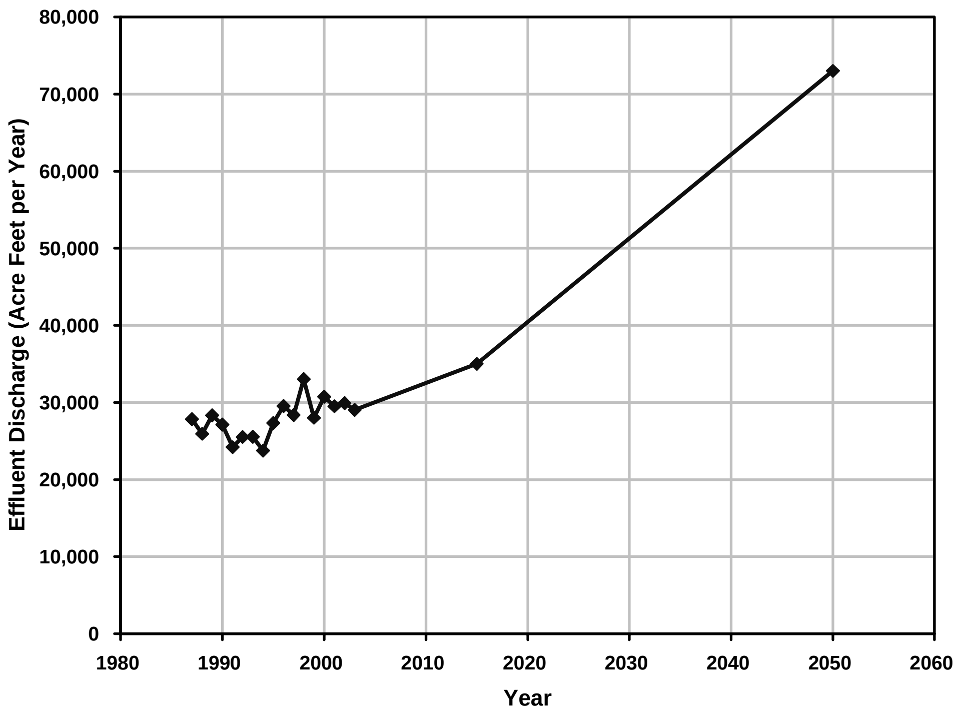
These sections of the Water Code give "protected areas" priority over exported water with priority dates after January 1, 1985, except export water subject to Section 11460, namely exports by the State Water Project (SWP) and the Central Valley Project (CVP). Along with the right to obtain rights with senior priority, water users within protected areas have a right to contract with the exporter to purchase with adequate compensation, water made available by works constructed by the exporter. Section 1215.5 defines the "protected area" or area of origin to include both the San Joaquin River and Delta.

CALIFORNIA WATER CODE SECTION 1485

California Water Code Section 1485 [4] allows any municipality disposing of treated wastewater into the San Joaquin River to seek a water right to divert a like amount of water, less losses, from the river or Delta downstream of the point of the wastewater discharge. The City currently discharges approximately 29,000 AF/year of treated wastewater to the San Joaquin River. The City's discharge is projected to increase to approximately 46,000 AF/year in 2025 and approximately 74,000 AF/year in 2050.

Historical and projected future effluent discharges from the City RWCF are shown in Figure 2-6. The wastewater discharge is expected to stay relatively constant until 2015 as a result of existing

FIGURE 2-6
HISTORICAL AND PROJECTED TREATED EFFLUENT DISCHARGE FROM STOCKTON REGIONAL WASTEWATER CONTROL FACILITY



4 California Water Code Section 1485 states in part, "Any municipality, government agency, or political subdivision operating waste disposal plants producing disposal water meeting the requirements of the appropriate regional board, and disposing of said water in the San Joaquin River may file an application for a permit to appropriate an equal amount of water, less diminution by seepage, evaporation, transpiration or other natural causes between the point of discharge and the point of recovery, downstream from disposal plant and out of the San Joaquin River or the Sacramento-San Joaquin Delta. A permit to appropriate such amount of water may be granted by the board upon such terms and conditions as in the board's judgment are necessary for the protection of the rights of others. Water so appropriated may be sold or utilized for any beneficial purpose. The right to the use of water granted by this section shall not include water flowing in underground streams."

high volume water users improving their water use efficiencies. The estimated future effluent discharge was modified to reduce the expected long-term yield of the Section 1485 water for the DWSP Feasibility Study (Stockton MUD et al., 2003). This assumption differs slightly from the water rights application where the amount of Section 1485 water available in a given year is assumed to be 41 percent of the total municipal use within the water rights application proposed Place of Use.

The amount of water available is reduced by seepage, evaporation, transpiration, and other natural causes between the RWCF and the diversion. The San Joaquin River and associated Delta channels are in balance with the connected groundwater systems; therefore, seepage losses can be estimated at zero. Also, the incremental flow added at the RWCF has no appreciable effect on top width of the river; therefore, evaporation from the river surface is not increased. Similarly, transpiration is not measurably affected by the incremental flow since the top width of the water surface is not increased. Therefore, it is assumed that the volume of water loss between the wastewater treatment plant and any diversion point is negligible.

No reductions of Section 1485 water would occur in dry years as a result of water rationing, because rationing is assumed to affect only the outdoor uses of water that typically do not enter the wastewater system. However, Section 1485 water may be subject to pumping restrictions due to fish protection as described in Chapter 4, Delta Water Resources and Fisheries.

CALIFORNIA WATER CODE SECTION 11460 et seq.

Beyond 2015, the City would divert additional water under both California Water Code Sections 1485 and 11460 et seq. California Water Code Section 11460 et seq. allow a water user within a watershed or other area of origin to appropriate water that otherwise would be exported and receive a priority senior to the rights of the federal CVP and the SWP. Diversion of water from the Delta under the area of origin statute is subject to various regulatory restrictions, including

Term 91 [5] conditions, which prohibit diversion by others at times when the SWP and/or CVP are required to release stored water from their reservoirs in excess of export diversions, project carriage water, and project in-basin deliveries. Under these conditions, the City would be allowed to divert water only at times when Delta outflow is greater than regulatory minimum

[5] Term 91 reads as follows:

"No diversion is authorized by this license when satisfaction of inbasin entitlements requires release of supplemental Project water by the Central Valley Project or the State Water Project.

a. Inbasin entitlements are defined as all rights to divert water from streams tributary to the Sacramento-San Joaquin Delta or the Delta for use within the respective basins of origin or the Legal Delta, unavoidable natural requirements for riparian habitat and conveyance losses, and flows required by the State Water Resources Control Board (SWRCB) for maintenance of water quality and fish and wildlife. Export diversions and Project carriage water are specifically excluded from the definition of inbasin entitlements.

b. Supplemental Project water is defined as water imported to the basin by the projects, and water released from Project storage, which is in excess of export diversions, Project carriage water, and Project inbasin deliveries.

The SWRCB shall notify the licensee of curtailment of diversion under this term after it finds that supplemental Project water has been released or will be released. The SWRCB will advise the licensee of the probability of imminent curtailment of diversion as far in advance as practicable based on anticipated requirements for supplemental Project water provided by the Project operators."

requirements, or when the CVP and/or SWP are exporting water that has not previously been stored in CVP-SWP reservoirs or imported to the basin by the CVP-SWP.

Figure 2-7 shows the estimated average monthly volume of Section 11460 water available under Term 91 based on a 73-year record (1922–1994) calculated using the CALSIM Water Resources Simulation Model, developed by the California Department of Water Resources (DWR). As shown in Figure 2-7, the majority of available water occurs during December through May. Figure 2-8 illustrates the availability of Section 11460 water under Term 91 over the 73 years of historical hydrology used in the CALSIM model runs.. Although the available water always exceeds 800 TAF/year, for six years (8 percent), there is no available water from June through September.

2.3.2 PROJECT OPERATIONS

The DWSP would implement a conjunctive use program that would integrate surface water and groundwater management to maximize efficient water management. The DWSP conjunctive use program would rely on groundwater in dry years to augment limited surface water supplies. Initially as surface water from the DWSP becomes available, the groundwater would be replenished by reducing groundwater pumping and allowing natural recharge to take place as shown in Figure 2-9. Initially, DWSP diversions would exceed the unmet demand (Figure 2-4) to allow recovery of the groundwater basin. DWSP diversions would have a higher priority than groundwater pumping, and be limited by the DWSP WTP capacity or by the demand. In later stages of the DWSP, direct recharge using injection wells in wet years would be implemented to maintain groundwater elevations and volumes. Injecting surface water into the basin would involve retrofitting existing wells or constructing injection/extraction wells for this purpose.

FIGURE 2-7
AVERAGE MONTHLY AVAILABILITY OF SECTION 11460 WATER UNDER TERM 91 CONDITIONS

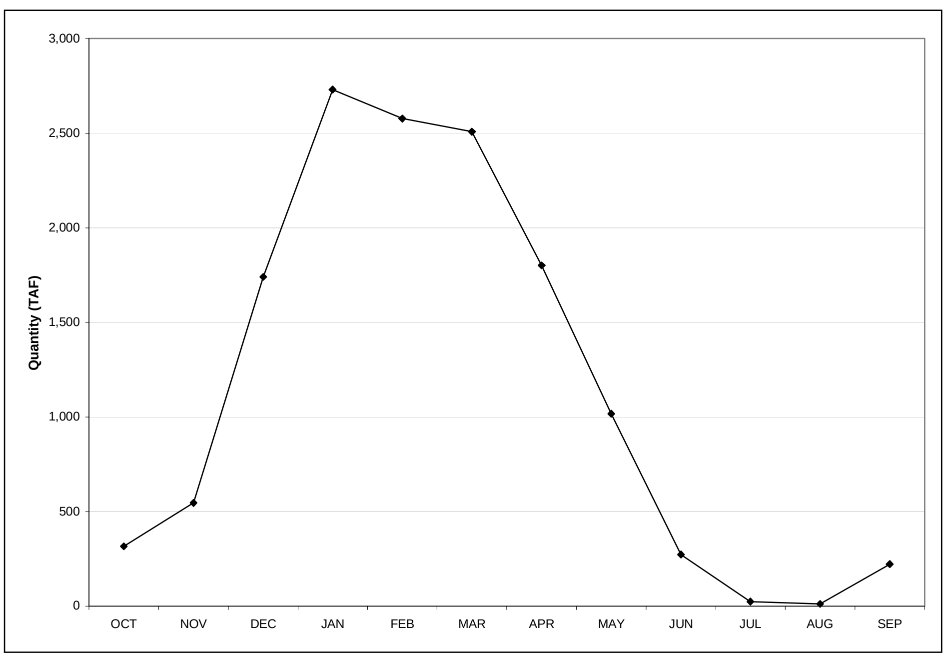


FIGURE 2-8
AVAILABILITY OF SECTION 11460 WATER OVER 73 -YEAR PERIOD UNDER TERM 91 CONDITIONS

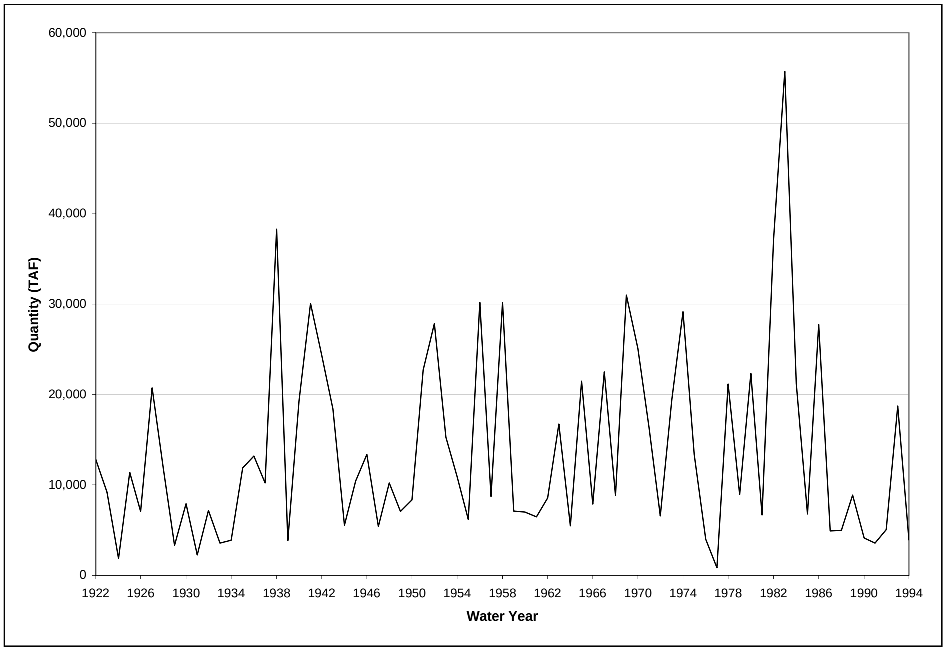
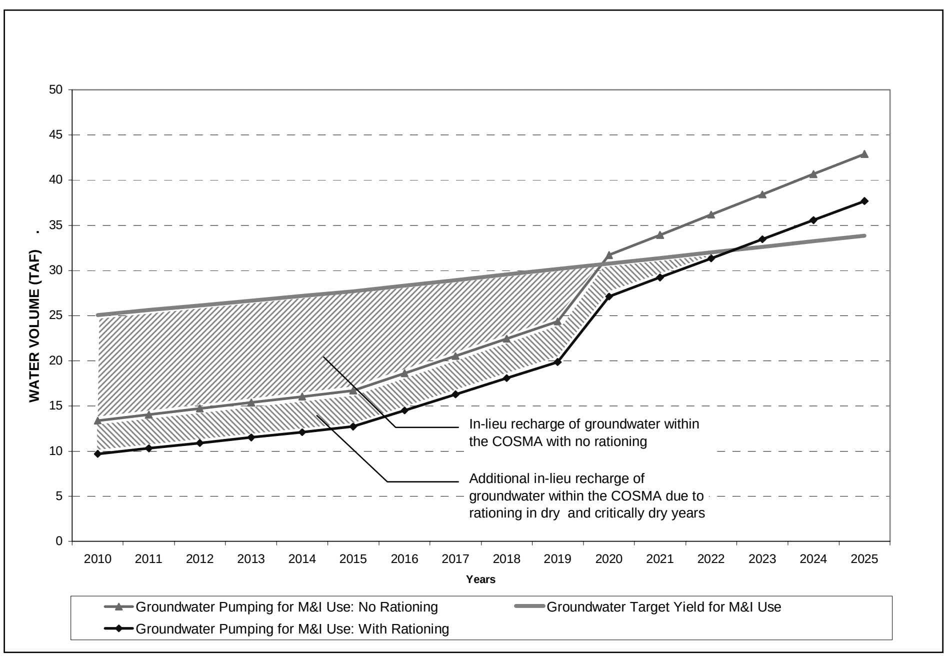


FIGURE 2-9
AVERAGE GROUNDWATER PUMPING WITHIN THE COSMA - 30-MGD DWSP



2.4 PROPOSED FACILITIES

The DWSP would consist of installing a new water intake facility located on the San Joaquin River, new pipelines to convey the raw water to a new WTP located in the area north of the COSMA, and new treated water pipelines to deliver water to the City's existing water distribution system (Figure 2-2). The initial capacity of the DWSP would be 30 mgd, with staged incremental expansions to an ultimate capacity of 160 mgd. The intake facility and pump station would be designed to facilitate these expansions and to avoid extensive future construction in the river and sloughs.

INTAKE STRUCTURE AND PUMP STATION FACILITIES

The proposed intake site would be located on the southwest tip of Empire Tract adjacent to the San Joaquin River. The general area designated for the intake is located on a bend of the river, which creates two shorelines (south and west banks of Empire Tract) as potential locations for the intake and pump station (Figure 2-10). These locations are within 500 feet of one another. These locations differ as to river bottom topography and hydrology.

INTAKE LOCATION

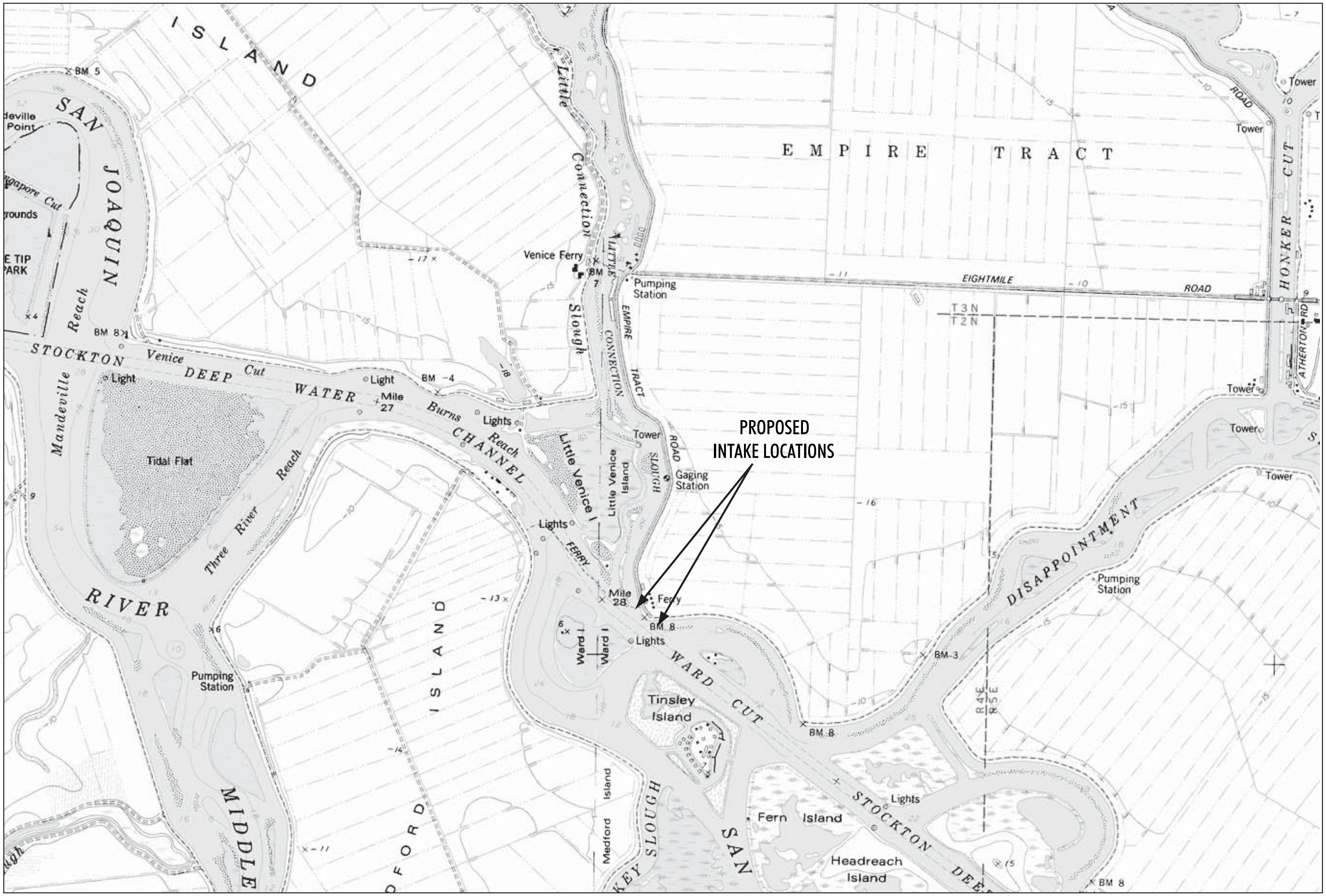
The river bottom profile for the south bank location indicates a rapid drop-off to a contour of -15 feet within approximately 60 feet of the existing levee, and depths of up to -30 feet are found about 350 feet off-shore (Figures 2-11a and 2-11b). The -30 foot contour is the approximate location of the beginning of the Stockton Deep Water Ship Channel.

The change in ground surface at the proposed west bank location is shown in Figures 2-12a and 2-12b. The inland side of the location falls from approximately 7.5 feet at the levee to approximately -2 feet. On the San Joaquin River side of the site, the ground surface drops vertically from the levee road 10 feet in the first 50 feet and at approximately 265 feet from the levee road, the river bottom elevation is -37 feet, which is the beginning of the Stockton Deep Water Ship Channel.

Flow data characteristics were obtained for both locations from two DWR gaging stations (RSANo43 and RSANo46), located near Empire Tract.

	South Bank	West Bank
Minimum flow	0.04 cfs (0.00000215 fps)*	0.01 cfs (0.0000016 fps)*
Average flow	15,010 cfs (0.81 fps)	1,862 cfs (0.30 fps)
Maximum flow	29,120 cfs (1.57 fps)	5,108 cfs (0.83 fps)

* The Sacramento-San Joaquin River Delta is influenced by tidal action and reverses flow depending on time of day.



SOURCE: USGS 7.5 Minute Quadrangles (Bouldin Island and Terminous); and Environmental Science Associates, 2003

Figure 2-10
Intake Site Location

The two locations are about 500 feet apart. However, the south bank location is farther from the Stockton Deep Water Ship Channel than the west bank locations (350 feet vs. 265 feet). In addition, flows are greater at the south bank location, which would assist in maintaining the desired sweeping velocity of 0.4 fps across the fish screens. Flows in the San Joaquin River in this area tend to be sluggish. Therefore, if the sweeping velocity can not be met, the City will seek a variance from the NOAA Fisheries, USFWS, and CDFG.

INTAKE STRUCTURE

Two intake configurations are currently being considered at each location: (1) an In-River Intake and Pump Station (Figures 2-11a and 2-12a); and (2) an In-Bank Intake with Pump Station facility (Figures 2-11b and 2-12b) both using flat plate screens. These figures depict the ultimate 160-mgd capacity of the intake structure. Figures 2-13 and 2-14 show photographic examples for illustration purposes only of an in-river configuration and an in-bank configuration, respectively. Each of these configurations is described in the following sections.

In-River Intake and Pump Station Facility

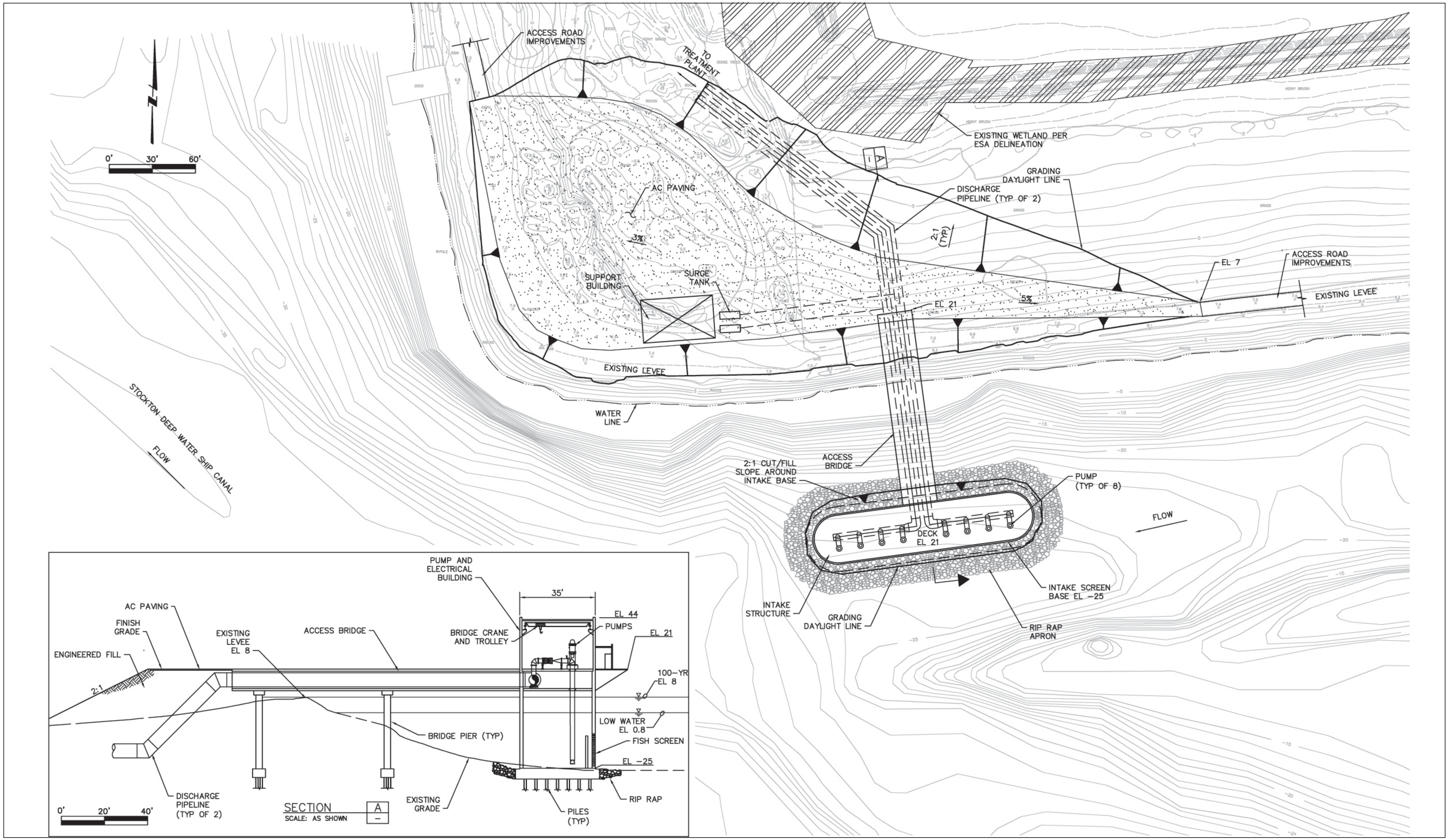
For this configuration, the fish screens, suction well, and pumping plant would consist of a cast-in-place concrete structure located offshore in the San Joaquin River. The intake wetwell would extend approximately 35 feet above the pile supported four-foot concrete base slab. The structure would be connected to the levee by an access bridge, allowing maintenance access for the fish screens and pumping equipment and support for the piping conveying raw water over the levee. The removable fish screens would be installed in slots in the vertical walls of the structure at suitable elevations to meet resource agency criteria. Sedimentation piping headers and flow control louvers would be located behind the screens.

Pumps and electrical equipment would be located on the operating floor level at an approximate elevation of 21 feet msl. This would provide clearance between the bottom of the access bridge and the 100-year flood stage. The operating floor would be enclosed in a building to provide security, protect equipment, and support an overhead bridge for maintenance purposes. The overall height of the building would be approximately 23 feet with a roof elevation of 44 feet msl to provide clearance for equipment removal; the structure would extend 36 feet above the 100-year flood water level. The intake height is the based on Reclamation Board requirements as stipulated in the California Code of Regulations, Title 23, Section 128, which states that the bottom member (soffit) of a proposed bridge must be at least three feet above the design floodplain.

In-Bank Intake and Pump Station Facility

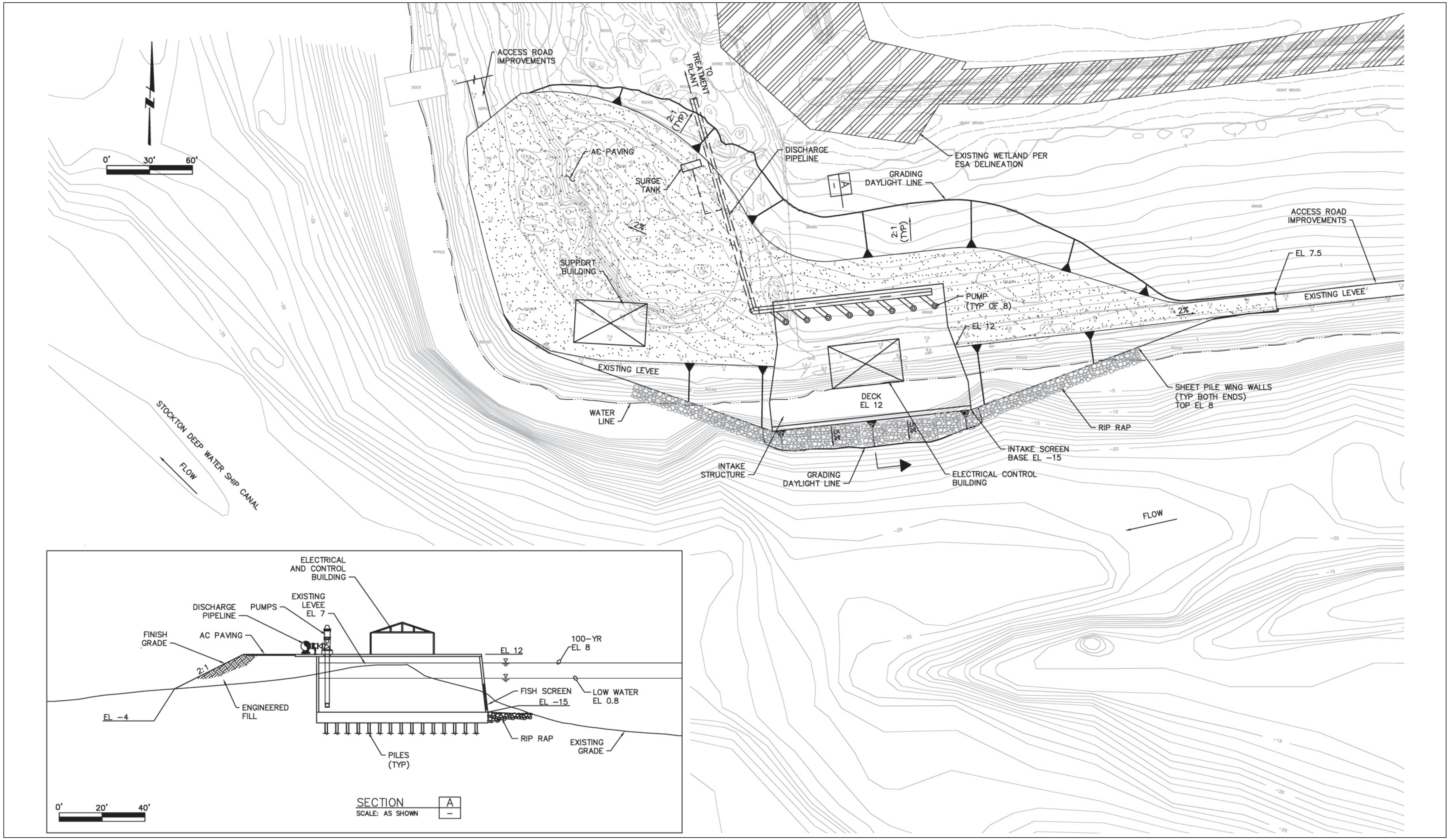
For this configuration, the fish screens and intake channel would be built into the existing levee. The intake would consist of a cast-in-place concrete structure located on the shore of the San Joaquin River. The removable fish screens would be installed in slots at the opening of the structure at suitable elevations to meet resource agency fish protection criteria. Mechanical brushes or other cleaning device would be incorporated into the design of the fish screens.

Pumps, valves, and manifold piping would be constructed on the north side of the structure at grade for ease of access. Electrical equipment would be located adjacent to the pumps housed in a building constructed on the operating deck of the intake. The operating deck



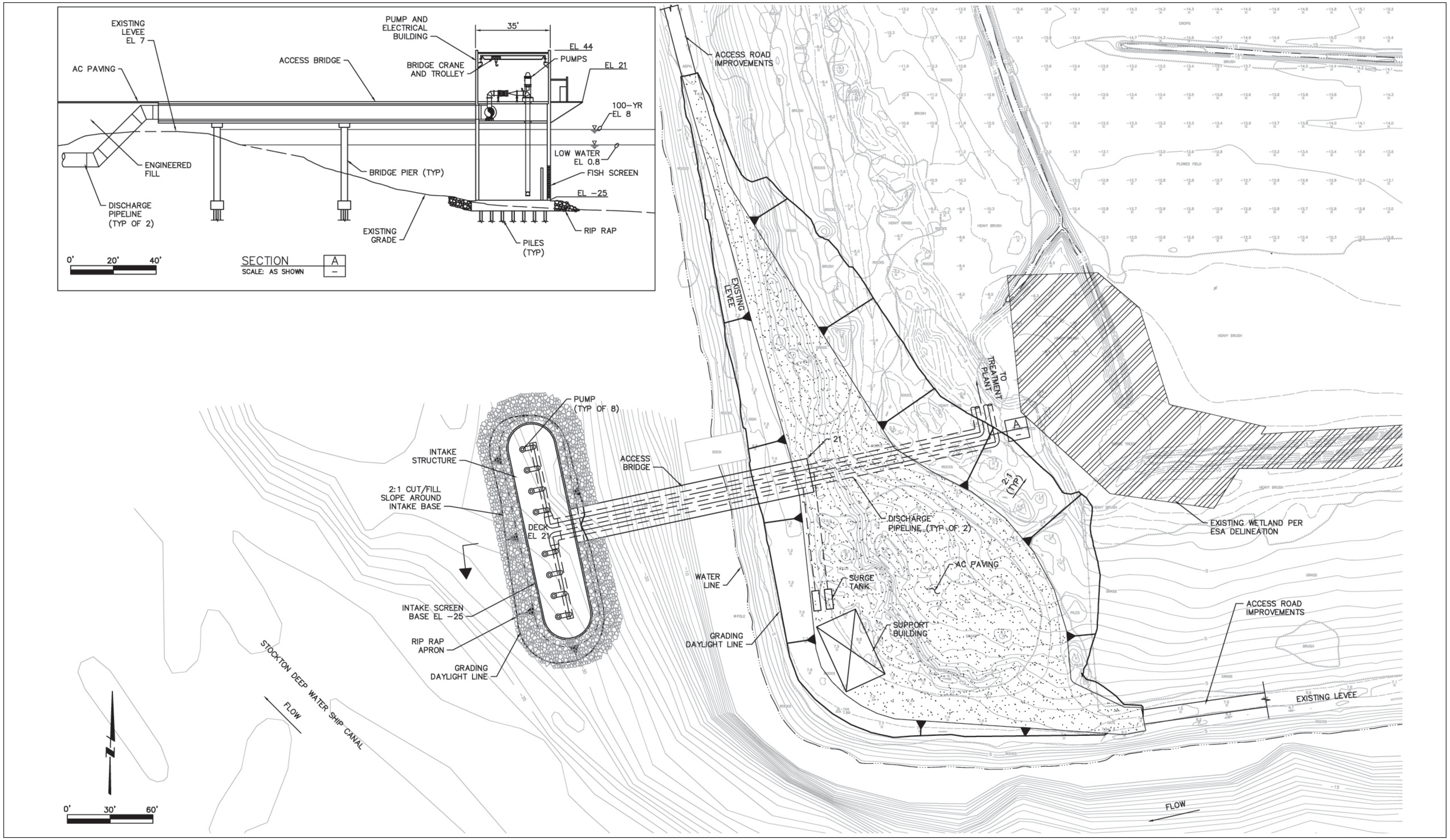
SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-11a
In-River Intake Alternative 1A



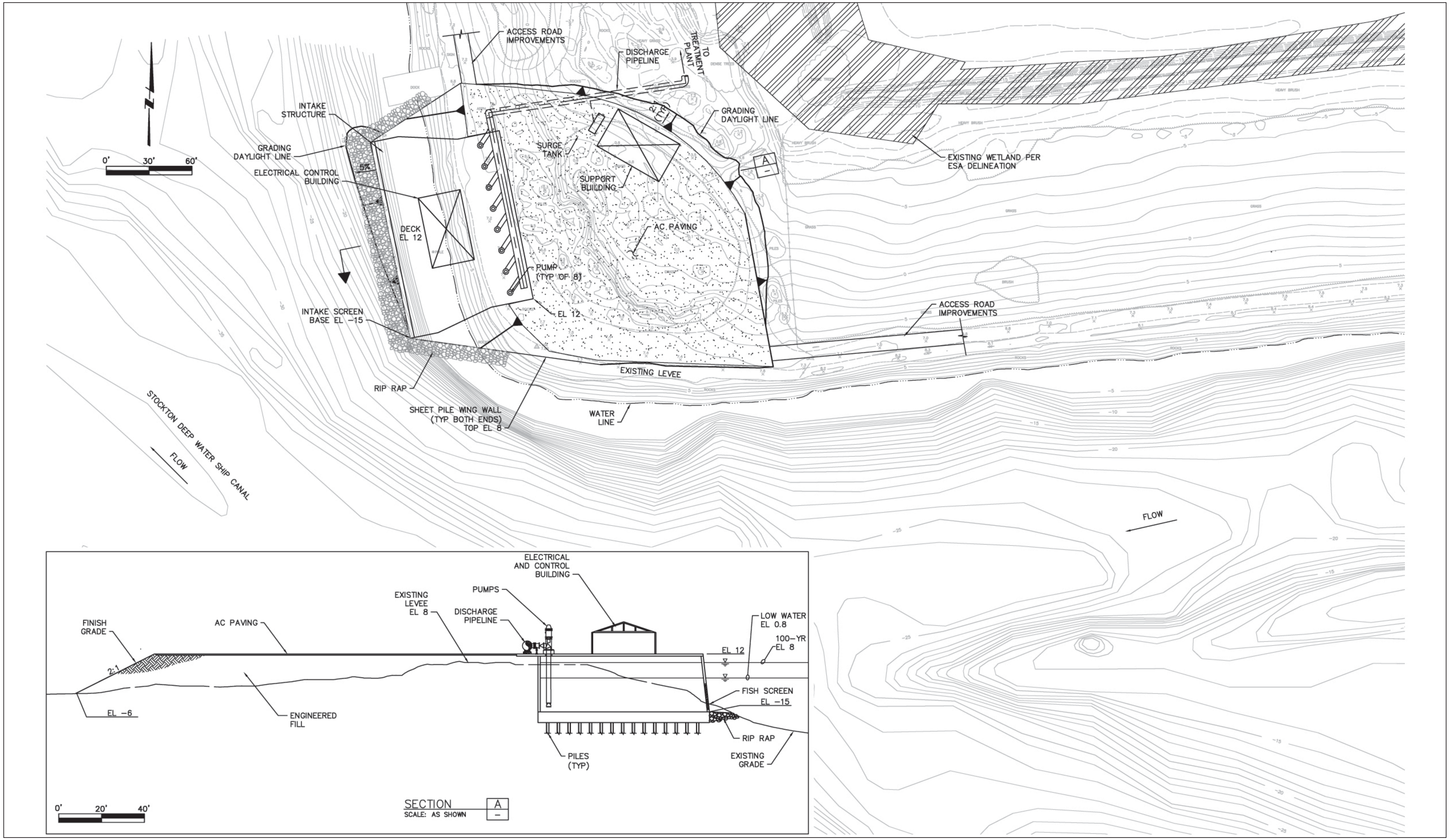
SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-11b
In-Bank Intake Alternative 2A



SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-12a
In-River Intake Alternative 1B



SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-12b
In-Bank Intake Alternative 2B

Photographs taken at the E.A. Fairbairn Water Treatment Plant in Sacramento, California
(Figure is for illustration purposes only. Intake is 121 feet long, 30 feet wide, and 80 feet tall.)

SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-13
Photographic Example of an In-River Intake

Photographs taken at the Old River Facility Pumping Plant, Los Vaqueros, California
(Figure is for illustration purposes only.)

SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-14
Photographic Example of an In-Bank Intake

elevation would be approximately 12 feet msl, with the electrical building height of approximately 23 feet. The roof elevation of 35 feet msl would provide clearance for equipment removal; the structure would extend 27 feet above the 100-year flood water level.

Fish Screens

Vertical screens on the In-River Intake Configuration would be up to 20 feet in height. The footprint would be limited to a structure with dimensions of approximately 135 feet x 35 feet with screens on only one side. If depth or approach is further restricted, additional screens could be installed on the opposite side of the structure with only a small addition to the structure width. The removable fish screens would be installed in slots in the vertical walls of the structure at suitable elevations to meet resource agency criteria. Water wash pipe grids and flow control louvers, if needed, would be installed behind the screens.

For the In-Bank Intake Configuration the fish screens may be slightly angled from vertical to better contour with the slope of the existing levee. The screen height would be 15 feet with a nominal structure length of 120 feet.

For either intake configuration, the fish screens would be designed to meet the fish screen criteria established by the National Marine Fisheries Service (NMFS or NOAA Fisheries, 1997) and the California Department of Fish and Game (CDFG, 2000). The screens would have the following characteristics.

- **Screen Orientation.** The screens will be oriented so that the screen face is parallel to river flow; upstream and downstream transitions will minimize eddies.

- **Approach Velocity.** A uniform approach velocity of less than 0.2 feet per second (fps) as well as an adjustment for flow patterns will be provided across the face of the screen. For an ultimate capacity of 160 mgd, a minimum of 1,240 square feet (ft^2) of screen area will be provided, excluding the area for structural supports.

- **Screen Cleaning.** The entire fish screen will be capable of completing an automatic cleaning cycle once every five minutes. Screen cleaning will be accomplished using a water wash system or a traveling brush system.

- **Sweeping Velocity.** The sweeping velocity design criteria for river intakes is at least twice the approach velocity (i.e., 0.4 fps or higher). Due to tidal influence at the proposed intake site, this cannot be achieved continuously. With a river channel cross-sectional flow area of approximately 18,000 ft^2, flow rates must exceed 7,200 cfs to meet the sweeping velocity criteria of 0.4 fps. This occurs about 80 to 85 percent of the time at the intake site. The City plans to work with NOAA Fisheries, U.S. Fish and Wildlife Service (USFWS), and CDFG to develop site-specific requirements for the DWSP.

- **Screen Openings.** The opening size of the screens will not exceed 1.75 millimeter (mm); the minimum open area will be 27 percent.

- **Screen Materials.** The screens will be constructed of stainless steel or copper-nickel alloy using wedge wire.

Pumping and Electrical Requirements

Pumps would lift water from the intake and deliver it to the WTP. The total required lift to the WTP would be approximately 51 feet for delivery of 30 mgd through an initial 54-inch diameter pipe.

For the initial pump station capacity of 30 mgd, the total connected electrical load for the intake facility would be approximately 850 kilovolt-amperes (kVA). Ultimate electrical capacity for the intake pump station and interim phasing would depend on the timing for construction of the parallel 72-inch diameter raw water pipeline. Upgrade to the existing electrical infrastructure would be required to efficiently meet the initial and ultimate needs of the facility. The ultimate electrical load could reach as high as 7,000 kVA.

Existing high voltage electrical transmission lines are located west and parallel to I-5. Electrical service requirements at the WTP would be even higher than at the intake pumping station, so developing primary service voltage for the WTP would provide an opportunity to coordinate service to the intake pumping station. Electrical service for the intake pump station would be brought to a new substation near the intake site, from the existing substation located at Eight Mile Road and I-5. Overhead poles presently are located in the road right-of-way from the northwest corner of I-5 and Eight Mile Road to the intake site.

WATER PIPELINES

RAW WATER PIPELINES

The approximately 67,000-foot (12.7-mile) raw water pipelines connecting the intake facility and WTP would be installed beneath or north of Eight Mile Road with a short south segment paralleling Empire Tract levee along Little Connection Slough (Figure 2-2). The pipeline alignment would be located 250 feet east of the centerline of the levee. (Reclamation District 2029 owns the first 150 feet extending landward from the centerline of the levee and has jurisdiction over an additional 100 feet landward). This distance from the levee would provide sufficient space for future upgrade of the levee.

The pipeline alignment would use existing public right-of-ways where available. Because the project capacity would be constructed in stages, two parallel pipelines would be built along the selected alignment. A 54-inch diameter pipeline would be installed initially and would provide for the initial 30 mgd WTP and future expansion up to 60 mgd. A future parallel 72-inch diameter pipeline would be added when additional capacities up to 160 mgd are needed. Staggered construction of two pipelines would reduce the initial cost of conveyance facilities, maintain sufficient velocity in the piping to avoid deposition/re-suspension impacts on the WTP, and ultimately provide redundancy for maintenance and emergency services.

In order to properly operate and maintain the raw water pipelines, appurtenant facilities would be required. Appurtenant facilities would include blowoffs, air and vacuum/air release valves, intertie stations, and access manways.

- **Blowoffs.** Blowoffs are below-ground facilities, which would be included to enable dewatering of the pipelines. Blowoffs would be located at low elevations in the pipelines and on the upstream side of isolation valves. A blowoff consists of a bottom outlet tee (sized for the pipe volume to be drained) with a shutoff valve that can be operated to allow removal of water from the system.

- **Air and Vacuum/Air-Release Valves.** Air and vacuum values would be used to admit air into the pipe to prevent formation of a vacuum that might result from valve operations, rapid draining such as a line break, column separation, etc. Without air and vacuum valves, a vacuum could cause the pipe to collapse from atmospheric pressure. Air release valves would be required at high points along the pipelines to release any air build-up in the pipelines due to variations in flow velocity caused by changing pipeline diameters and slopes, and pipeline elevations.

- **Intertie Stations.** Intertie stations would connect the two pipelines (54-inch and 72-inch) periodically along the alignment and allow for isolation of a portion of either pipeline for maintenance or repair without taking the entire pipeline system out of service. The stations would be placed at a maximum spacing of 2.5 miles. Because the raw water pipelines would be constructed in two stages, the intertie stations for the initial 54-inch pipeline would be limited to two isolation valves, a tee, and blind-flange oriented in the direction of the future parallel pipeline.

- **Access manways.** Access manways would allow access into the pipelines for inspection, maintenance, and repair. Access points would consist of a flanged outlet oriented vertically; removal of the flange would be required for access. Typically manways would be located adjacent to or combined with other appurtenances and would be provided at approximately 2,000-foot intervals.

TREATED WATER PIPELINES

At the initial plant capacity of 30 mgd, a 54-inch diameter pipeline would connect the process area of the WTP to the existing distribution system (Figure 2-15). Approximately 38,730 feet (7.3 miles) of piping would be required. The treated water pipeline would parallel the east side of Lower Sacramento Road south to the south side of Eight Mile Road. A minimum 10-foot horizontal separation would be provided between the raw water and treated water pipelines to meet DHS standards and facilitate construction.

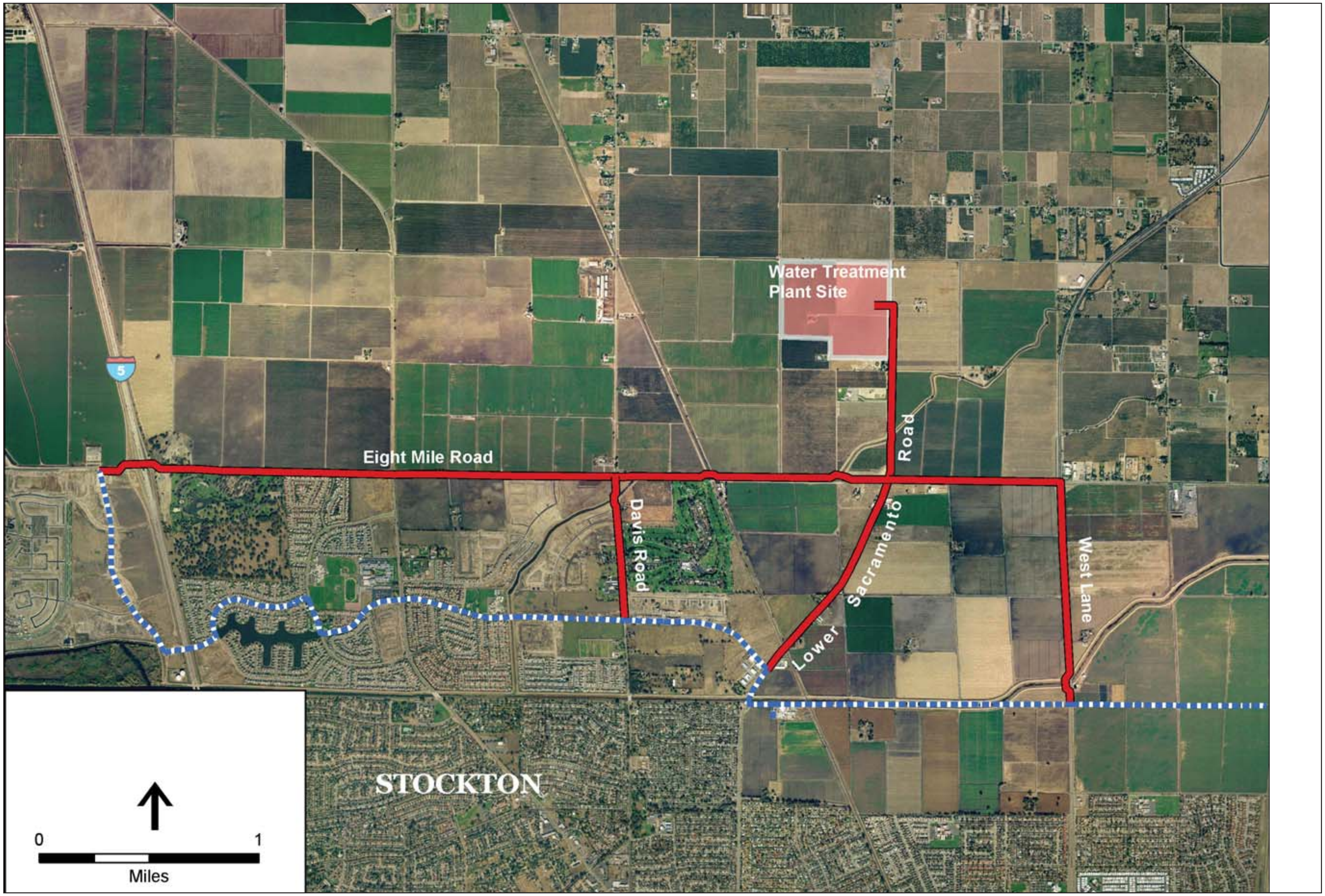
From the intersection of Lower Sacramento and Eight Mile Roads, the pipeline would connect with the existing distribution as follows:

- From the intersection of Lower Sacramento and Eight Mile Roads, south along Lower Sacramento Road to Wakefield Road.

- From the intersection of Lower Sacramento and Eight Mile Roads, east along Eight Mile Road to West Lane, then south on West Lane to Wakefield Road.

- From the intersection of Lower Sacramento and Eight Mile Roads, west along Eight Mile Road to Davis Road, then south on Davis Road to about Whistler Way.

- From the intersection of Eight Mile and Davis Roads, west along Eight Mile Road to Trinity Parkway.



SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-15
Treated Water Transmission Pipeline

WATER TREATMENT PLANT

The WTP would be located approximately three miles east of I-5 and 0.5 mile north of Eight Mile Road along Lower Sacramento Road (Figure 2-2). The facility would occupy approximately 56 acres along the western side of a 126-acre parcel. An eight-foot tall perimeter fence inside a 100-foot set back would surround the WTP site. Within this setback, trees would be planted along the perimeter to partially screen the WTP facilities from public view. Raw water would enter the plant via a 54-inch diameter pipeline. A second parallel 72-inch diameter pipeline would be constructed in the future, as the plant capacity is expanded beyond 60 mgd to its ultimate capacity of 160 mgd. The WTP would likely be either (1) a conventional treatment plant using ozone, deep bed granular activated carbon, or (2) a membrane treatment plant with conventional pre-treatment using powdered activated carbon.

All of the facilities shared by both conventional and membrane filtration treatment would be constructed of concrete and painted. The grit basins, flow split, flocculation and sedimentation basins, filters, equalization basins, and backwash clarification would be open-water areas. Clearwells (potable water storage tanks) and ozone contact basins would be below ground. The administration/operations building, maintenance building, membrane filtration building, ultra-violet (UV) treatment building, chemical building, electrical building, and treated water pump station would be enclosed structures, constructed of concrete masonry units (CMU) or steel. CMU buildings would be faced with materials such as stucco or split-face block. Steel structures would be painted to blend with the existing environment.

The maximum power requirement for the 30 mgd WTP would be approximately 2,630 kVA for conventional treatment and 2,700 kVA for membrane treatment. Power for the WTP would be available from existing Pacific Gas & Electric (PG&E) 12 kilovolts (kV) power lines. One feeder would come from the Mettler Substation in the Lower Sacramento Road/Armstrong Road area. A second feeder would be routed from the Hammer Lane Substation, which would need to be extended approximately 0.5 mile to reach the WTP. The primary backup power supply would be the installation of two separate feeds into two transformers at the WTP site to feed 4.16 kV into the power distribution substation. An alternative backup power supply option would be the use of diesel generators.

Because there is no public sewer in the vicinity of the WTP site, domestic waste from the operations and administration building would be disposed of using on-site treatment methods such as a septic tank and leach field.

CONVENTIONAL TREATMENT

Conventional treatment is widely used, is reliable for treating water with seasonal water quality variability, and has a long hydraulic detention time that allows plant performance to be less sensitive to abrupt hydraulic or raw water quality changes. A conceptual site plan for a conventional WTP is shown on Figure 2-16. Conventional treatment components would include grit basins, flash mix (coagulation), flocculation/sedimentation basins, ozone treatment, deep bed granular activated carbon gravity filtration, UV treatment, and clearwell storage. This figure indicates the facilities that would be constructed for the 30-mgd WTP and shows the space reserved for additional future facilities.

Grit Basin

The purpose of the two grit basins would be to remove grit (e.g., silt and sand), protect mechanical equipment, and prevent the accumulation of grit in the flow split, flash mix, and pretreatment processes. The grit basins would be simple sedimentation basins that remove solids via gravity settling. Multiple basins would allow for draining, cleaning, or repair while at the same time maintaining operations. The basins would be rectangular, with similar configurations as the horizontal-flow sedimentation basins for improved flow characteristics.

Flash Mix

Flash mixing would introduce and disperse the primary coagulant chemical into the raw water quickly and evenly. A pumped diffusion injection mixing system, which is a hydraulic method for flash mixing, would be used. The specific coagulant will be determined in preliminary design, for the purposes of this EIR, aluminum sulfate (alum) is the assumed coagulant.

Flocculation and Sedimentation Basins

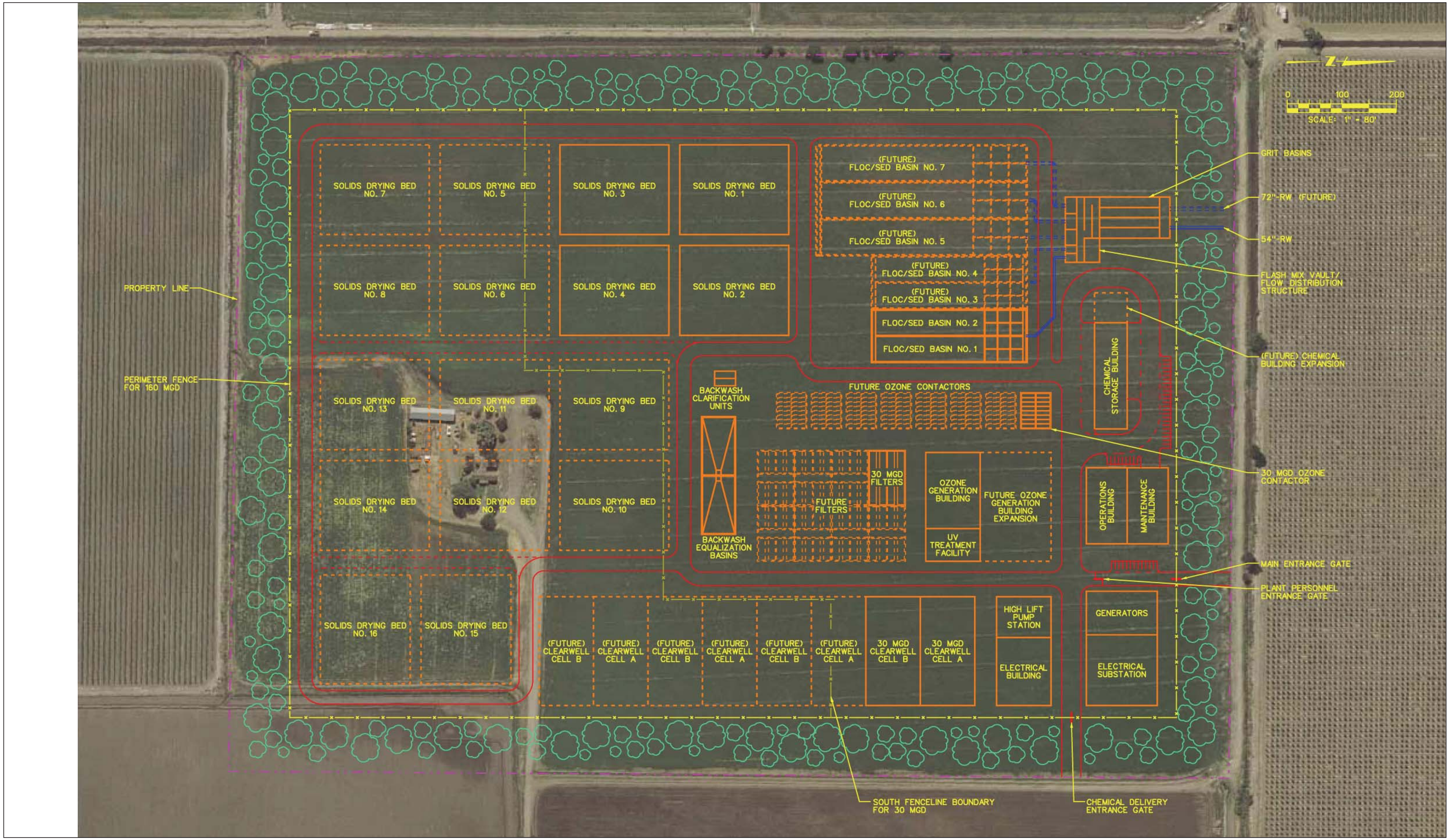
The purpose of two flocculation basins would be to induce contact between the coagulated particles formed in the flash mix process by providing agitation. The two sedimentation basins would remove suspended particles heavier than water by gravity settling. The sedimentation basins would be horizontal-flow basins with plate settlers, because this design provides the most flexibility for highly variable source water quality. Sludge collection would be collected with a chain and flight with cross collection.

Ozone Contact Basins

Ozone contact basins would be used between the sedimentation basins and the filters. The addition of ozone would be used to provide a positive inactivation of chlorine resistant microbial contaminants and achieve regulatory disinfection compliance. The basins would be conventional multi-cells, cast-in-place concrete for use with fine bubble diffusers. Initially two basins will be constructed for the 30-mgd WTP. Additional cells would be constructed as required to support future water demand.

Gravity Filtration

The purpose of filtration would be to remove suspended and colloidal materials from the water. For conventional treatment, deep bed granular activated carbon gravity filters would be used. The filtering system for the 30-mgd WTP would consist of four dual media filters, each filter consisting of two bays. The filters would be equipped with a backwash system and piping to allow for filter-to-waste after backwashing.



SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-16
Conceptual Site Plan for Conventional Water Treatment Plant

Ultraviolet Treatment

To avoid disinfection by-product (DBP) formation, the conventional WTP would include a UV treatment system. Chlorination would occur after UV treatment.

Clearwell Storage

The WTP would have two treated water clearwells for storage. This would allow Operations and Maintenance staff to isolate one clearwell for maintenance without losing the ability to pump to Stockton MUD's treated water distribution system. The volume of the clearwells would be set at 10 percent of the WTP capacity, or 2.4 hours production at average day demand flows (three million gallons). This volume would provide operational flexibility; however, it does not include provisions for fire or emergency storage.

Because the conventional filtration alternative is followed by ozone and UV, disinfection/inactivation of pathogens (e.g., *Cryptosporidium*, *Giardia*, and viruses) would be achieved without the need for additional chlorine contact.

Treated Water Pump Station

The treated water pump station would convey water from the clearwell to the Stockton MUD's treated water distribution system. Conceptual sizing of the pump station would include three vertical turbine pumps configured with two duty and one standby. The treated water pump station total design flow would be 30 mgd with a design total dynamic head of 160 feet. The total connected horsepower, including the backup pump, would be approximately 2,000 horsepower. One switchgear and control building would be built for the pump station.

Operations and Administration Building

The Operations and Administration Building would include four areas: (1) administrative, (2) operational management, (3) laboratory, and (4) the mechanical/workshop. The administrative area would consist of a reception area, storage room for records and office supplies, restrooms, a conference room, and offices for plant managers. The operational management area (control room and lunchroom) would serve as an interface between staff and the process operations of the WTP. The water quality area would consist of a general chemistry, instrumentation, and bacteriology laboratories and a management office. The mechanical/workshop area would house the building's mechanical equipment and provide adequate working space for computer or electronic repair.

Chemical Building

The Chemical Building would house all metering pumps and chemicals that require special temperature control. In addition, the building would have a covered storage for chemicals that will consist of concrete base slab construction with containment walls dividing chemicals from mixing in the event of a spill (acids would be separates from bases, where applicable).

Electrical Building

Power would enter the WTP site and go directly to transformers to reduce voltage from 12 to 4.16 kV. The secondary of the transformers would then go to two main breakers at the WTP power distribution substation.

MEMBRANE FILTRATION TREATMENT

Membrane filtration treatment shares several of the same processes used for conventional treatment including: grit basins, flash mix (coagulation), flocculation/sedimentation basins, and clearwell storage as described above. In place of ozone treatment, gravity filtration, and UV treatment; membrane treatment would use microfiltration or ultrafiltration membranes.
A conceptual site plan for a membrane filtration WTP is shown on Figure 2-17. This figure indicates the facilities that would be constructed initially and shows the space reserved for additional facilities that would be added in the future.

Membranes would serve as the primary filtration in the production of finished water quality that would meet or exceed current state and national standards for drinking water. Either immersed or submerged membrane systems (microfiltration or ultrafiltration) similar to those manufactured by Zenon or US Filter would be used. This alternative would also utilize powdered activated carbon for control of taste and odor from organic compounds such as pesticides, pharmaceutical products, and other natural compounds. Membrane filtration would provide a positive barrier to bacteria and organisms such as *Giardia* and *Cryptosporidium*.

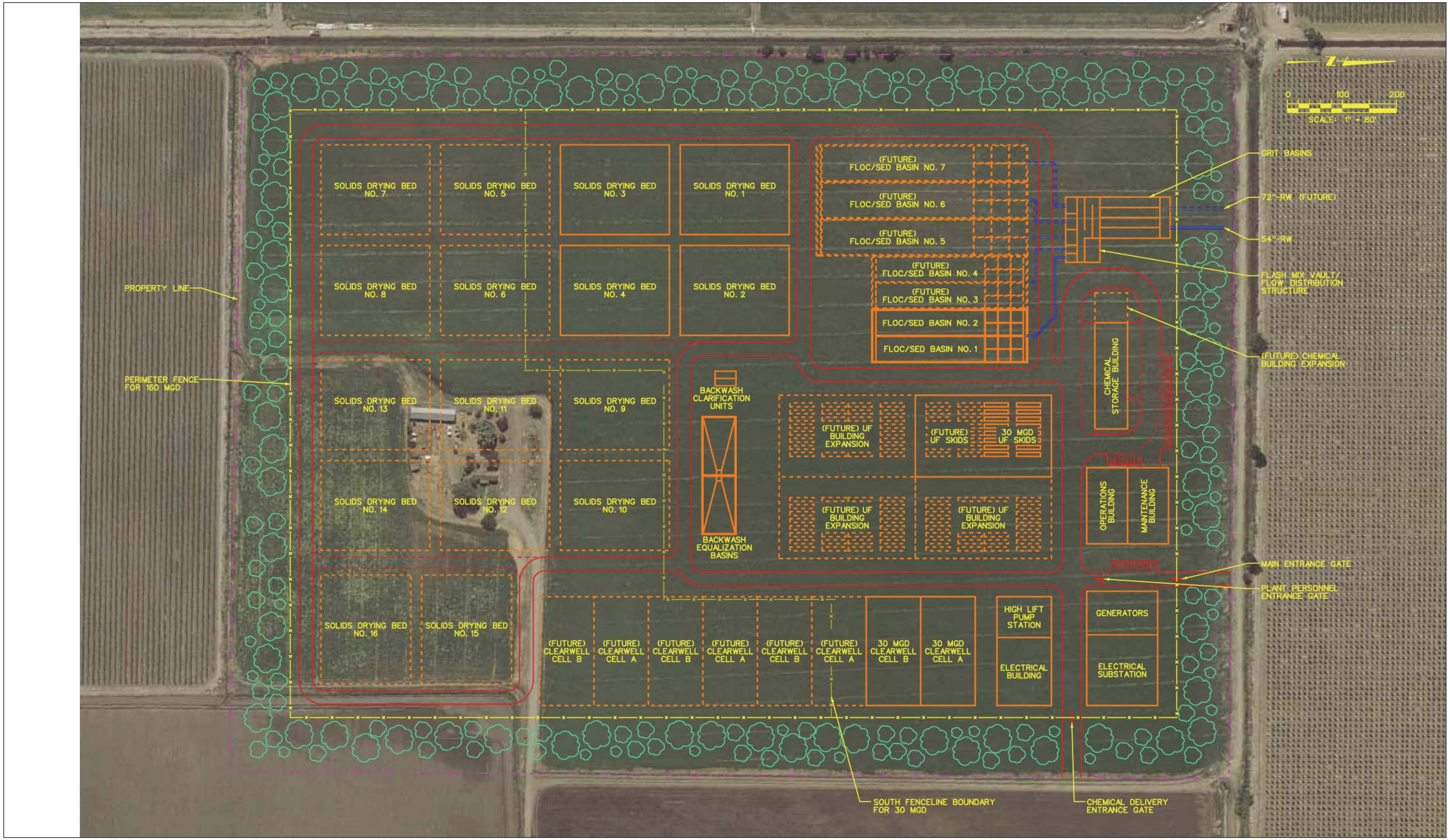
Five equally sized treatment trains would be used to produce 30 mgd. A sixth cell would be installed to provide firm capacity when one membrane cell would be out-of-service for cleaning and backwashing. The membrane system would be housed within a building that is expandable for increased future capacity flows. Each cell would be fully isolatable so that any cell could be out-of-service at any one time, allowing independent operation of any or all of the other cells.

2.5 PROJECT CONSTRUCTION AND OPERATION

2.5.1 CONSTRUCTION

INTAKE FACILITY

As discussed previously, two intake configuration options and two location options are currently being considered: (1) an In-River Intake and Pump Station facilities with flat plate screens (Figures 2-11a and 2-12a); and (2) an In-Bank Intake with Pump Station facilities (Figures 2-11b and 2-12b). Construction of the intake would require extensive cofferdam construction and dewatering. To minimize construction activity in the river, the intake and pump station would be constructed in two 80-mgd capacity increments. For initial construction, the piles may or may not be driven for the ultimate 160-mgd capacity, concrete work completion would support 80 mgd, and mechanical would support only the initial 30-mgd capacity.



SOURCE: Montgomery Watson Harza and Environmental Science Associates, 2005

Figure 2-17
Conceptual Site Plan for Membrane Filtration Water Treatment Plant

Construction of either intake configuration would involve limited dredging of material in the San Joaquin River (deep water channel) and adjacent levee, and placement of fill including concrete and riprap. The estimated quantity of material for each alternative at the ultimate 160-mgd capacity is presented below
(Table 2-5).

TABLE 2-5
ESTIMATED QUANTITY OF DREDGE/FILL FOR BOTH INTAKE CONFIGURATIONS

Description	Material	Cubic Yards
Dredge Material within Cofferdam	River Bottom Material (Soil)	5,840 (Dredge)
Tremie Plug in Cofferdam	Lean Concrete	4,100 (Fill)
Riprap around Cofferdam	Riprap (Stone)	256 (Fill)
Behind Existing Levee	Native/Imported Material (Soil)	26,000 (Fill)
Dredge Material within Riverbank	Riverbank Material (Soil)	6,900 (Dredge)
Earth Fill within Riverbank	Imported Material	1,300 (Fill)
Riprap around Cofferdam	Riprap (Stone)	833 (Fill)
Behind Existing Levee	Native/Imported Material (Soil)	6,700 (Fill)

Construction of either intake configuration would take approximately 15 months. Table 2-6 provides a brief description of the sequential major construction activities associated with the construction of both the in-river intake and in-bank intake configurations.

Table 2-6 shows the construction activities and sequencing of events with the anticipated construction crew and their on-site duration.

The primary construction equipment would be:

- Articulated trucks
- Rear dump 18-wheel trucks
- Track-type tractor
- Excavator
- Tracked excavators
- Wheel loaders
- Concrete pump trucks
- Graders
- Backhoes
- Compactors
- Scrappers
- Crawler crane
- Scaffolding
- Manlifts

In-River Intake and Pump Station

The structure would be constructed behind an encircling temporary cofferdam constructed of sheet piling. The foundation would consist of a reinforced concrete slab supported by piling, with conventional reinforced concrete walls extending up to the operating floor level. A structural steel framing system would be used to support the enclosure and bridge crane assembly, with cladding and detailing to provide desired architectural features.

TABLE 2-6
INTAKE STRUCTURE AND PUMP STATION CONSTRUCTION ACTIVITIES AND SEQUENCING

Construction Phase	Construction Activity	In-River Intake	In-Bank Intake	Anticipated Construction Crew	On-Site Duration
Site Preparation	Clear and grub	X	X	9	2 weeks
	Mobilize construction equipment and materials	X	X	9	1 week
	Stage levee setback construction	X	X	12	2 weeks
	Prepare levee foundation and ground improvements	X		12	2 weeks
Excavation and Sitework	Install settlement and slope monitoring equipment	X	X	6	1 week
	Complete levee construction and drain system	X	X	15	3 weeks
	Construct sheet pile wing walls		X	5	1 week
	Construct temporary sheet pile cofferdam	X	X	5	2 weeks
	Excavate intake structure	X	X	15	2 weeks
	Install levee rip-rap		X	5	1 week
	Dewater cofferdam	X	X	3	1 week
Structural Facilities	Place piles and pour concrete tremie	X	X	8	3 weeks
	Form and pour intake structural slab and walls	X	X	11	12 weeks
	Install structural steel	X	X	11	4 weeks
Process Mechanical	Install piping and mechanical equipment	X	X	10	10 weeks
Electrical Instrumentation	Install electrical and control equipment	X	X	7	4 weeks
Architectural	Complete finish work	X	X	7	3 weeks
Sitework	Remove cofferdam	X	X	5	2 weeks
	Complete land-side facilities	X	X	7	4 weeks
Startup and Testing		X	X	3	3 weeks

In-Bank Intake and Pump Station

A setback levee would be constructed behind the existing levee to provide for flood protection to the land on Empire Tract. The area between the existing and setback levees would be filled to provide a level area above flood elevation for access to the pump station and ancillary facilities. A temporary cofferdam would be constructed on the waterside of the levee to facilitate construction of the intake structure, fish screens, and levee protection. Pumps and electrical equipment would be located on the structure top slab at approximately elevation 12 feet msl. The pumps and motors would be suitable for outdoor installation with instrumentation and control equipment housed in a climate controlled building.

WATER PIPELINES

Raw Water Pipelines

Except for special crossings, the raw water pipelines 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. In areas where open cut trenching is not possible due to limited construction area, geotechnical conditions, or sensitive areas (i.e., intersection of Empire Tract Road and Eight Mile Road, Bishop Cut, Honker Cut, Union Pacific Railroad tracks, and I-5), trenchless construction techniques (e.g., jack and bore, horizontal directional drilling, or microtunneling) would be employed. Approximately 235,000 cubic yards of material will be excavated for the pipelines.

Pipeline installation could occur at a rate of about 350 feet per day west of I-5, where the raw water pipelines would cross open land or low-use sections of roadways. In more developed areas east of I-5, where there are narrow construction corridors, higher traffic volumes, and more utilities, the installation rate is expected to average approximately 200 feet per day. Assuming these rates of construction, it is anticipated that construction of the initial raw water pipeline would take approximately 12 to 13 months. The time of completion would also depend upon the number of separate crews constructing the pipeline. At this time, it is anticipated that at least two crews would be working on the pipeline, with a third crew responsible for tunneling activities. Approximately 14 crew members would be needed for pipeline construction: a foreman/ supervisor, a grade setter, four operators, six laborers/pipe fitters, and two welders.

In agricultural areas where the pipeline would not be in road right-of-way, it would be buried a minimum cover of seven feet to minimize future conflict with farming operations (e.g., construction of irrigation canals, tilling, and deep-ripping), and to provide a vertical corridor for future small diameter utilities. In other areas, the pipeline would be buried deeper than five feet to avoid potential conflicts with existing and future adjacent utilities, which are usually buried from 3.5 to five feet.

In open areas with sufficient space, an 80-foot wide corridor for construction would be utilized to maximize construction efficiency. Sufficient space would be available to allow the contractor to cast the spoil to the side of the trench, install the pipe, and backfill the trench using the spoil. Likewise, pipe could be staged along the alignment in advance of the pipe installation operation.

In areas encumbered by existing improvements, high-volume roadways, or environmentally sensitive areas; a narrower construction corridor would be used. The minimum practicable construction corridor would be 47 feet, which would provide space for the width and turning movement of equipment such as a large excavator. All other construction equipment (i.e., spoil haul trucks, pipe laying crane, pipe delivery trucks) would share the remaining corridor width. Because of the limited available construction corridor, the soil excavated from the trench (spoil) would have to be hauled away from the trenching operation and hauled back during the backfill operation. Pipe would be unloaded directly from delivery trucks as needed.

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.

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 west of I-5, dewatering would be necessary prior to trench excavation. Construction would be confined within a maximum 80-foot wide construction corridor. Table 2-7 provides a brief description of the sequential major construction activities associated with the construction of the raw water pipeline.

TABLE 2-7
RAW AND TREATED WATER PIPELINE SEQUENTIAL CONSTRUCTION ACTIVITIES

Construction Activity	Raw Water Pipeline	Treated Water Pipeline
Construction staking	X	X
Dewatering system installation (where required)	X	
Asphalt cutting (where required)		X
Trench excavation	X	X
Trench bedding installation and preparation	X	X
Pipe installation	X	X
Joint welding (if required)	X	X
Joint diaper installation (if required)	X	X
Initial backfill (imported material)	X	X
Excavated native soil classification, segregation, and moisture conditioning	X	X
Final backfill (with appropriate backfill material)	X	X
Surface restoration (pavement replacement if required)	X	X
Removal of dewatering system	X	
Disinfection		X
Testing and startup	X	X

The primary construction equipment would be:

- Mass excavator (2)
- Wheel loader (1)
- Water truck, 10-wheel
- Grove crane
- Smooth drum vibratory compactor (1)

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 the 54-inch pipeline would be 7 to 8 feet wide, and 8.5 to 9.5 feet wide for the parallel 72-inch diameter pipeline. The future parallel 72-inch diameter pipeline would be a minimum distance of 10.5 feet from the 54-inch diameter pipeline to allow for minimal interference from the 54-inch diameter pipeline and for maintenance and operation of both pipelines.

In areas that contain shallow groundwater, dewatering activities would be required. Groundwater encountered during construction that can not 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. On upland areas sprinkler systems could be used to disperse the water in farmers' fields. Discharges would comply with the Central Valley Regional Water Quality Control Board's (CVRWQCB) 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 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, microtunneling, 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 such as the intersection of Empire Tract and Eight Mile Roads, Bishop Cut, Honker Cut, Union Pacific Railroad tracks at Eight Mile Road, and I-5 at Eight Mile Road. Bore and jack employs an augur or hand excavation to remove material ahead of the pipe, while microtunneling uses a laser guided and remotely controlled Microtunnel Boring

Machine (MTBM). 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 microtunneled areas would be identified prior to construction to determine the extent of dewatering required at tunnel pits. Dewatering of launching and receiving pits may 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.

Treated Water Pipelines

Except for special crossings, the treated water pipelines would be installed using open cut trenching as described for the raw water pipelines. In developed areas, a vertical or near vertical trench would be constructed to limit replacement of the structural road and reduce the width of the construction corridor. Trench depth will range from five to 12 feet depending on pipe diameter and depth of cover. All excavation is expected to be above groundwater; however, limited perched groundwater may be encountered near slough crossings. Typical open cut installation rates will vary from 300 to 400 feet per day depending on the number of existing utilities encountered during excavation, required traffic control, and hours of work.

In areas where open cut trenching is not possible due to limited construction area, geotechnical conditions, or sensitive areas (i.e., I-5 at Eight Mile Road; Pixley Slough at Davis Road, Eight Mile Road, and Lower Sacramento Road; Union Pacific Railroad tracks at Eight Mile Road; and Bear Creek at West Lane), trenchless construction techniques would be employed as described for raw water pipelines.

The treated water pipeline would parallel the east side of Lower Sacramento Road south to the south side of Eight Mile Road. A minimum 10-foot horizontal separation would be provided between the raw water and treated water pipelines to meet DHS standards and facilitate construction. Table 2-7 provides a brief description of the sequential major construction activities associated with the construction of the raw water pipeline.

The primary construction equipment would be:

- Mass excavator (2)
- Wheel loader (1)
- Smooth drum vibratory compactor (1)

The minimum required construction corridor would be between 37 and 47 feet depending on pipe diameter and construction means and methods. Two staging areas would be required along the pipeline alignment for storing equipment and materials, and a construction office trailer. Approximately seven crew members would be required: a foreman/supervisor, a grade setter, three operators, and two laborers/pipe fitters. Trenchless construction would occur in parallel with the activities above.

WATER TREATMENT PLANT

The WTP would be constructed on a 126-acre parcel, with 56 acres devoted to the plant development and 86 acres left as farmland. Construction is expected to take approximately two years. Approximately 150,000 cubic yards of earth would need to be excavated 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 sludge lagoons. The treated water pumping station would be located at the greatest depth, 30 feet below the surface. Facilities that would be constructed above ground would include: operations and administration building, electrical building, chemical building, access road, and washwater treatment structure. Each of these structures would be single-story, with the chemical building being the tallest structure at 24 feet.

Concrete would be the primary construction material for plant structures. Major process piping and chemical storage tanks would be made of steel. The major construction phases for the WTP would be:

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

The primary construction equipment would be:

- Articulated trucks
- 18-wheel dump trucks
- Track-type tractors
- Excavators
- Wheel loaders
- Scrappers
- Backhoes
- Graders
- Compactors
- Concrete pump trucks
- Pavers
- Manlifts
- Scaffolding
- Forklifts

Clearing and Grubbing

Survey staking would be used to define the limits of the WTP site. Underbrush, vines, and small trees that would interfere with construction and operation of the WTP would be removed from the site. The vacant single family residence and outbuildings on-site would be demolished and removed.

Approximately ten clearing and grubbing crew members would be needed for this phase of construction: nine equipment operators and a supervisor/foreman.

Excavation and Sitework

After the WTP 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 basins and sludge lagoons 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. Sitework would involve installing large underground pipes (6-inch diameter or larger), manholes, structural foundations, curbs, gutters, and sidewalks.

Approximately 12 excavation and sitework crew members would be needed for this phase of construction: seven equipment operators, four pipe layers, and a supervisor/foreman.

Structural Facilities

This phase would consist of compacting and preparing the soil for all structural facilities. Prior to pouring concrete, 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.

Approximately 14 structural facilities crew members would be needed for this phase of construction: three carpenters to cut forms for erection of the facilities; four rebar crew members to install structural steel; two concrete workers to pour and finish the concrete; two or three electricians to route conduit through the structural slabs; and two equipment operators.

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.

Approximately six paving and striping crew members would be needed for this phase of construction: five paving and striping crew members and one grading operator.

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 building and facilities are secured, flow meters, level probes, pressure meters, and other instrumentation such as process analyzers would be installed.

Approximately seven crew members would be needed for this phase of construction: four electricians and three piping specialists.

Architectural and Landscaping

During the architectural phase, several specialized crews would apply stucco finishes, tile and flooring, windows, paint, and wall fixtures. Each crew would consist of two or three members working throughout the WTP site and within the facilities. A five-member landscaping crew would plant trees, hydroseed, and install irrigation lines.

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 understand how each piece of equipment would operate and function at the WTP. Under City supervision, the equipment vendors would startup and test the equipment on-site to guarantee that pumps, mixers, gauges, supervisory control and data acquisition (SCADA) system, and other operating equipment are functional and able to meet design standards.

This phase of construction would not involve any heavy equipment. A three-member crew would assist with any equipment adjustments or replacements that might be required.

STAGING AREAS

At various locations within the 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 may be used for the duration of the project. In other cases, as pipeline construction moves along the route, the staging area may 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 80-foot construction corridor along the pipeline alignment.

2.5.2 PROJECT OPERATIONS AND MAINTENANCE

INTAKE FACILITY

The operation of the intake facility would be primarily by remote control from the WTP. Raw, untreated water would be conveyed from the intake facility to the WTP. No permanent employees or daily worker trips would be required to operate the intake system; however, periodic inspection and maintenance would be required.

WATER PIPELINES

The operation of the raw and treated water pipelines would be by remote control from the WTP. No permanent employees or daily worker trips would be required to operate the pipeline system; however, periodic inspection and maintenance would be necessary.

WATER TREATMENT PLANT

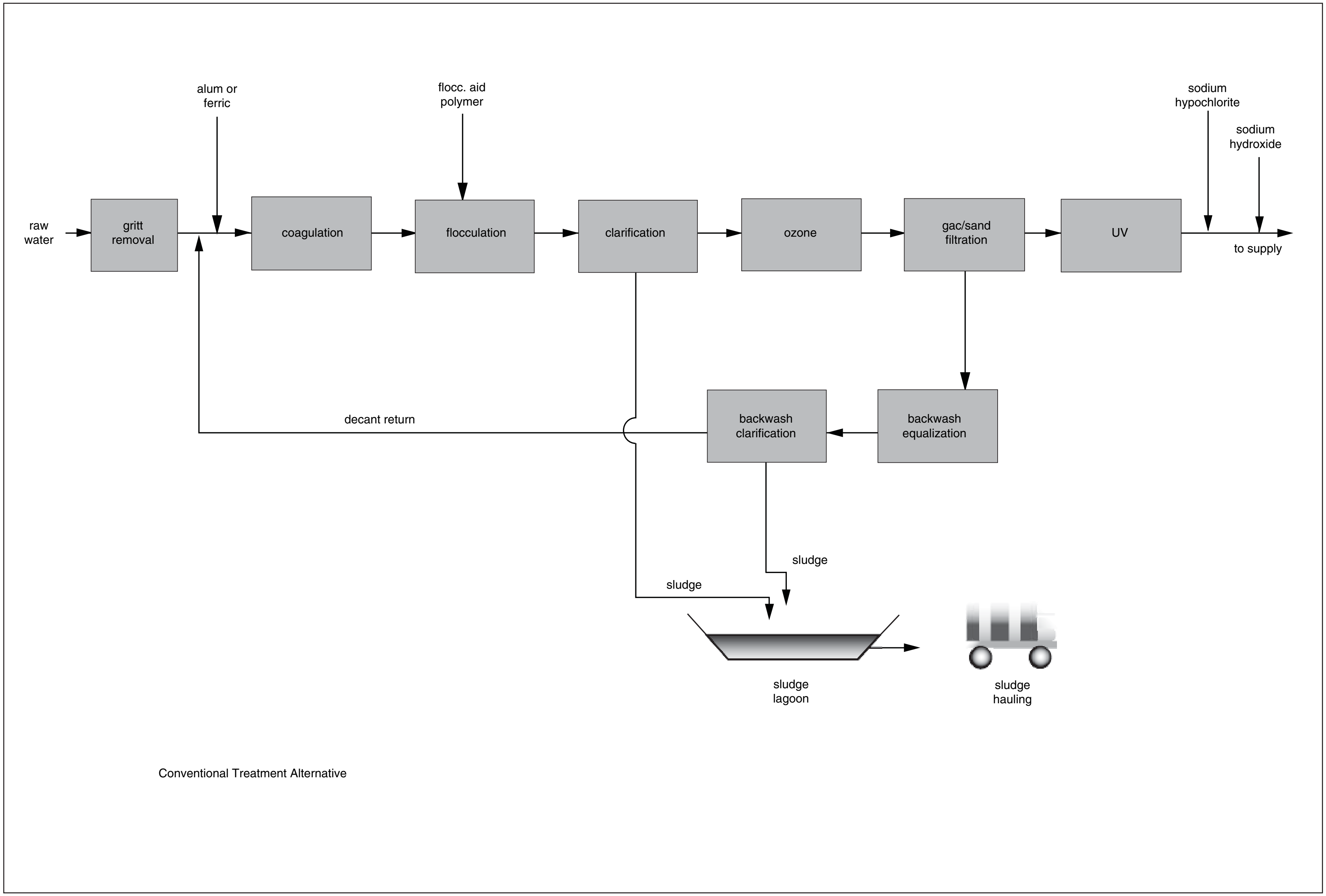
The WTP would operate continuously, 24 hours per day, every day of the year at various flow rates during the year with ongoing operations and maintenance. For the conventional WTP, it is expected that no more than 15 individuals would be on-site at any one time for typical operation and maintenance of the WTP. Several types of staff at varying levels would be on-site throughout the day: WTP supervisor (1), WTP operators (4), laboratory technician (1), electrician (1), mechanic (1), machinist (1), instrument technician (1), and administrative staff (1). Most staff would be on-site during daytime hours (approximately 7:00 am to 5:00 pm). However, it is expected that WTP operators (approximately four per shift) would be on-site at all times (i.e., 24 hours per day). DHS will require the WTP to have a Treatment Grade 5 operator to supervise the operation and maintenance and Treatment Grades 2, 3, and 4 operators for the various plant operation shifts.

A membrane filtration WTP would require fewer operators than a conventional WTP during normal operation. The facility would be staffed with three WTP operators. The remaining personnel requirements would be the same as the conventional WTP described above.

The WTP would be either: (1) a conventional treatment plant using ozone, deep bed granular activated carbon gravity filters, and ultraviolet disinfection; or (2) a membrane treatment plant with conventional pre-treatment and using powdered activated carbon. The process flow schematics for these two alternatives are illustrated in Figures 2-18 and 2-19.

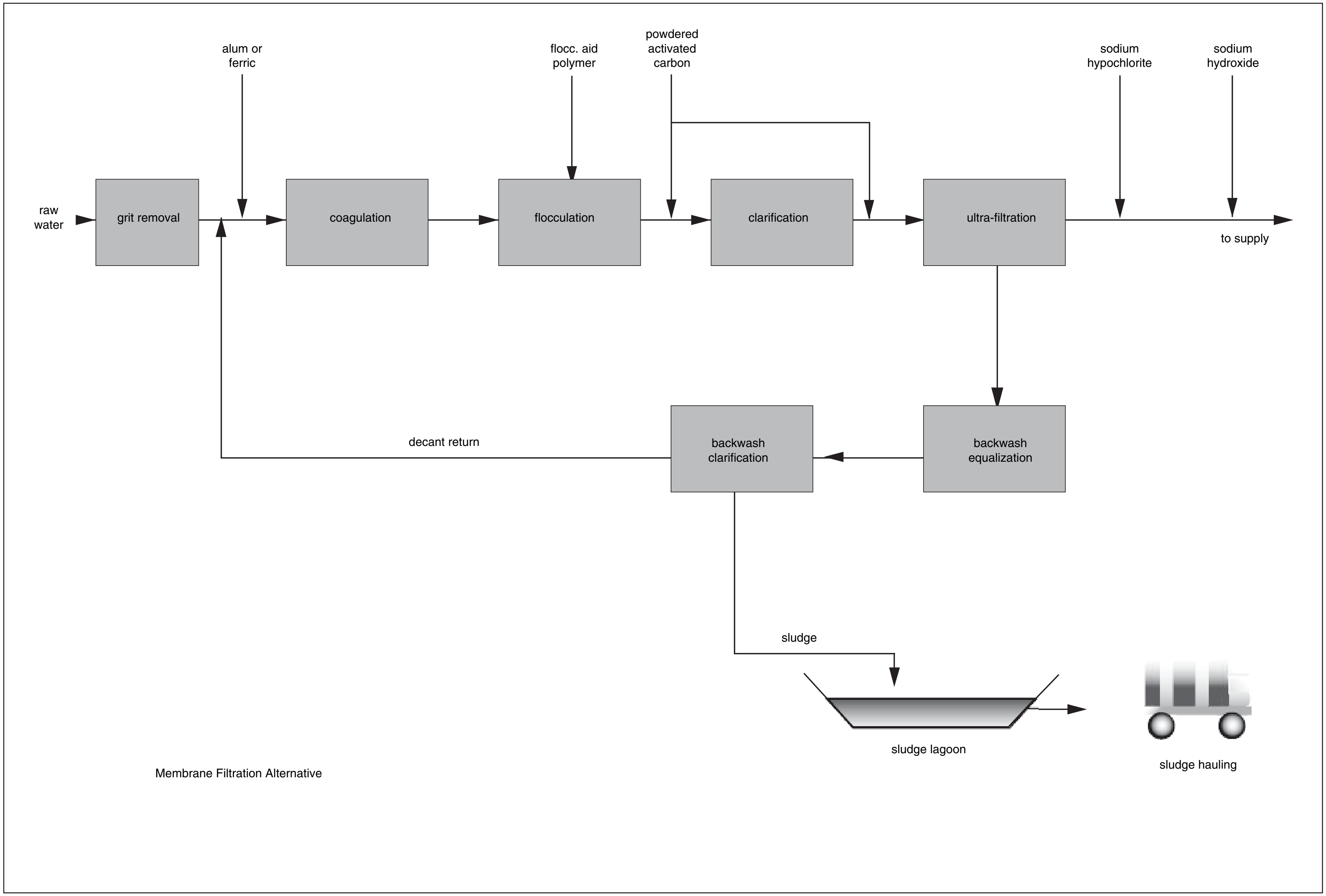
Solids Handling

Waste streams would include grit from the grit basins, 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 sludge lagoon decant water would be treated with a polymer and then stored in an equalization basin. Solids from the grit and equalization basins and sludge from the sedimentation basin would be sent to sludge lagoons for drying. Four lagoons would be provided to allow for cycling and settling periods. The sludge lagoons would be cycled



SOURCE: COSMUD et al., 2003; and Environmental Science Associates, 2005

Figure 2-18
Conventional Water Treatment Plant Schematic



SOURCE: COSMUD et al., 2003; and Environmental Science Associates, 2005

Figure 2-19
Membrane Filtration Water Treatment Plant Schematic

on four-month cycles. Solids generation for the four-month winter period from December through March would be an average of 4,400 pounds per day for the 30 mgd WTP. Solids generation for the remaining eight months of the year (April through November) would be an average of 5,450 pounds per day. 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.

Chemical Feed and Supply Systems

Chemicals which are anticipated to be used at the WTP are listed in Table 2-8. Chemical injection points are shown in Figures 2-18 and 2-19.

Table 2-9 lists the amounts and storage requirements of each chemical that would be delivered and stored at the WTP. Chemicals would be stored the chemical building.

TABLE 2-8
CHEMICALS ANTICIPATED TO BE USED AT THE DWSP WTP

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
Activated carbon	Taste and odor, organic control	Sedimentation
Sodium hypochlorite	Disinfection residual	Filter Influent Channel
Citric acid	Membrane cleaning	Membrane Facility
Sodium bisulfite	Membrane cleaning	Membrane Facility

Source: MWH, 2005.

TABLE 2-9
CHEMICAL FEED AND STORAGE REQUIREMENTS FOR 30-MGD WTP

Chemical	Form	Days Storage	Storage Quantity	Storage Containers
Aluminum sulfate	Liquid	30 days	20,500 gallons	2 – 10,000 gallons fiberglass tanks
Cationic polymer	Liquid	14 days	400 gallons	2 – 300 gallon bins
Sodium hydroxide	Liquid	7 days	3,250 gallons	2 – 5,000 gallon horizontal steel drums
Anionic/ nonionic polymer	Solid or Liquid	14 days	6,000 pounds	120 – 50 pound bags or 12 – 55 gallon drums
Powdered activated carbon	Solid	30 days	40,000 pounds	10 – 4,000 pound supersacks
Sodium hypochlorite	Liquid	30 days	9,182 gallons	2 – 5,000 gallon fiberglass tanks
Citric acid	Liquid	60 days	210 gallons	1 – 270 gallon polyethylene tank
Sodium bisulfite	Liquid	60 days	105 gallons	1 – 150 gallon polyethylene tank
Oxygen	Liquid	10 days	5,000 gallons	1 – 10,000 gallon steel tank

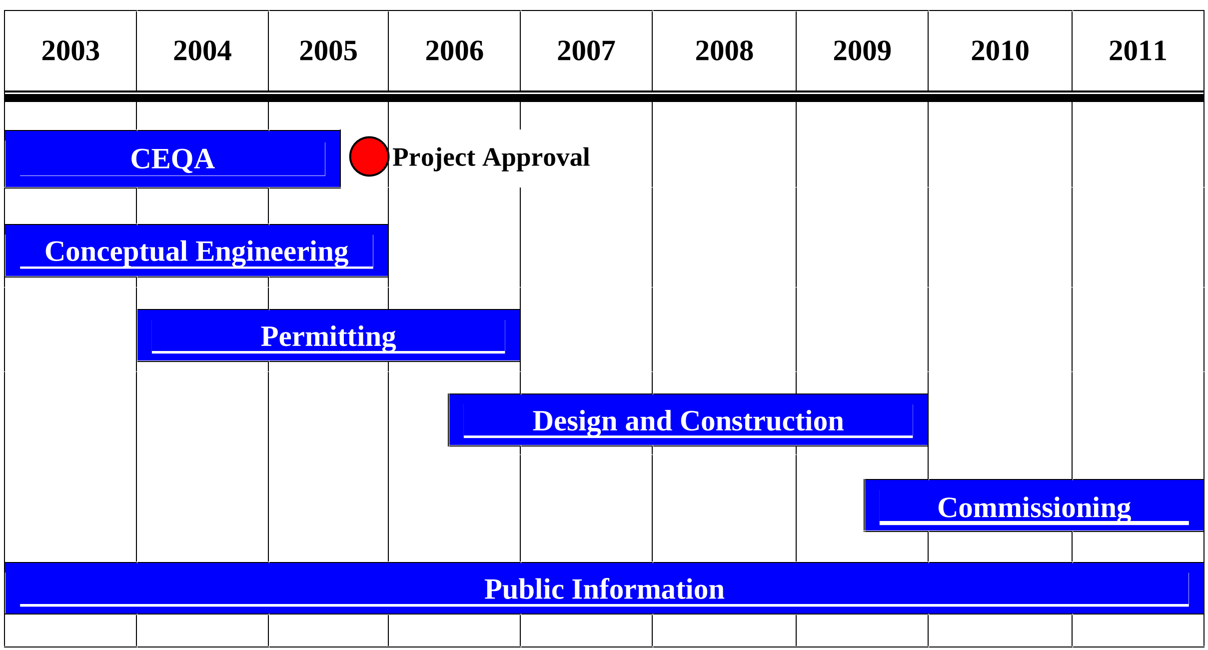
Source: MWH, 2005

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 likely be stored in the operations and administration building. Diesel storage (approximately 1,200 gallons) 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.

2.6 PROJECT IMPLEMENTATION SCHEDULE

Implementation of the DWSP would require the successful completion of the tasks shown on Figure 2-20. Figure 2-20 illustrates the schedule for implementation of the proposed DWSP. The schedule is based on activities starting with the initiation of the EIR process and through construction and project start-up. Based on this schedule, the City anticipates that surface water deliveries from the 30 mgd WTP would begin in the fall of 2009.

FIGURE 2-20
DWSP IMPLEMENTATION SCHEDULE



2.7 REGULATORY REQUIREMENTS AND PERMITS FOR THE PROJECT

Table 2-10 lists the various federal, state, local, and other permits/approvals that would be required for construction and operation of project facilities.

TABLE 2-10
REGULATORY REQUIREMENTS AND PERMITS FOR DWSP FACILITIES

Agency	Type of Approval	Project Component
Federal Agencies		
U.S. Army Corps of Engineers	Clean Water Act Section 404 Permit	Intake facility, raw water pipelines
	River & Harbor Act Section 10 Permit	Intake facility
U.S. Fish and Wildlife Service	Federal Endangered Species Act compliance (Section 7)	Intake facility, raw and treated water pipelines, WTP
National Marine Fisheries Service	Federal Endangered Species Act compliance (Section 7)	Intake facility
U.S. Coast Guard	Private Aids to Navigation Permit	Intake facility
State Agencies		
State Water Resources Control Board	Water Rights for Diversion from San Joaquin River	Intake facility
	Clean Water Act Section 401 Water Quality Certification	Intake facility, raw water pipelines
California Department of Fish & Game	State Endangered Species Act compliance	Intake facility, raw and treated water pipelines, WTP
	Section 1601 Streambed Alteration Agreement	Intake facility, raw and treated water pipelines
State Reclamation Board	Encroachment Permit	Intake facility, raw water pipelines
California Department of Transportation	Encroachment Permit	Raw and treated water pipelines
Central Valley Regional Water Quality Control Board	National Pollutant Discharge Elimination System Construction Storm Water Permit	Intake facility, raw and treated water pipelines, WTP
	General Order for Dewatering and Other Low Threat Discharge to Surface Waters Permit	Intake, raw and treated water pipelines, WTP
State Historic Preservation Office	National Historic Preservation Act Section 106	Intake facility, raw and treated water pipelines, WTP
California Department of Health Services	Drinking Water Treatment Plant Permit	WTP
Local/Other Agencies		
San Joaquin Valley Air Pollution Control District	Authority to Construct	Intake facility, WTP
	Permit to Operate	Intake facility, WTP
San Joaquin County	Encroachment Permit	Raw and treated water pipelines
Union Pacific Railroad	Crossing Permit	Raw and treated water pipelines
Reclamation District 2029 (Empire Tract)	Endorsement	Intake facility, raw water pipelines
Reclamation District 2044 (King Island)	Endorsement	Intake facility, raw water pipelines
Reclamation District 2042 (Bishop Tract)	Endorsement	Intake facility, raw water pipelines
Port of Stockton	Construction Permit	Intake facility

2.8 REFERENCES

Calaveras County Water District (CACWD). 1996. County Waster Master Plan. Calaveras County Water District.

California Department of Fish and Game (CDFG). 2000. Fish Screening Criteria. Native Anadromous Fish and Watershed Branch, CDFG. June 19, 2000. Available at: http://www.dfg.ca.gov/nafwb/fishscreencriteria.html.

California Department of Health Services (DHS). 2004. New Drinking Water Standard for Arsenic. July 28, 2004. Available at: http://www.dhs.ca.gov/ps/ddwem/chemicals/arsenic/newmcl.htm.

Carollo Engineers. 1996. Recycled Water Market Evaluation. Prepared for the City of Stockton Municipal Utilities Department. March 1996.

City of Stockton. 1990. City of Stockton General Plan: Policy Document. Adopted January 22, 1990; last amended November 3, 1998.

City of Stockton and OMI Thames Water. 2004. 2003 Drinking Water Quality Report.

City of Stockton Department of Municipal Utilities (Stockton MUD). 2000. Urban Water Management Plan 2000 Update, Public Review Draft. December 2000.

City of Stockton Municipal Utilities Department (Stockton MUD), Environmental Science Associates, MWH Americas, and West Yost & Associates. 2003. Delta Water Supply Project Engineering Feasibility Study. January 2003. Available at: http://www.stockton.gov/MUD/.

Montgomery Watson Harza (MWH). 2004. Stockton District Arsenic Blending Plan. Prepared for California Water Service Company, Stockton District.

Montgomery Watson Harza (MWH). 2005. Water Treatment Plant Conceptual Process and Layout Technical Memorandum. City of Stockton Delta Water Supply Project. Prepared for the City of Stockton Municipal Utilities Department. March 2005.

National Marine Fisheries Service (NMFS). 1997. Fish Screening Criteria for Anadromous Salmonids. NMFS, Southwest Region. Available at: http://www.swr.ucsd.edu/hcd/fishscrn.htm

CHAPTER 3

ENVIRONMENTAL ANALYSIS – PROJECT FACILITIES

CHAPTER 3

ENVIRONMENTAL ANALYSIS – PROJECT FACILITIES

3.1 INTRODUCTION TO ENVIRONMENTAL ANALYSIS

Sections 3.2 through 3.11 in this Draft EIR provide an integrated presentation of the existing conditions, regulatory framework, environmental impacts, and mitigation measures for each environmental issue area. Potential effects associated with the construction and operation of DWSP facilities, including cumulative effects are also identified along with recommended mitigation measures to avoid or lessen identified impacts. In cases where no mitigation is available, this conclusion is noted.

As required by the CEQA Guidelines, the setting describes the environment in the project area and vicinity "as it exists before the commencement of the project." The setting is presented from project site, local, subregional and/or regional perspectives, as appropriate to each environmental topic.

Impacts are identified and the level of significance is determined. This Draft EIR uses the following terminology to describe environmental effects of the proposed DWSP:

- **Significance Criteria:** A set of criteria used by the lead agency to determine at what level or "threshold" an impact would be considered significant. Significance criteria used in this EIR include CEQA Guidelines Appendix G; factual or scientific information; regulatory standards of local, state, and federal agencies; and goals, objectives, and policies identified in the pertinent general plans.

- **Less than Significant Impact:** A less than significant impact would cause no substantial change in the environment (no mitigation required).

- **Potentially Significant Impact:** A potentially significant impact may cause a substantial change in the environment; however, additional information is needed regarding the extent of the impact. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact.

- **Significant Impact:** A significant impact would cause a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of project effects using specified significance criteria. Mitigation measures and/or project alternatives are identified to reduce project effects to the environment.

- **Significant Unavoidable Impact:** A significant unavoidable impact would result in a substantial change in the environment that cannot be avoided or mitigated to a less than significant level if the project is implemented.

- **Cumulative Significant Impact:** A cumulative significant impact would result in a substantial change in the environment from effects of the proposed project as well as surrounding projects and reasonably foreseeable development in the surrounding area.

According to the CEQA Guidelines Section 15382, a significant impact is "… a substantial, or potentially substantial, adverse change in any of physical conditions within the area affected by the project …" For each category of physical condition evaluated in this EIR, criteria for significance have been developed using the CEQA Guidelines, city and county standards, or the "significance thresholds" of federal, state, regional, or local agencies. Significance criteria vary for each environmental issue analyzed in this Draft EIR and are defined at the beginning of each impact analysis section.

Consistent with CEQA Guidelines Section 15370, mitigation follows a recommended strategy sequence as follows:

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

Following the discussion of each significant impact there is a summary statement of the level of significance after mitigation to determine if the impact has been reduced to less than significant or remains significant unavoidable. For impacts that are judged to be less than significant, no mitigation is required and none is proposed.

3.2 LAND USE, RECREATION, AND AESTHETIC RESOURCES

This section provides an analysis of potential impacts to land use, recreation, and aesthetics that would result from implementation of the DWSP. The analysis includes a description of the baseline conditions, the associated regulatory framework including all applicable land use policies, the methodology, and the impact assessment.

3.2.1 SETTING

This setting provides an overview of regional and site-specific information related to land use, agriculture, recreation, and aesthetics.

REGIONAL SETTING

The proposed DWSP would be located in an unincorporated area of San Joaquin County, immediately north and west of the City. The City of Lodi is approximately four miles north of the project area. The proposed DWSP and surrounding land uses are shown in Figure 3.2-1.

San Joaquin County is one of California's major agricultural centers. According to the California Department of Food and Agriculture (CDFA), the County ranked sixth out of 58 counties in California in gross value agricultural production for 2001 and 2002 (CDFA, 2002). Agricultural production for 2002 is estimated at $1.4 billion. Leading crops and agricultural products produced in 2001 included milk ($299 million), grapes ($244 million), cherries ($99 million), and tomatoes ($91 million).

City of Stockton

The City is located near the center of San Joaquin County on the San Joaquin River and on the eastern edge of the Sacramento-San Joaquin Delta. Major highways serving the City include I-5, State Route (SR) 99, and SR 4. The City covers 36,000 acres and has a population of 261,253 (City of Stockton, 2004a). The COSMA covers approximately 81,000 acres and includes the City and the adjoining unincorporated area.

The City of Stockton, the County's largest urban area, is surrounded by productive agricultural land. Agricultural land comprises 30 percent of the COSMA. The City's current Study Area [1] covers 123,000 acres, 58 percent of which 72,000 acres is classified as Important Farmland by the California Department of Conservation's (CDOC's) Farmland Mapping and Monitoring Program (FMMP) (City of Stockton, 2004b). This compares to 64 percent of the County as a whole that is classified as Important Farmland (CDOC, 2002).

[1] The Study Area is the planning area for the current General Plan Update. The Study Area is approximately 52 percent larger than the Planning Area for the 1990 General Plan.

PROJECT AREA

The DWSP facilities would be mostly located in and adjacent to lands zoned and used for agriculture, except for the area south of Eight Mile Road, from just west of I-5 to Lower Sacramento Road. Most of the land south of Eight Mile Road is within City limits and has been or is currently being converted to residential and commercial uses. Farmlands in the project area classified as important, as well as those covered by Williamson Act contracts, are shown in Figure 3.2-2.

Raw Water Intake

The proposed intake site is located on the southwest tip of Empire Tract on the San Joaquin River. The currently vacant site can be accessed from Empire Tract Road that runs along the top of the levee. Shoreline features include an abandoned boat ramp and navigation buoys within the waterway. Inland features include pole-mounted utility lines, excess rip-rap, and other debris. The shoreline and levee area at the proposed intake site are zoned AG-40 (General Agriculture, minimum parcel size of 40 acres) by San Joaquin County, and designated Open Space/Resource Conservation in the County General Plan. The Regulatory Setting section below provides a description of the zoning and land use designations.

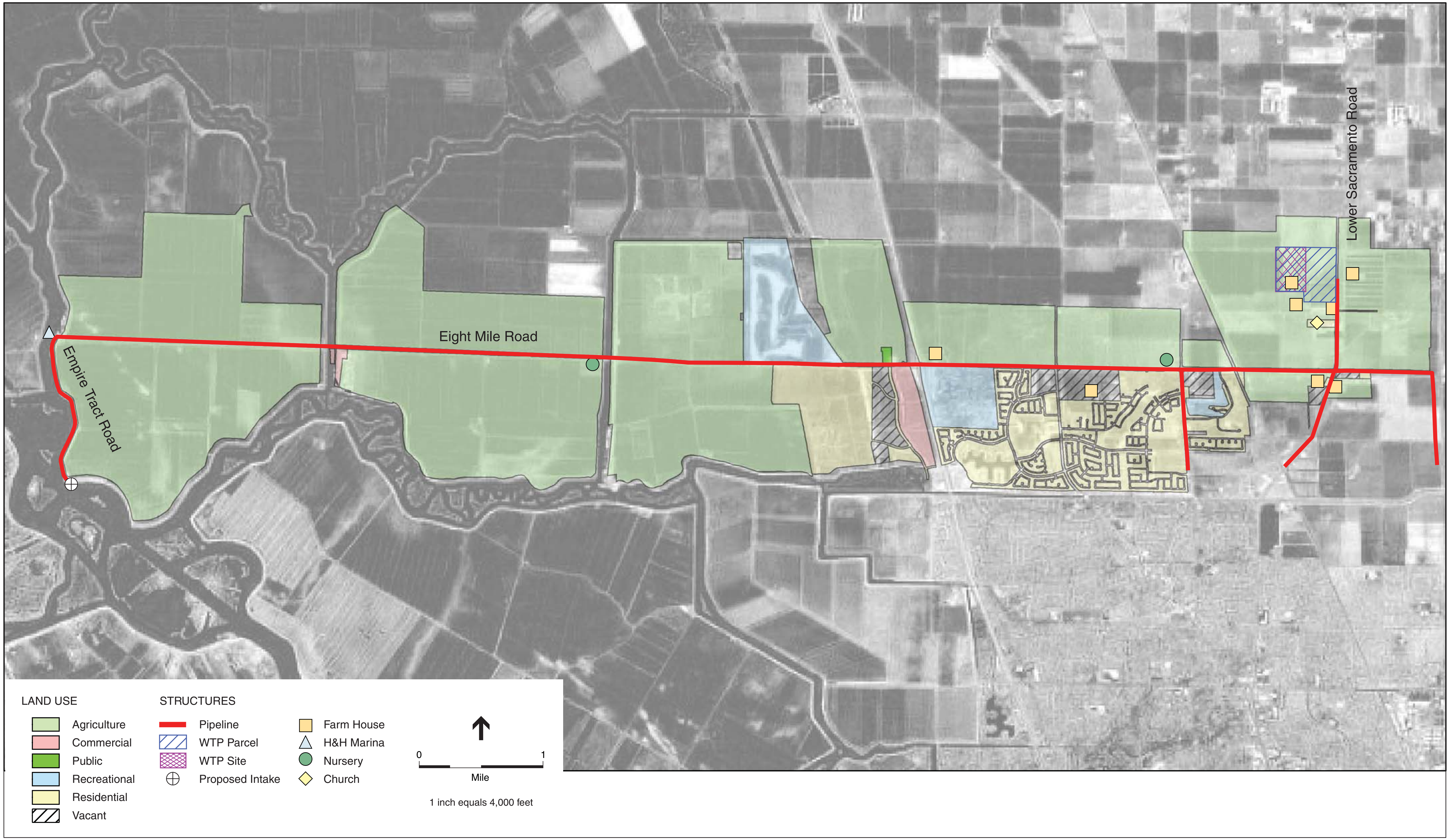
West of the intake site, several houseboat and island residences are present in the San Joaquin River and Little Connection Slough. The closest residence occurs approximately 1,050 feet west of the proposed intake site on a Delta island. The Delta islands are designated Open Space/ Resource Conservation in the County General Plan. The zoning for these islands is a combination of AG-80 and AG-40.

The property east of the intake site is used for agriculture. This 368-acre parcel is identified as Prime Farmland by the FMMP, and is subject to a Williamson Act contract (discussed below in the Regulatory Setting). This parcel is zoned AG-40 and designated General Agriculture in the County General Plan.

Raw Water Pipelines

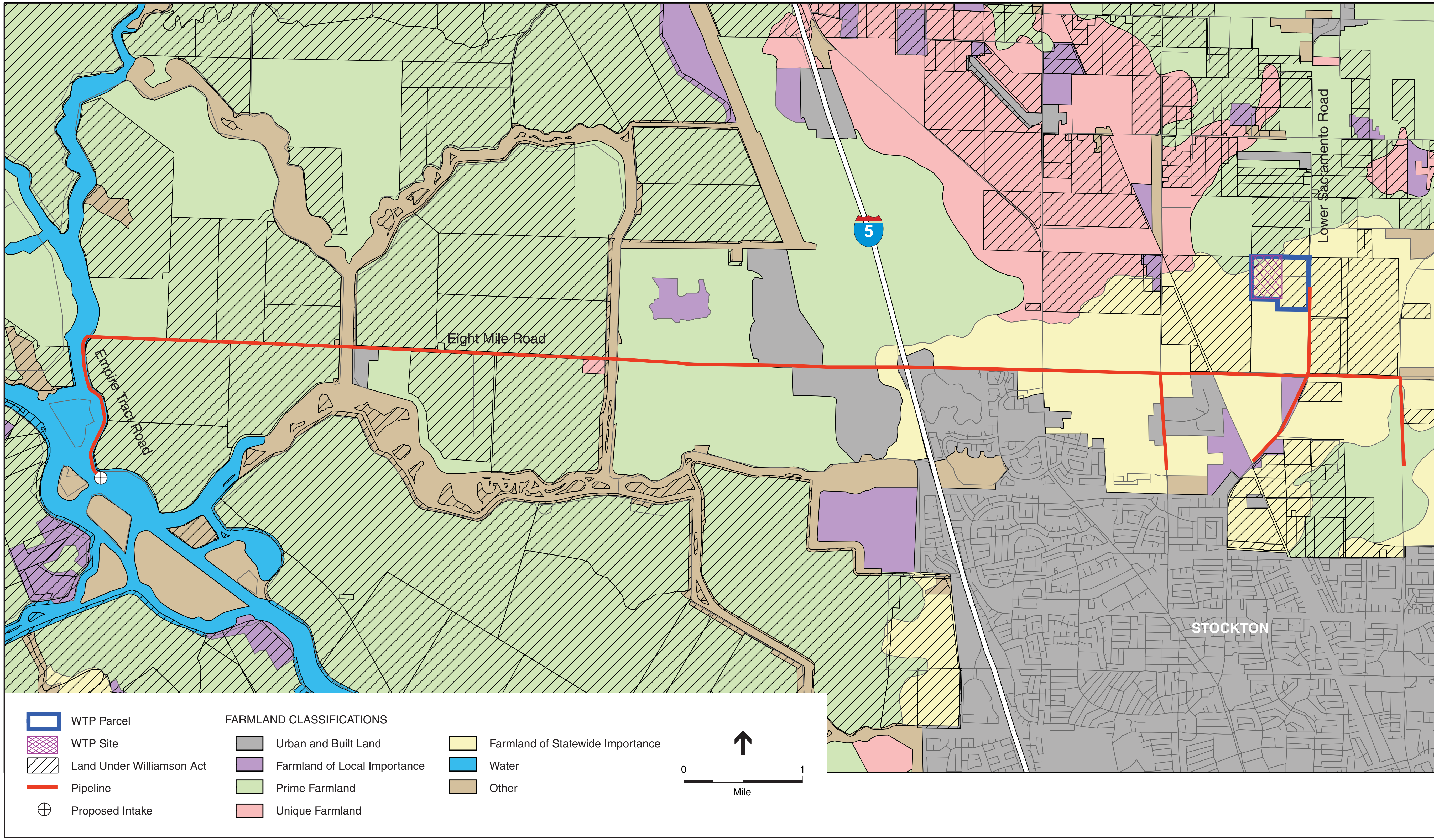
The raw water pipelines would extend from the intake facility and parallel Empire Tract levee. The pipelines would be located at least 250 feet from the toe of the levee on the landside. The area within 250 feet of the toe of the levee is under the Reclamation District’s jurisdiction; therefore, the raw water pipelines would not be located within this jurisdiction. The construction easement would be approximately 80 feet wide, except where restricted. A portion of the construction easement would be located within the Reclamations District’s jurisdictional area.

The pipelines would extend north to Eight Mile Road, where they would tunnel under the road and emerge on the north side of Eight Mile Road. The pipelines would then parallel Eight Mile Road to Pixley Slough, tunneling under Honker Cut, Bishop Cut, I-5, and the Union Pacific Railroad tracks. At Pixley Slough, the pipelines would turn northeast and parallel the slough to Lower Sacramento Road until it reaches the proposed WTP site.



SOURCE: San Joaquin County GIS, and Environmental Science Associates, 2005

Figure 3.2-1
Land Use



SOURCE: USGS 7.5' Quadrangles (Bouldin Island, Terminous, and Lodi South); California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) and Williamson Act Contracts; and Environmental Science Associates, 2005

Figure 3.2-2
Important Farmland

Empire Tract Road, adjacent to Little Connection Slough, is zoned AG-40 and designated Open Space/Resource Conservation in the County General Plan. The road is undeveloped until it merges with Eight Mile Road. The property east of the road is used for agriculture. Herman & Helen's Marina (H & H Marina) is located at the intersection of Empire Tract Road and Eight Mile Road (Figure 3.2-1). The marina includes boat launch facilities, docked houseboats, and several commercial buildings, and parking facilities.

The western end of Eight Mile Road from Little Connection Slough to the City limits west of I-5 lies in an area predominantly zoned and used for agriculture. King Island Resort marina is located at the intersection of Honker Cut and Eight Mile Road on the southeast corner. A nursery is located at the intersection of Bishop Cut and Eight Mile Road on the southwest corner. Both of these uses are consistent with the AG-40 zoning.

Midway between Bishop Cut and I-5, agricultural uses on Eight Mile Road begin to transition to urban uses. A golf course, the Reserve at Spanos Park, is located on the north side of the road. The nearly completed "Spanos Park West" is located south of Eight Mile Road within the City limits, and includes residential development and a commercial retail center.

East of I-5, the north side of Eight Mile Road is still largely agricultural, while the south side includes a mix of residential and recreational uses as well as retired agricultural land. Oak Grove Regional Park, a County recreational facility, is located at the southeast corner of I-5 and Eight Mile Road. New residential development includes "Spanos Park East" and "Waterford Estates." East of Davis Road is the Elkhorn Country Club, which includes residential development and an 18-hole private golf course.

North Lower Sacramento Road is agricultural in nature, with the exception of the Bear Creek Community Church approximately 1,000 feet south of the proposed WTP site (Figure 3.2-1).

Water Treatment Plant

The 126-acre parcel containing the WTP site is located in an unincorporated area of San Joaquin County. The parcel, currently planted in alfalfa, is zoned AG-40 and designated General Agriculture in the County General Plan. A vacant single-family residential unit is located in the southwest quadrant of the property, which would be removed prior to construction of the WTP. Immediately south of the WTP property are two rural residential parcels, one of which is still actively farmed. To the east is an agricultural parcel with a residence in the center. The property to the north is planted in vineyards, while the properties to the west are planted with field crops.

The FMMP identifies the 126-acre parcel as containing important farmland. Approximately six acres in the northwest corner are categorized as Prime Farmland; the remaining 120 acres are categorized as Farmland of Statewide Importance. The soil type of the six acres of Prime Farmland is Acampo Sandy Loam, while the soil type of the remaining 120 acres is Rioblanco Clay Loam (USDA, 1992). The 126-acre parcel is also subject to a current Williamson Act contract.

Treated Water Pipelines

The treated water pipelines would extend from the proposed WTP south on Lower Sacramento Road to Eight Mile Road. From the intersection of Lower Sacramento and Eight Mile Road, the pipeline would go south along Lower Sacramento Road, and east and west along Eight Mile Road to West Lane and Davis Road, respectively, to connect with the existing City and Cal Water distribution systems (Figure 2-15).

Davis Road is mainly within the City limits and is residentially zoned, although portions are still unincorporated. The developed segments of Davis Road consist mostly of single-family homes. West Lane is located in an unincorporated agricultural area until it reaches Morada Lane, south of the proposed connection point with the existing distribution system. It is anticipated that this area would be annexed to the City and developed for residential uses.

RECREATIONAL FACILITIES

Recreational facilities that may be affected by the construction and operation of the proposed DWSP are listed below. The potential indirect demand for recreation facilities created by the DWSP is discussed in Chapter 6, Growth Inducement Potential and Secondary Effects of Growth.

Little Connection Slough/San Joaquin River

The waterways of the Delta are used for a variety of recreational activities, including bank fishing, boating, hiking, and nature study. The banks of Little Connection Slough, which joins the San Joaquin River (and the Stockton Deep Water Ship Channel) at the proposed intake site, are accessible to recreational fishermen. The boat ramp nearest the intake site is in disrepair; however, boating launch facilities are available at the marinas described below.

Herman & Helen's Marina (H & H Marina)

This marina on Little Connection Slough is located at the intersection of Eight Mile Road and Empire Tract Road. The marina features boat launch facilities, accessory structures and parking, and permanent dock facilities for houseboats. The marina is also the site of a cable-operated ferry to Venice Island, located on the west side of Little Connection Slough.

King Island Resort

This boat launch facility is located on Honker Cut between Eight Mile Road and Disappointment Slough.

The Reserve at Spanos Park

This 18-hole public golf course is located on the north side of Eight Mile Road, 0.5 mile west of I-5.

Oak Grove Regional Park

This County regional park is located immediately east of I-5 and south of Eight Mile Road. The park covers approximately 160 acres and includes a lake with a boathouse, picnic facilities, an amphitheater, an interpretive center, and trails leading through the oak woodlands.

Elkhorn Country Club

This country club is an 18 hole-private golf course south of Eight Mile Road between Davis Road and the Union Pacific Railroad tracks. Residential development is integrated into the golf course.

VISUAL RESOURCES

Regional Character

East of the City is the Sierra Nevada Mountains, and west of the City is the Sacramento-San Joaquin Delta. Downstream of the City, the San Joaquin and Sacramento Rivers split to become a multitude of interlaced channels. The channels and extensive flood control systems created a complex of islands, many of which are below sea level. Numerous smaller streams and sloughs traverse the greater Stockton area and provide natural scenery and wildlife habitat.

Lands on the periphery of the City are primarily agricultural. However, increased housing demands are infringing on agricultural lands and new residential communities are appearing on the farmland along both I-5 and SR 99.

Visual Character and Quality of the Project Area

The proposed intake site is located in the Delta at the south end of Empire Tract Road where Little Connection Slough enters the San Joaquin River (and the Stockton Deep Water Ship Channel). The road runs atop the levee adjacent to the waterway; the banks of the levee are reinforced with rip-rap (Photo 1, Figure 3.2-3). Waterside views include several Delta islands, the closest being Ward and Tinsley Islands. The natural landscape is not intact, due to presence of residences (including houseboats) and the levee itself, which includes rip-rap reinforcement and appurtenances such as boat ramps and buoys.[2] Nevertheless, the westerly view from Empire Tract is of good quality. The inland view features disturbed land (including pole mounted utility lines, excess rip-rap, and dumped refuse), giving way to agricultural fields (Photo 2, Figure 3.2-3).

The raw water pipeline alignment would run north from the proposed intake site on Empire Tract, parallel Empire Tract levee on its landside, and then turn east at the intersection of Empire Tract

2 Intactness is defined as the integrity of the natural and built landscape, and the extent to which the landscape is free from visual encroachment (Federal Highway Administration [FHWA], 1981). Intactness is one of the considerations in identifying the quality of visual resources.

Photograph 1.

Intake site, looking south toward Tinsley Island (May 2004).

Photograph 2.

Intake site, looking north toward Empire Tract Road (May 2004).

SOURCE: Environmental Science Associates, 2004

Figure 3.2-3
Site Photographs

Road and Eight Mile Road. The view along this section of the proposed pipeline alignment is primarily agricultural

in character (Photo 1, Figure 3.2-4). Visible features include various irrigation channels, some riparian vegetation, and scattered structures. Eight Mile Road passes over bridges at Honker Cut and Bishop Cut (Photo 2, Figure 3.2-4). The agricultural landscape west of Bishop Cut is largely intact and of good quality.

As Eight Mile Road approaches I-5, the landscape becomes less intact, as agricultural lands give way to new residential and commercial areas (Photo 1, Figure 3.2-5). East of I-5, the views south of Eight Mile Road include established and developing residential areas, mixed with vacant fields, and two recreational areas (Oak Grove Regional Park and Elkhorn Country Club, discussed above). The north side is still primarily agricultural, as is North Lower Sacramento Road.

The 126-acre parcel containing the proposed WTP site is an open agricultural field. As seen from the roadway, the foreground includes a drainage ditch, and the background includes a farmhouse and some scattered trees (Photo 2, Figure 3.2-5).

Scenic Routes and Vistas

Neither the project area nor the City contains a state-designated scenic route (Caltrans, 2004). However, three county-designated scenic routes cross the project area: Empire Tract Road, Eight Mile Road west of Thornton Road, and I-5 (San Joaquin County, 1992). The proposed intake facility would be located along Empire Tract Road. Empire Tract and Eight Mile Roads are proposed raw water pipeline alignments. Neither the proposed WTP site nor the intake site would be visible from I-5.

No designated (local, state, or federal) scenic vistas are located within the project area. However, the Sacramento-San Joaquin Delta is a recognized recreational and environmental resource with high scenic value.

Sensitive Viewers

Viewer response to change is a function of viewer sensitivity and duration of exposure. Sensitivity depends on the expectations and awareness of the viewer. Residential and recreational viewers are presumed to be more sensitive than other groups, e.g., persons at work or commuting. As exposure time increases, the effect of change in the visual resource also increases.

Viewers of the proposed intake site include the residents of the nearby Delta islands, fishermen, boaters, other recreational users, and agricultural workers on the property to the east. Residential viewers are considered sensitive because their exposure is high. Recreational users also are sensitive groups, because they have presumably chosen natural areas in which to recreate. Fishermen typically have a high exposure time, while some boaters may pass by the

Photograph 1.

Eight Mile Road viewed from Empire Tract Road (May 2004).

Photograph 2.

Bridge at Bishop Cut, viewed from west side (May 2004).

SOURCE: Environmental Science Associates, 2004

Figure 3.2-4
Site Photographs

Photograph 1.

Development on Eight Mile Road, west of Interstate 5 (May 2004).

Photograph 2

WTP site, viewed from Lower Sacramento Road (May 2004).

SOURCE: Environmental Science Associates, 2004

Figure 3.2-5
Site Photographs

proposed intake site quickly. Workers in the nearby fields are not considered highly sensitive viewers, because their exposure time is sporadic.

Viewers along a portion of the pipeline alignment are potentially sensitive, because of the scenic route designation. However, travel speeds are fairly high and total exposure time is not long (although lines of sight are quite long due to the open nature of the terrain).

Viewers of the proposed WTP site would include travelers on Lower Sacramento Road (not a scenic route), the residents living south and east of the site, and the agricultural workers adjacent to the site. Of these groups, only the residential viewers have high sensitivity and exposure time.

REGULATORY SETTING

San Joaquin County General Plan

The guiding land use plan in the project area is the San Joaquin County General Plan 2010 (San Joaquin, 1992). The proposed intake site, the raw water pipelines, and the WTP are located within unincorporated San Joaquin County. The proposed treated water pipelines, while mainly within the County, extend south of Eight Mile Road into the City. The City, as a local government, is not bound by the general plan of another jurisdiction on property that it (the City) controls. However, the County General Plan is discussed below in order to identify any potential inconsistency between the proposed DWSP and those land uses allowed by the County in the project area.

The proposed intake site and the portion of the raw water pipeline alignment on Empire Tract Road are within an area designated as Open Space/Resource Conservation. Most of the parcels adjacent to the raw water pipeline alignment on Eight Mile Road are designated for General Agriculture. The proposed WTP site and the treated water pipelines outside the City limits are also in an area designated for General Agriculture. In addition, Empire Tract Road, Eight Mile Road west of Thornton Road, and I-5 are designated as scenic routes in the General Plan.

The San Joaquin County General Plan 2010 open space objective is as follows:

> To preserve open space land for the continuation of commercial agricultural and productive uses, the enjoyment of scenic beauty and recreation, the protection and use of natural resources, and for protection from natural hazards.

The following open space policies apply to the project area:

2. A Resource Conservation designation shall be used on the General Plan 2010 Map to protect significant resource areas and protect public safety.

3. Development may be permitted in Resource Conservation Areas only if proposed uses will not have significant negative impacts on the continued existence or use of the resource.

5. The County shall consider waterways, levees, and utility corridors as major elements of the open space network and shall encourage their use for recreation and trails in appropriate areas.

10. Views of waterways, hilltops, and oak groves from public land and public roadways shall be protected.

13. Development proposals along scenic routes shall not detract from the visual and recreational experience.

The following policy for preservation of agricultural lands and compatible uses applies to the proposed WTP site and portions of the raw and treated water pipeline alignments:

5. Agricultural areas shall be used principally for crop production, ranching, and grazing. All agricultural support activities and non-farm uses shall be compatible with agricultural operations and shall satisfy the following criteria:

    (a) The use requires a location in an agricultural area because of unusual site area requirements, operational characteristics, resource orientation or because it is providing a service to the surrounding agricultural area;

    (b) The operational characteristics of the use will not have a detrimental impact on the management or use of surrounding agricultural properties;

    (c) The use will be sited to minimize any disruption to the surrounding agricultural operations; and

    (d) The use will not significantly impact transportation facilities, increase air pollution, or increase fuel consumption.

San Joaquin County General Plan 2010 does not discuss public facilities in terms of land use consistency. However, the General Plan does include objectives and policies addressing utility corridors. Although these policies are intended mainly for energy distribution projects, some may be relevant to the proposed project.

Objectives

1. To protect the public and the natural environment from possible hazards associated with utility corridors.

2. To protect the scenic value of the County landscape from inappropriately located overhead utility lines.

3. To protect land uses from the placement of utility corridors across property at inappropriate locations.

Policies

2. Utility lines shall not adversely impact significant plant and animal species.

3. The County shall encourage utilities to route their facilities along property lines and where they will not interfere with agricultural operations or other land use activities.

The General Plan includes a section on water resources and quality. Although most of these objectives and policies relate to County projects serving the unincorporated areas, the following may be relevant to the proposed project:

Objectives

1. To ensure adequate quantity and quality of water resources for municipal and industrial uses, agriculture, recreation, and fish and wildlife.

2. To obtain sufficient supplemental water supplies to meet all municipal and agricultural needs.

3. To protect the groundwater basins of the County from further overdraft.

5. To recognize the surface waters of San Joaquin County as resources of State and national significance for which environmental and scenic values must be protected.

Policies

6. The replenishment of aquifers shall be supported to minimize the overdraft of groundwater.

11. Water projects shall:
    (a) incorporate safeguards for fish and wildlife; and
    (b) mitigate erosion and seepage to adjacent lands.

13. Water diversion projects shall protect the fishery, wildlife habitat, and recreation; shall ensure adequate water for County agricultural, municipal and industrial uses, and shall guarantee adequate Delta outflows for salinity repulsion.

Delta Management Plan

The project area west of Bishop Cut, which includes the proposed intake site and a portion of the raw water pipeline alignment, falls within the Primary Zone of the Sacramento-San Joaquin Delta, as defined by §29728 of the Delta Protection Act (Public Resources Code §29700 et seq.). The portion of the proposed pipeline alignment along Eight Mile Road, between Honker Cut and Thornton Road, is within the Secondary Zone of the Delta. The proposed WTP site and the treated water pipeline alignments are not within the Primary or Secondary Zone.[3]

[3] The Delta Protection Act of 1992 established the Delta Protection Commission, a new State entity to plan for and to guide the conservation and enhancement of the natural resources of the Delta, while sustaining agriculture and meeting increased recreational demand. The Act defines a Primary Zone, which comprises the principal jurisdiction of the Delta Protection Commission. The Secondary Zone is the area outside the Primary Zone and within the "Legal Delta;" the Secondary Zone is not within the planning area of the Delta Protection Commission. The Act requires the Commission to prepare and adopt a Land Use and Resource Management Plan for the Delta, which must meet specific goals." (Delta Protection Commission, Land Use and Resource Management Plan for the Primary Zone of the Delta, adopted February 23, 1995, reprinted May 2002.

Local general plans within the Primary Zone must be consistent with the Land Use and Resources Management Plan for the Primary Zone of the Delta (Management Plan), adopted by the Delta Protection Commission in 1995, and subsequent project approvals must be consistent with those general plans. Parties who believe a land use decision within the Primary Zone is inconsistent with the policies of the Management Plan may appeal the decision to the Delta Protection Commission. The following Management Plan policy relates to utilities and infrastructure plans within the Primary Zone:

P-1. Impacts associated with construction of transmission lines and utilities can be mitigated by locating new construction in existing utility or transportation corridors, or along property lines, and by minimizing construction impacts. Before new transmission lines are constructed, the utility should determine if an existing line has available capacity. To minimize impacts on agricultural practices, utility lines shall follow edges of fields. Pipelines in utility corridors or existing rights-of-way shall be buried to avoid adverse impacts to terrestrial wildlife. Pipelines crossing agricultural areas shall be buried deep enough to avoid conflicts with normal agricultural or construction activities. Utilities shall be designed and constructed to minimize any detrimental effect on levee integrity or maintenance.

San Joaquin County Development Code (Zoning Ordinance)

The County Development Code implements the County General Plan land use designations. The proposed intake site, raw and treated water pipeline alignments (excluding portions of Davis Road and Lower Sacramento Road south of Eight Mile Road), and WTP site are in or adjacent to land zoned AG-40. The purpose of the AG zone is to “preserve agricultural lands for the continuation of commercial agricultural enterprises. This zone is intended to implement the General Agriculture Land Use category of the General Plan” (San Joaquin County, 1997). The AG designation includes a minimum parcel size: 20, 40, or 80 acres.

Right-to-Farm Ordinances

San Joaquin County’s right-to-farm ordinance (Division 9, Chapter 1) declares that it is County policy to preserve, protect and encourage the development and improvement of its agricultural land for the production of food and other agricultural products. The purpose of the ordinance is to protect existing agricultural operations from encroaching non-agricultural development. Agricultural operations conducted or maintained for commercial purposes, and in a manner consistent with proper and accepted customs and standards cannot be considered a “nuisance.” Prospective property buyers in the County must be informed of the right-to-farm ordinance.

The City has a similar ordinance relating to agricultural production within the City limits (Sec. 16-013.1). The ordinance states that agricultural production is encouraged and that residents in or adjacent to agricultural lands should be prepared to accept inconveniences associated with farming (such as odor, noise, dust, smoke, and other impacts).

City of Stockton General Plan

As noted above, the majority of the project area is not within the City. Nevertheless, as a City project, it must be evaluated for consistency with the City General Plan. Sections 65401 and 65402 of the Planning and Zoning Law (Government Code) require that public works projects and land acquisitions be evaluated for consistency with the General Plan. The 1990 General Plan includes the following goal for public facilities:

> Assure that public facilities are compatible with surrounding land use and are an asset to the area.

The following general plan policy applies specifically to water facilities:

> Pursue as the City's first priority for water resources the development and acquisition of supplemental surface water sources in order to reduce the overdraft of groundwater supplies, including participation in financing conveyance facilities.

In April 2003, the Stockton City Council approved a work program to prepare an update of the City's General Plan. This update program, scheduled to conclude in 2005, will provide opportunities for public input in shaping the final plan. The updated General Plan will include ten topic areas. One of these topic areas is Land Use/Urban Growth Strategy, which will cover land use types, distribution, and intensity; population and building density; existing specific plans; and future growth areas.

Williamson Act

California's Land Conservation Act of 1965 is designed to preserve agricultural and open space lands by discouraging premature and unnecessary conversion to urban uses. The Act creates an arrangement whereby private landowners contract with counties and cities to voluntarily restrict their land to agricultural and compatible open-space uses. The vehicle for these agreements is a rolling term 10-year contract (i.e., unless either party files a "notice of nonrenewal," the contract is automatically renewed for an additional year.). In return, restricted parcels are assessed for property tax purposes at a rate consistent with their actual use, rather then potential market value.

Lands in the project area currently under Williamson Act contracts are shown in Figure 3.2-2.

3.2.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The significance criteria for this analysis were developed from criteria presented in Appendix G of the CEQA Guidelines. The proposed DWSP would result in a significant impact if it would:

Land Use

- Physically divide an established community;
- Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;

Agriculture

- Convert economically viable 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 contract in an area in which continued agriculture is economically viable; or
- Involve other changes in the existing environment that, due to their location or nature, would individually or cumulatively result in loss of economically viable farmland, to non-agricultural uses.

Recreation

- Increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated;
- Include recreational facilities or require the construction or expansion of recreational facilities which might have a significant adverse physical effect on the environment;
- Reduce access to, or interfere with the use of existing recreational facilities.

Aesthetics

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings with a state scenic highway or county scenic route;
- Substantially degrade the existing visual character or quality of the site and its surroundings;
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

METHODOLOGY

Land Use

The proposed DWSP is compared with the policies of the applicable land use plans. The standard for consistency used is based on The General Plan Guidelines, published by the Office of Planning and Research: "An action, program, or project is consistent with the general plan if, considering all its aspects; it will further the objectives and policies of the general plan and not obstruct their attainment."

Agriculture

Important farmlands are identified using data from the CDOC's FMMP (CDOC, 2002). The proposed DWSP is analyzed for potential conversion of important farmlands, conflict with agricultural zoning designations, incompatibility with an existing Williamson Act contract, or other changes resulting from the project which would remove important farmlands from agricultural production. The proposed WTP site was analyzed using the CDOC's Land Evaluation and Site Assessment Model to determine the significance of converting important farmland (CDOC, 1997).

Recreation

Potential effects related to recreation may result if a project would: (a) involve the construction or expansion of recreational facilities; (b) generate demand for additional recreational facilities; or (c) reduce or interfere with existing recreational facilities. The first issue, (a) construction or expansion of recreational facilities, does not apply to the DWSP. The second issue, (b) increased demand, is discussed in Chapter 6, Growth Inducement Potential and Secondary Effects of Growth. To analyze the last issue (c), the project area was examined for formal and informal recreational facilities that might be affected by the construction and/or operation of the DWSP.

Aesthetics

This analysis uses a common visual impact assessment methodology as described in Visual Impact Assessment for Highway Projects (FHWA, 1981). This method has three key steps: (1) identifying the visual character and quality of visual resources; (2) identifying the type, exposure, and sensitivity of viewers; and (3) identifying the potential change in visual resources. All three of these elements are considered when determining the level of visual impact, and if a substantial adverse effect would result from a project.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.2-1 provides a summary of the significant and less than significant impacts associated with the proposed DWSP facilities.

TABLE 3.2-1
SUMMARY OF IMPACTS – LAND USE, RECREATION, AND AESTHETIC RESOURCES

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
LU-1: Construction of proposed DWSP could physically divide an established community.	NI	NI	NI	LS	LS
LU-2: Construction of proposed DWSP facilities could reduce access to, or interfere with the use of existing recreational facilities.	LSM	LSM	LSM	NI	LSM
LU-3: Construction of DWSP facilities could conflict with existing agricultural uses.	LS	LS	LS	LS	LS
LU-4: The proposed DWSP could conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.	LS	LS	LS	LS	LS
LU-5: Construction of DWSP WTP and raw water pipeline appurtenant facilities would convert economically viable prime farmland and farmland of statewide importance to non-agricultural use.	NI	NI	SU	SU	NI
LU-6: The proposed DWSP could conflict with existing zoning for agricultural use, or a Williamson Act contract.	LS	LS	LS	LS	LS
LU-7: The proposed DWSP could involve other changes in the existing environment that, due to its location or nature, could individually or cumulatively result in loss of economically viable farmland.	LS	LS	LS	LS	LS

TABLE 3.2-1 (Continued)
SUMMARY OF IMPACTS – LAND USE, RECREATION, AND AESTHETIC RESOURCES

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
LU-8: The proposed DWSP could indirectly: (a) increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility could occur or be accelerated; or (b) include recreational facilities or require the construction or expansion of recreational facilities which could have an adverse physical effect on the environment.	NI	NI	NI	NI	NI
LU-9: Operation of the DWSP intake could reduce access to, or interfere with the use of existing recreational facilities.	LSM	LSM	NI	NI	NI
LU-10: The DWSP intake and WTP would have a substantial adverse effect on scenic vistas, substantially damage scenic resources, or substantially degrade the existing visual character or quality of the site and its surroundings.	SU	SU	NI	LS	NI
LU-11: The DWSP intake and WTP would create a new source of substantial light or glare that would adversely affect nighttime views in the area.	SU	SU	NI	SU	NI

SU = Significant Unavoidable Impact
LSM = Less than Significant Impact with Mitigation
LS = Less than Significant Impact
NI = No Impact

IMPACT STATEMENTS AND MITIGATION MEASURES

Impact LU-1: Construction of proposed DWSP could physically divide an established community. Less than significant for the WTP and treated water pipelines. No impact for the intake facility and raw water pipelines.

Intake Facility

The proposed intake site is not within an existing community, but within an open space/agricultural area. The only existing residences are located on the adjacent Delta islands, which would not be separated from any adjoining development or necessary services. There would be no impact for either the in-bank or the in-river intake facilities.

Raw Water Pipelines

The proposed raw water pipelines would be constructed on the landside of the Empire Tract levee from the proposed intake site to Eight Mile Road. The pipelines would tunnel under Eight Mile Road and continue east on the north side of Eight Mile Road to Pixley Slough. The pipelines would then turn northeast and parallel Pixley Slough to Lower Sacramento Road, and then would parallel Lower Sacramento Road to the WTP site. The raw water pipelines would be located below grade. At water crossings, the pipelines would tunnel under the waterway and would not interfere with transportation or access across the waterways. Therefore, there would be no impact.

Water Treatment Plant

The proposed WTP site is located in an agricultural area. Existing urban development is south of Eight Mile Road. One residence is located to the east of the site, and two residences and a church are located to the south of the site. The WTP would not separate these land uses from either the Lower Sacramento Road or the City. Therefore, the impact would be less than significant.

Treated Water Pipelines

The proposed treated water pipelines would be located within or adjacent to existing road right-of-way, below grade. Construction of the treated water pipelines would extend into the Stockton city limits. The proposed pipelines may temporarily disrupt traffic along surface streets during periods of construction. However, these streets are along the edges of existing development, and access would still be provided along affected routes. The impact would be less than significant.

Mitigation: No mitigation is required.

Impact LU-2: Construction of proposed DWSP facilities could reduce access to, or interfere with the use of existing recreational facilities. Less than significant with mitigation for the intake facility and raw and treated water pipelines. No impact for the WTP.

Intake Facility

The proposed intake site would be located in a recreational area, used by fisherman, boaters, and possibly other recreational users. Construction of the intake facility would limit access to the shoreline at the end of Empire Tract Road. The construction site and mobilization area would block walking access on the levee past the intake site. Due to the width of the waterway at the intake site, boaters would still be able to travel through Little Connection Slough to the San Joaquin River and Disappointment Slough. This disruption would be temporary in nature, and would affect only a portion of Empire Tract. Therefore, with the implementation of Mitigation Measure LU-2, this impact would be less than significant.

Raw Water Pipelines

Recreational facilities along the proposed pipeline alignment include: H & H Marina, King Island Resort, the Reserve at Spanos Park, Oak Grove Regional Park, and Elkhorn Country Club. H & H Marina and the Reserve at Spanos Park are more likely to be affected, as they are on the north side of Eight Mile Road, where the raw water pipeline construction would occur. Access to the facilities on the south side of Eight Mile Road would also be disrupted at some point, although construction and staging would occur on the opposite side of the road from these facilities. Placement of the pipeline is expected to occur at a rate of 100 feet per day (in developed areas) to 400 feet per day (in unconstrained open areas). Therefore, it is unlikely that more than one facility would be affected at one time. Temporary closure of these facilities, particularly a marina, which provides boating access to the Delta, would be considered a potentially significant impact. However, with the implementation of Mitigation Measure LU-2, this impact would be less than significant.

Water Treatment Plant

The proposed WTP would not be located near a recreational facility. Therefore, there would be no impact.

Treated Water Pipelines

Construction of the treated water pipeline in Davis Road would potentially affect access to Elkhorn Country Club. However, there are several alternative access points to this recreational facility. Therefore, with the implementation of Mitigation Measure LU-2, this impact would be less than significant.

Mitigation Measure LU-2: During intake and pipeline construction, alternative access shall be maintained to all recreational facilities identified in Impact LU-2.

Significance After Mitigation: Less than significant.

Impact LU-3: Construction of DWSP facilities could conflict with existing agricultural uses. Less than significant for all DWSP facilities.

Intake Facility

Construction of the proposed in-river intake facility would involve construction both in the waterway and onshore. Permanent facilities would occupy less than 0.5 acre, and would not be located on agricultural land. Additional construction and staging areas would be located on the landside of the levee. The 386-acre parcel adjacent to the levee is prime agricultural land and subject to a Williamson Act contract. However, the construction and staging areas would be temporary in nature, and would not extend into the actively farmed area. The potential effects on surrounding agricultural operations due to construction activities, such as erosion, contaminated runoff, and dust are discussed in Sections 3.4, Drainage and Floodplain Management and 3.6, Air Quality. Therefore, the impact would be less than significant.

Construction of the proposed in-bank intake facility would require less construction in the waterway and a correspondingly larger construction and staging area on land. Permanent facilities would occupy less than one acre, and would not be located on agricultural land. Additional construction and staging areas would be located on the landside of the levee. The 386-acre parcel adjacent to the levee is prime agricultural land and subject to a Williamson Act contract. However, the construction and staging areas would be temporary in nature, and would not extend into the actively farmed area. The potential effects on surrounding agricultural operations due to construction activities, such as erosion, contaminated runoff, and dust are discussed in Sections 3.4, Drainage and Floodplain Management, and 3.6, Air Quality. The impact would be less than significant.

Raw Water Pipelines

The proposed raw water pipelines would be constructed on the landside of the Empire Tract levee from the intake site to Eight Mile Road. The pipelines would tunnel under Eight Mile Road and continue east on the north side of Eight Mile Road to Pixley Slough. The pipelines would then turn northeast and parallel Pixley Slough to Lower Sacramento Road, and then would parallel Lower Sacramento Road north to the WTP site. Construction would be confined to an 80-foot construction easement. Construction would most likely encroach onto agricultural lands north of Eight Mile Road and along Pixley Slough. In open areas with few constraints, pipe installation would occur at a rate of up to 350 feet per day.

The disruption caused by placement of the raw water pipelines would be temporary and affect a small portion of these agricultural parcels, which would be restored subsequent to construction. The potential effects on surrounding agricultural operations due to construction activities, such as erosion, contaminated runoff, and dust are discussed in Sections 3.4, Drainage and Floodplain Management, and 3.6, Air Quality. Therefore, the impact would be less than significant.

Water Treatment Plant

Construction of the proposed WTP would occur on 56 acres of the 126-acre parcel. A portion of the remaining 70 acres would be required for staging areas and access to the WTP site. Therefore, construction would temporarily disrupt the agricultural use of most of this parcel. Following construction, the 70 acres not used for the facility would be restored to agricultural use. The permanent loss of the 56-acre site is discussed below under operational impacts. The potential effects on surrounding agricultural operations due to construction activities, such as erosion, contaminated runoff, and dust are discussed in Sections 3.4, Drainage and Floodplain Management, and 3.6, Air Quality. Therefore, this impact would be temporary and would be less than significant.

Treated Water Pipelines

The treated water pipelines would be constructed within, or adjacent to the road right-of-way. Construction would be confined to a 60-foot construction easement. The construction activity along Eight Mile Road and Lower Sacramento Road may encroach onto an agricultural operation. However, this temporary disruption would affect a very small portion of these agricultural parcels, which would be restored subsequent to construction. In open areas with few constraints, pipe installation would occur at a rate of up to 400 feet per day. The potential effects on surrounding agricultural operations due to construction activities, such as erosion, contaminated runoff, and dust are discussed in Sections 3.4, Drainage and Floodplain Management, and 3.6, Air Quality. Therefore, this impact would be temporary and would be less than significant.

Mitigation: No mitigation is required.

Impact LU-4: The proposed DWSP could conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. Less than significant for all DWSP facilities.

The proposed DWSP would be consistent with the Stockton General Plan, and implement the following General Plan policy:

> Pursue as the City's first priority for water resources the development and acquisition of supplemental surface water sources in order to reduce the overdraft of groundwater supplies, including participation in financing conveyance facilities.

The proposed DWSP includes all feasible mitigation in its design, consistent with the following City General Plan policy:

> Assure that public facilities are compatible with surrounding land use and are an asset to the area.

The proposed DWSP lies mainly within unincorporated San Joaquin County. County land use plans and regulations include the San Joaquin County General Plan 2010, the County Development Code, and the County Right to Farm Ordinance. However, projects on City controlled property are not subject to the land use regulations of the County. Additionally, the County would not require permits or make a finding as to general plan consistency for City-owned projects (Jolley, 2004). Nevertheless, these plans and regulations have been identified in the Regulatory Setting section. The proposed DWSP would incorporate feasible mitigation measures in order to protect sensitive natural resources in the Delta, consistent with the County General Plan 2010. As discussed below, the design of the proposed DWSP would minimize disruption to agricultural operations. The location and construction of pipelines would be consistent with the County's policy that utility lines not adversely impact significant plant and animal species or interfere with agricultural operations.

The Delta Management Plan applies to the proposed intake site and a portion of the raw water pipeline alignment. The proposed DWSP would be consistent with the Management Plan policy that impacts associated with utilities be mitigated by locating new construction in existing utility or transportation corridors, or along property lines, and by minimizing construction impacts.

Consistency with the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) is discussed in Impact BIO-6, in Section 3.5, Biological Resources.

The proposed DWSP would not conflict or prevent the implementation of any of the applicable land use plans. In addition, the proposed DWSP would implement a portion of the City General Plan. Therefore, the impact would be less than significant.

Mitigation: No mitigation is required.

Impact LU-5: Construction of the DWSP WTP and the raw water pipeline appurtenant facilities would convert economically viable prime farmland and farmland of statewide importance to non-agricultural use. Significant and unavoidable for the WTP and raw water pipelines. No impact for intake facility and treated water pipelines.

The FMMP classifies the 126-acre parcel containing the proposed WTP site as important farmland (CDOC, 2002). Fifty-six acres of the property would be required for the facility, while the remaining 70 acres would be used as an agricultural buffer. The 56 acres to be converted to non-agricultural use include six acres of Prime Farmland and 50 acres of Farmland of Statewide Importance. In addition, installation of raw water pipeline appurtenant facilities would convert 0.2 acre of important farmland to non-agricultural use. Using the LESA model, the conversion of the 56.02 acres results in a score of 66, with a score of 60 normally indicating significance (Appendix B). Therefore, this would be a significant impact.

Mitigation, as defined by CEQA Guidelines §15370, includes: (a) avoiding the impact; (b) minimizing the impact; (c) rectifying the impact through restoration, (d) reducing the impact through preservation and maintenance; or (e) compensating for the impact through the replacement or substitution. Avoidance would require relocation of the proposed WTP facility and the raw water pipeline alignment. This form of mitigation is infeasible, as there are no undeveloped parcels of suitable size in the area that do not contain important farmland (Figure 3.2-2). The location of the WTP and raw water pipelines north of the City was based on the operational requirements of the DWSP.

Minimizing the impact would require reducing the footprint of the DWSP facilities with a corresponding reduction in important farmland converted. The DWSP facilities, including the proposed intake facility and pipeline alignments, have been designed to minimize or avoid conversion of both farmland and sensitive habitat. The WTP facility would occupy 56 acres of a 126 acre parcel. While this preserves 70 acres of important farmland, the conversion of 56 acres remains a significant impact.

Restoration of farmland would occur on any land impacted by construction activity (refer to the discussion for Impact LU-3, above). However, for the WTP and raw water pipeline appurtenant facilities, which would be permanent, restoration of farmland would not be possible.

Reducing the impact through preservation and maintenance would be similar to the minimization approach. Preservation and maintenance of the remaining 70 acres at the WTP site would be possible on at least an interim basis. Eventually the surrounding parcels most likely would be developed, and commercial farming of an isolated 70-acre parcel would not be economically feasible. Mitigation Measure LU-5a describes the preservation of the 70-acre parcel.

Compensation involves obtaining replacement resources for those that are lost. This form of mitigation is commonly associated with replacement requirements for loss of wetlands or vegetation. Acquisition of agricultural conservation easements (ACE) is considered by some as a mitigation measure for converted farmland. Acquisition of an ACE generally involves purchasing the development rights for farmland of the same quantity and quality as the land being converted by the proposed project.[4] The ACE is a tool for regional conservation of important farmland that reduces the total amount of farmland that is available for future urban use. As such, ACEs provide mitigation at the cumulative level, by limiting future farmland conversion.

However, off-site conservation easements over existing farmland would not provide full project-level mitigation, because they would not compensate for the loss or farmland due to the DWSP or

4 An ACE is more closely tied to the resource affected—important farmland—than a broader open space mitigation plan, such as the SJMSCP.

replace the resources lost because they would not reduce the overall net loss of farmland by the WSP. [5] Therefore, the direct impact of the DWSP on farmland would be significant unavoidable.

Mitigation Measure LU-5a: The 70-acres of farmland at the WTP site, not required for the WTP facility, shall remain available for farming operations for as long as is economically and environmentally feasible.

Mitigation Measure LU-5b: If the City adopts an agricultural land conversion mitigation policy prior to 2010, the City shall pay into a "farmland trust" fund for San Joaquin County that will acquire ACEs to compensate for the conversion of important farmland at the WTP site and along the raw water pipeline alignment. The farmland subject to the easements shall be of the same acreage, and at least the same category of farmland, as identified by the latest FMMP report, as that farmland affected at the WTP and along the raw water pipeline alignment.

Significance After Mitigation: Significant unavoidable.

Impact LU-6: The proposed DWSP could conflict with existing zoning for agricultural use, or a Williamson Act contract. Less than significant for all DWSP facilities.

Intake Facility

The in-river intake facility would require approximately one acre of land for onshore facilities, including the surge protection facilities and the support building. The parcel adjacent to the levee is zoned AG-40 (general agriculture) and subject to a Williamson Act contract. Although placement of the intake facility may require acquisition of small portion of the adjacent property, this acquisition would not extend into the land currently used for agricultural purposes. The operation of the intake facility would not substantially affect the remaining contract lands. Therefore, this impact would be less than significant.

The in-bank intake facility would require a larger footprint for onshore facilities. Placement of the intake facility may require acquisition of small portion of the adjacent property. However, this acquisition would not extend into the land currently used for agricultural purposes and would not substantially affect the remaining contract lands. Therefore, this impact would be less than significant.

Raw and Treated Water Pipelines

The raw water pipeline alignment would be adjacent to existing roadways within areas zoned and used for agriculture. The treated water pipelines would be primarily located within existing road

[5] The limitations of conservation easements to mitigate the direct impacts of farmland conversion is discussed in several unpublished court decisions: *Friends of the Kangaroo Rat v. California Dept. of Corrections*, (Fifth District Court of Appeal, Aug. 18, 2003); *County of Santa Cruz v. City of San Jose* (Sixth District Court of Appeal, March 27, 2003); and *South County Citizens v City of Elk Grove* (Third District Court of Appeal, February 5, 2004).

right-of-ways, although construction areas may extend into adjacent lands used for agriculture. Some of these properties are also subject to Williamson Act contracts (Figure 3.2-2). Williamson Act contracts are not affected by the acquisition of either (1) temporary construction easements for public utility improvements, or (2) an interest in real property for underground public utility improvements, provided that the surface of the land subject to the acquisition is returned to pre-construction conditions, and that the construction of the public utility improvement would not significantly impair agricultural use of the contracted parcel (Government Code §51293). It is anticipated that only a temporary 80-foot construction easement would be necessary. After pipeline construction, the property would be returned to its pre-project condition and agricultural activities would resume. Therefore, this impact would be less than significant.

Water Treatment Plant

The proposed WTP site, currently zoned AG-40 (general agricultural) by the County, is subject to a Williamson Act contract. Under the San Joaquin County Development Code, the proposed WTP would be classified as a public facility; public facilities are not limited to a specific zone. Therefore, zoning consistency would be based on the San Joaquin County General Plan's General Agriculture land use category, which the AG-40 zone implements. Non-farm uses are allowed on General Agricultural lands (1) if required by operational characteristics, (2) if it will not have a detrimental effect on the management or use of surrounding agricultural properties, or (3) will be sited to minimize any disruption to the surrounding agricultural operations (San Joaquin County, 1992). The location and operational characteristics of the WTP would not have a detrimental effect or place any limitations on the agricultural operations adjacent to the WTP site.

Public acquisition of Williamson Act lands normally results in termination of the contract following a consultation process with the County administrating body and the CDOC. Public acquisition of contracted lands must meet two criteria (Government Code §51293).

1. The location is not based primarily on a consideration of the lower cost of acquiring land in an agricultural preserve.
2. If the land is agricultural land covered under a contract pursuant to this chapter for any public improvement, and that there is no other land within or outside the preserve on which it is reasonably feasible to locate the public improvement.

The location of the proposed WTP is based on operational needs. No suitable alternative location that is not subject to a Williamson Act contract exists in the area. All suitable parcels in the area are classified as important farmland and/or subject to a Williamson Act contract. In addition, agricultural operations would continue in the remainder of the 126-acres (i.e., 70 acres) not used for the WTP. This would favorably affect the continued operation of adjoining agricultural uses, and preserve agricultural use on the majority of the 126-acre parcel. Therefore, this impact would be less than significant.

Mitigation: No mitigation is required.

Impact LU-7: The proposed DWSP could involve other changes in the existing environment that, due to its location or nature, could individually or cumulatively result in loss of economically viable farmland. Less than significant for all DWSP facilities.

This impact discussion is limited to the construction and operation of the facilities. The potential loss of farmland due to growth-inducing effects of the proposed DWSP is discussed in Chapter 6, Growth Inducement Potential and Secondary Effects of Growth.

Potential conflict with adjacent farmland due to construction or operation effects is discussed in Impacts LU-3, LU-5, and LU-6. As discussed in this chapter, nuisance effects, which would cause the loss of economically viable farmland, would not occur. Conversion of farmland would be limited to the land requirements of the facilities, as discussed in Impact LU-5.

Mitigation: No mitigation is required.

Impact LU-8: The proposed DWSP could indirectly: (a) increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility could occur or be accelerated; or (b) include recreational facilities or require the construction or expansion of recreational facilities which could have an adverse physical effect on the environment. No impact for all DWSP facilities.

The proposed DWSP does not include residential development that would increase the demand for recreational facilities. The DWSP would not substantially increase the daytime population that would potentially use existing recreational facilities. The proposed DWSP does not include the construction or expansion of recreational facilities. Therefore, there would be no impact.

Mitigation: No mitigation is required.

Impact LU-9: Operation of the DWSP intake could reduce access to, or interfere with the use of existing recreational facilities. Less than significant with mitigation for the intake facility. No impact for raw and treated water pipelines and WTP.

The proposed intake facility would extend across the existing levee road. Currently, public access for vehicles is blocked at the end of Empire Tract Road where the intake facility would be located. However, fishermen and hikers can continue walking east on the levee road to Disappointment Slough. Construction and operation of the intake facility would potentially block this access, resulting in a significant recreational impact. With mitigation, the impact would be less than significant.

Mitigation Measure LU-9: The design of the intake facility shall provide for continued public access to the San Joaquin River and Disappointment Slough. Pedestrian access shall be designed to discourage trespassing on adjacent properties.

Significance After Mitigation: Less than significant.

Impact LU-10: The DWSP intake and WTP would have a substantial adverse effect on scenic vistas, substantially damage scenic resources, or substantially degrade the existing visual character or quality of the site and its surroundings. Significant unavoidable for the intake facility. Less than significant for the WTP. No impact for raw and treated water pipelines.

No designated scenic vistas occur within the project area. However, the Delta is considered an important scenic resource. No state scenic highways occur within the project area. Three county scenic routes occur within the project area: Empire Tract Road, Eight Mile Road west of Thornton Road, and I-5.

Intake Facility

The natural character of the views from Empire Tract Road is somewhat degraded by the presence of a marina, residential dwellings, discarded rip-rap and other refuse, rip-rap along the shoreline, dilapidated boat ramps, and pole-mounted utilities. Nevertheless, the views of Little Connection Slough, the San Joaquin River, and the Delta islands (particularly King, Ward, and Tinsley Islands) are a significant visual resource within this scenic route.

The proposed in-river intake facility would represent a substantial new structure visible from the southern end of Empire Tract Road. The in-river intake facility would be 35 feet tall from the top of the existing levee and would include an access bridge from the levee (Figures 2-11a and 2-12a). The proposed facility would represent a new structure in an area that is primarily open space and agricultural in character and reduces the intactness of the Delta views. The potential viewers of the intake facility include residents on the nearby islands, recreational users of the Delta (fishermen, boaters, etc.), and agricultural workers. As discussed in the Setting, two of these viewer groups, residents and fishermen, are considered to be sensitive groups with high exposure time. Therefore, even with mitigation, this would be a significant unavoidable impact.

The proposed in-bank intake facility would represent a new structure in an area which is primarily open space and agricultural in character and reduce the intactness of the Delta views. The in-bank facility would consist of a cast-in place concrete structure in the shore of the San Joaquin River. The grade level for the electrical control building and pump facilities would be ten feet above mean water level (Figures 2-11b and 2-12b). Even with mitigation, this would be a significant unavoidable impact.

Water Treatment Plant

The WTP would cover 56 acres of a 126-acre agricultural property. The property includes one residential structure, which would be removed. The WTP facility would be located along the western perimeter of the site, which is the farthest possible distance (1,000+ feet) from Lower Sacramento Road and the nearest residences. Trees will be planted along the perimeter of the site to screen the WTP from public view. The WTP facilities will be set back 100 feet from the perimeter. An eight-foot tall fence with victory arms will surround the WTP. Native and/or xeriscape plants will be used to landscape within the site. Therefore, this impact would be less than significant.

Mitigation Measure LU-10: The design of the intake facility and WTP, including the choice of color and materials, shall seek to reduce the visual impact of the facility. Bright reflective materials and colors shall be avoided.

Significance After Mitigation: Significant unavoidable for intake facility.

Impact LU-11: The DWSP intake and WTP would create a new source of substantial light or glare that would adversely affect nighttime views in the area. Significant unavoidable for the intake facility and WTP. No impact for raw and treated water pipelines.

Intake Facility

The intake facility would have nighttime lighting for navigational safety and security. The lighting would introduce a substantial source of light in a primarily natural (unlit) setting. The lighting would be visible from residential receptors in the Delta islands. Therefore, this would be a significant unavoidable impact.

Water Treatment Plant

The WTP would have nighttime lighting for safety and security. The lighting would introduce a new source of light in a primarily agricultural area. Therefore, this would be a significant unavoidable impact.

Mitigation Measure LU-11: Outdoor light sources shall be properly shielded and installed to prevent light trespass on adjacent properties. Any flood or spot lamps installed for purposes other than waterway navigation must be aimed no higher than 45 degrees above straight down (half-way between straight down and straight to the side) when the source is visible from any off-site residential property or public roadway.

Significance After Mitigation: Significant unavoidable.

3.2.3 REFERENCES

California Department of Food and Agriculture (CDFA). 2002. California Agricultural Resource Directory.

California Department of Conservation (CDOC). 1997. California Agricultural Land Evaluation and Site Assessment Model. 1997.

California Department of Conservation (CDOC). 2002. Farmland Mapping and Monitoring Program. Farmland Conversion Report 1998 – 2000.

California Department of Transportation (Caltrans). 2004. California Scenic Highway Mapping System. Available at http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm.

City of Stockton. 1990. City of Stockton General Plan: Policy Document. Adopted January 22, 1990; last amended November 3, 1998.

City of Stockton. 2004a. City of Stockton General Plan Housing Element. Adopted January 13, 2004.

City of Stockton. 2004b. City of Stockton General Plan Background Report.

Delta Protection Commission. 2002. Land Use and Resource Management Plan for the Primary Zone of the Delta. Adopted Feb. 23 1995; reprinted May 2002.

Federal Highway Administration Office of Environmental Policy (FHWA). 1981. Visual Impact Assessment for Highway Projects. Publication Number: FHWA-HI-88-054.

Jolley, J. 2004. Personal communication with Jennifer Jolley, San Joaquin County Community Development Department. June 10, 2004.

San Joaquin County. 1992. San Joaquin County General Plan 2010. Adopted July 29, 1992.

San Joaquin County. 1997. San Joaquin County Code, Title IX.

United States Department of Agriculture (USDA). 1992. Soil Conservation Service. Soil Survey of San Joaquin County, California.

3.3 GEOLOGY, SOILS, AND SEISMICITY

This section provides an overview of the geologic setting for the project area with a discussion of existing site conditions and topography, regional geology, soils and subsurface lithology, regional faults, and associated seismic probabilities. Potential geologic and seismic hazards that may affect the project area are outlined along with pertinent regulatory information. Finally, an assessment of impacts that could result from construction and operation of the DWSP and appropriate mitigation measures are discussed.

3.3.1 SETTING

ENVIRONMENTAL SETTING

Topography

San Joaquin County is located in the central portion of the Great Valley geomorphic province of California. This geomorphic province is characterized as a northwestward-trending trough that formed between the Coast Range Mountains to the west and the Sierra Nevada Mountains to the east. The Great Valley is about 50 miles wide and extends for 400 miles through the center of California. 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 topography of the Great Valley is relatively level, with elevations ranging from a few feet to a few hundred feet above msl.

The COSMA is situated in west-central San Joaquin County, at the northern end of the San Joaquin Valley. The project area extends from the flat alluvial plains[1] just north of the City to the western reach of the Stockton Deep Water Ship Channel; located near the western boundary of San Joaquin County. The surrounding geomorphology is characteristic of a highly dissected alluvial plain with numerous river systems converging in the vicinity of the project area. These waterways are discussed in detail in Chapter 4, Delta Water Resources and Fisheries.

Surface elevations at the proposed WTP site are approximately 20 feet above msl (USGS, 1968). Topography in this region is relatively flat, and slopes decrease gradually to the west towards the Delta Islands where surface elevations range between five and 15 feet below msl (USGS, 1978). Surface elevations on Empire Tract range between 10 and 15 feet below msl in the vicinity of the proposed intake site with the perimeter levee rising 20 to 30 feet above the adjacent land surface. Slopes on the land side of the levee range from less than 10 percent to 30 percent. Other levees within the project area include those constructed on the eastern side of Empire Tract, King Island, and western Bishop Tract.

1 A region periodically inundated by flooding, where flowing water washes away and transports earth, sand, gravel, and other material, and deposits it elsewhere.

Geology

The Central Valley formed as a consequence of the accumulation of sediments that eroded from the Sierra Nevada Mountains 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 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.

The project area is generally underlain by Quaternary-aged sedimentary rocks (Wagner et al., 1981). Upper (and thus younger) portions of the Modesto Formation underlie the proposed WTP site and the areas east of I-5. The Modesto Formation is an alluvial fan deposit that generally ranges in thickness from 150 to 200 feet, and consists of discontinuous clay and silt lenses, interbedded with fine and coarse sand deposits derived from the Sierra Nevada. A subsurface investigation indicated that the WTP site is underlain by layers of silty-sands at the surface with silty-clays, sandy clays and medium to dense sands to a depth of a 100 feet below the ground surface (bgs) (AGS, Inc., 2005). This lithology generally characterizes portions of the raw water pipeline alignment from west of I-5 to the WTP site.

A combination of the lower (and thus older) Modesto Formation and Holocene-aged (up to 10,000 years ago) inter-tidal deposits underlie sections of the pipeline alignment west of I-5, Bishop Tract, King Island, and eastern sections of Empire Tract (Wagner et al., 1981). Soils borings for this section of the pipeline encountered a soft to medium-stiff layer of peat that ranges from seven to over 23 feet in depth and increased in thickness towards the west (AGS, Inc., 2005). This layer is readily identified and overlain by fill materials (e.g., sandy clays, gravels) in soil borings taken in sections of Bishops Tract and Empire Tract.

Subsurface conditions below the proposed in-bank intake structure are characterized by a layer of fill material, approximately five feet in depth, underlain by a soft to medium-stiff peat extending to depth of 27 to 35 feet bgs. Below the layer of peat are layers of medium dense to dense silty and clayey sands, and stiff to hard sandy, silty clays, and sandy silts to a depth of 100 feet bgs (AGS, Inc., 2005). Subsurface conditions conducted at three offshore locations encountered layers of medium, dense and silty-sands, and stiff to hard clays and silty clays to depths of 104 feet below the water surface.

Soils

In general, soil resources within the project area are characterized by deep, poorly drained, fine-grained materials that may contain a high percentage of organic materials that are formed in floodplains (NRCS, 1992). Distinct soils groups in San Joaquin County are classified within six general landscape classes as defined by the National Resources Conservation Service (NRCS) (1992). Each landscape class includes soil groups comprised of specific soil types with similar characteristics. Two of the six San Joaquin County general landscape classes and associated soil groups are present within the project area and are described as follows.

> **Basin and Basin Rim Soils.** Basin and Basin Rim Soils are found in areas east of I-5 along Bear Creek and Pixley Slough and extend to the eastern portion of Bishop Tract. Development limitations on these soils generally include shallow groundwater, which could impact subsurface structures (e.g., pipelines, sub-grade foundations), low permeability, and high shrink-swell potential.

> **Delta Floodplain Soils.** Delta Floodplain Soils are generally located on King Island, Empire Tract, and the western portion of Bishop Tract. These soils consist of floodplain deposits that have been drained via a large system of levees and canals to allow for cultivated agriculture. Development limitations include a high subsidence potential due to organic decomposition and compaction, high groundwater, wind erosion, and shrink-swell potential.

These soils have been drained through a vast system of levees and dikes to allow for agricultural use, and more recently, other forms of development. In the context of the project area, each soil type may have properties that could present limitations for the construction of the intake facility, pipelines, and concrete foundations. For example, soils west of I-5 are characterized by a seasonally high water table that may encroach to within 24 inches or less of the surface during the winter. Figure 3.4-2 in Section 3.4, Drainage and Floodplain Management shows the water table in the project area. Construction 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[2]; groundwater, gas, and oil extraction; or the decomposition of highly organic soils. Outside of the Delta, subsidence is generally attributed to consistent and long-term overdraft of the groundwater basin. Within the Delta, subsidence can be caused by oxidation, anaerobic decomposition, shrinkage, and wind erosion.

> **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. The soils within the DWSP project area are classified as highly corrosive to concrete and/or steel.

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[2] Hydrocompaction is the process of volume decrease and density increase upon saturation of moisture-deficient deposits.

Table 3.3-1 provides a detailed description of these hazards and indicates which DWSP facilities could be potentially affected by these hazards.

TABLE 3.3-1
SUMMARY OF SOILS-RELATED HAZARDS

Soil Hazard	Description	DWSP Facility
Erosion Potential	Excessive soil erosion can eventually lead to damage of building foundations, roadways, and dam embankments. Increases in erosion may also result in corresponding increases in sediment loads to local waterways, thereby adversely affecting aquatic habitat.	Intake Facility Raw Water Pipelines Treated Water Pipelines WTP
Regional Subsidence	Current estimates for subsidence in the central and western portions of the Delta indicate an average rate of one to three inches per year (USGS, 2000). Because the majority of the Delta islands are below sea level, continued subsidence places additional hydrostatic pressure on existing perimeter levees. For example, the entire Empire Tract island ranges between 10 and 20 feet below sea level, which is directly attributable to the effects of regional subsidence within the Delta.	Raw Water Pipelines Intake Facility
Expansive Soils	Structural damage to concrete slabs, foundations, and other structures may result over an extended period of time, usually the result of inadequate soil and foundation engineering. Typically, soils that exhibit expansive characteristics are found within the upper five feet of the soil profile, though they may occur at greater depth. Expansion and contraction of soils, depending on the season and the amount of surface water infiltration, may exert enough pressure on structures to result in cracking, settlement, and uplift, thereby resulting in damage to foundations, above-ground structures, paved roads and streets, and concrete slabs.	Intake Facility Raw Water Pipelines Treated Water Pipelines WTP
Corrosivity to Uncoated Steel/Concrete	Soils located along lowland areas near the Delta typically have a higher than normal corrosivity due to their relatively high sodium content, which increases the susceptibility of steel and concrete structures to the effects of corrosion. Based on this information, soils encountered in the Delta may be highly corrosive.	Intake Facility Raw Water Pipelines Treated Water Pipelines WTP

SOURCE: NRCS (1992).

Mineral Resources

The California Geological Survey (CGS) classifies the regional significance of mineral resources in accordance with the California Surface Mining and Reclamation Act (SMARA) of 1975. Mineral Resource Zones (MRZ) have been designated to indicate the significance of mineral deposits. The MRZ categories are as follows:

MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence.

MRZ-2: Areas where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.

MRZ-3: Areas containing mineral deposits the significance of which cannot be evaluated from available data.

MRZ-4: Areas where available information is inadequate for assignment to any other MRZ.

Mineral resource extraction in the southwestern portion of San Joaquin County occurs along the Corral Hollow Creek alluvial fan and along major rivers in the eastern portion of the County (San Joaquin County, 1992). No mineral resource extraction areas are identified within the project area under the City or County General Plans. As a result, construction and operation of the DWSP would neither interfere with any existing extraction operations nor reduce the availability of a MRZ-2 classified resource. For these reasons, this issue is not discussed further in this section.

Seismicity

San Joaquin County is situated in an area considered seismically active. The seismicity of the region is primarily related to activity on the San Andreas fault system that forms the boundary between the North American and Pacific crustal plates, and is expressed as a series of northwest-trending faults (Jennings, 1994). According to the 1997 Uniform Building Code (UBC), the entire northern Central Valley region is located within seismic zone 3. Areas to the west, between the Pacific Ocean and the western Delta, are within seismic zone 4 and are at highest risk to experience maximum magnitudes and damage in the event of an earthquake. The boundary between seismic zones 3 and 4 is represented by I-580 in the southwestern corner of San Joaquin County (Darrow, 2004). Areas southwest of this boundary are in seismic zone 4; the remainder of the region is in seismic zone 3. Although both seismic zones 3 and 4 are susceptible to earthquake ground motion and seismic design criteria for both are required under the UBC, minimum requirements for design in seismic zone 4 are typically more rigorous than those required under seismic zone 3.

The maximum (moment) magnitudes (M_w) provided in Table 3.3-2 represent characteristic earthquakes on each of the active and potentially active faults[3] to the west of the project area. Moment magnitude is related to the physical size of a fault rupture and movement across a fault. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting

[3] An “active” fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A “potentially active” fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. The term “sufficiently active” is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (CGS, 1997).

TABLE 3.3-2
ACTIVE FAULT SOURCES WITHIN A 100-MILE RADIUS OF THE PROPOSED DWSP

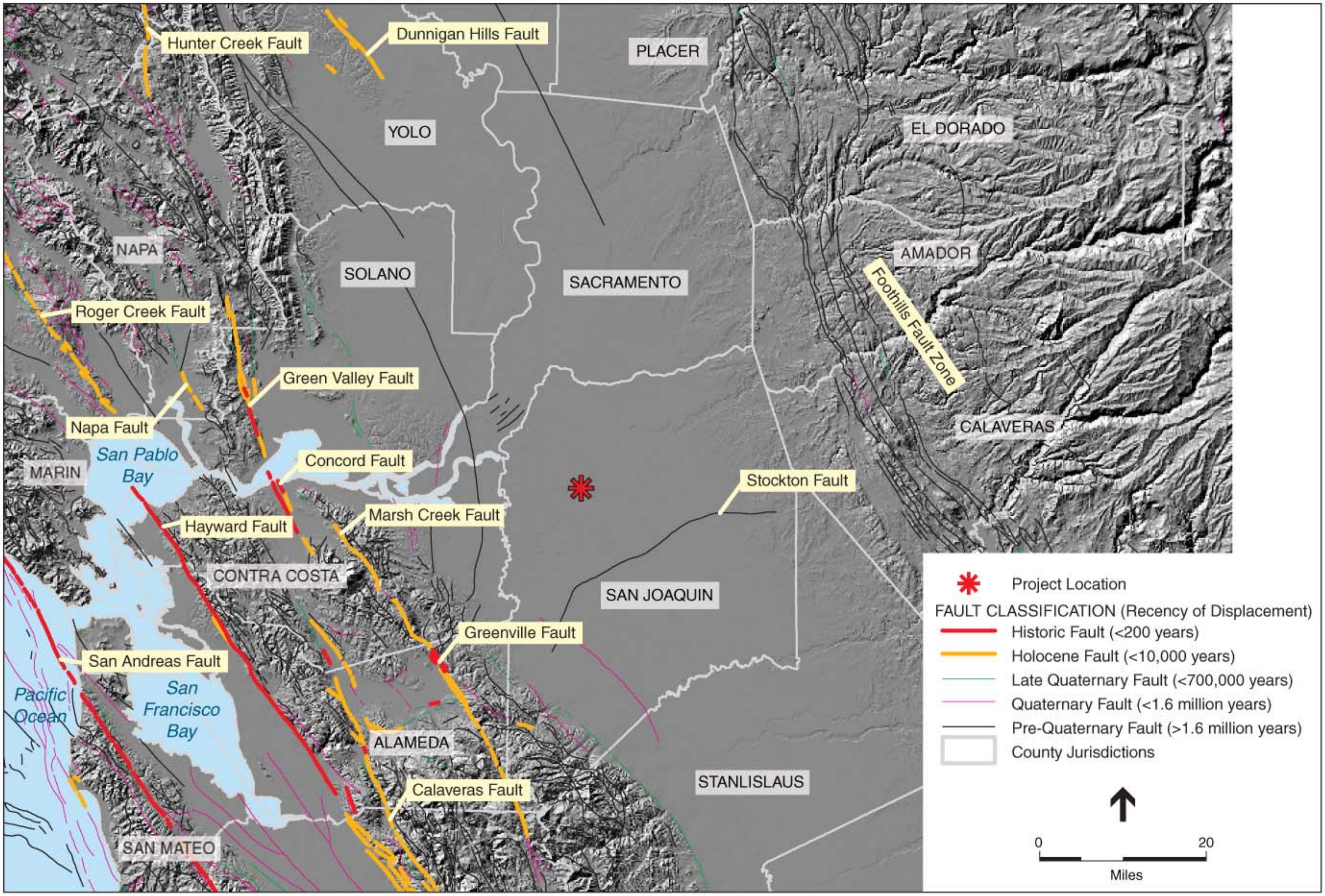
Fault Zone	Location Relative to Stockton	Recency of Faulting[a]	Probable Maximum Moment Magnitude
San Andreas (Peninsula and Golden Gate Segments)	65 miles west	Historic	7.3
Hayward	56 miles west	Historic	6.9
Calaveras	38 miles southwest	Historic	6.8
Concord – Green Valley	36 miles west	Historic	6.9
Dunnigan Hills	58 miles north	Holocene	N/A
Healdsburg – Rodgers Creek	64 miles northwest	Holocene	7.0
Marsh Creek – Greenville	25 miles west-southwest	Historic	6.9
Ortigalita	62 miles south	Holocene	6.9
CRCV (Segments 8–9)	<10 miles west	Holocene[b]	6.0
Cleveland Hills Fault	85 miles north	Historic	N/A
West Napa	47 miles west	Holocene	6.5

a Recency of faulting from Jennings (1994).
b Wakabayashi and Smith (1994).
N/A = Not applicable and/or not available.
SOURCE: Jennings (1994).

event (CGS, 2002). While the magnitude is a measure of the energy released in an earthquake, intensity is a measure of the ground shaking effects at a particular location. Shaking intensity can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material.

Regional Faults

Figure 3.3-1 illustrates the regional proximity of these active and other potentially active faults in relation to the project area. The nearest faults to the project area exhibiting historic displacement (activity within the last 200 years) are the Concord-Green Valley, Hayward, and Marsh Creek-Greenville faults, located approximately 25 to 46 miles west of the project area (Jennings, 1994). Portions of the Calaveras fault zone that are considered active within the last 200 years are located approximately 45 miles west of the project area. Other active faults within 100 miles are the Dunnigan Hills (Zamora) (58 miles north), Ortigalita (62 miles west), Healdsburg-Rodgers Creek (64 miles west), West Napa (47 miles west), and San Andreas (65 miles west) fault zones.



SOURCE: California Geological Survey, 2000; and Environmental Science Associates, 2004

Figure 3.3-1
Regional Fault Locations

A seismically-active, concealed (blind) fold and thrust fault belt situated within the Coast Range-Central Valley (CRCV) Geomorphic Boundary lies less than five miles west of the proposed intake site. Earthquakes associated with this fault system include the 1985 M_w 6.1 Kettleman Hills and the 1983 M_w 6.5 Coalinga events (Wakabayashi and Smith, 1994). The concealed CRCV thrust is thought to have caused the 1892 Vacaville-Winters earthquake, estimated M_w 6.75 intensity (Wakabayashi and Smith, 1994).

Numerous other potentially active faults have been mapped across the western slope of the Sierra Nevada, with most exhibiting evidence of Late-Quaternary or Quaternary displacement. These faults include the north and northwest trending Melones Fault Zone and Bear Mountains Fault Zone, which are collectively referred to as the Foothills Fault system. The closest segment of the Foothills Fault Zone is located 35 miles east of the project area.

Ground Motion

The 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 PGA is based on a 10 percent exceedance in 50 years within western sections of the project area could range between 0.40 to 0.50 g (4/10 to 5/10 the acceleration of gravity) (Peterson et al., 1996). PGA values of this intensity could lead to considerable damage to specially designed structures, partial collapse of ordinary structures, shifting of building foundations, and underground pipe breakage.

Potential ground motions were computed based on the maximum creditable earthquake (MCE) for various faults capable of significant ground motion within the project area (AGS, Inc., 2005). The MCE for the Midland fault zone would be a magnitude 6.0 event; while the MCE for the Concord-Green Valley and Hayward Faults would range from a magnitude 7.0 to 7.5 event. Based on these MCE values, a PGA value of 0.15 g for the project area was computed based on the deep alluvial stratigraphy (AGS Inc., 2005). This estimate differs from both the CGS's published estimates and the UBC value of 0.36 g for the Stockton area.

Geologic Hazards

Surface Fault Rupture

Fault rupture is displacement at Earth's surface resulting from fault movement associated with an earthquake. Surface expression of fault rupture is typically observed and is expected on or within close proximity to the causative fault. The Marsh Creek-Greenville fault is the closest active fault zoned under the Alquist-Priolo Earthquake Fault Zoning Act to the project area. This fault is situated over 25 miles west of the project area. As a result, the project area is neither located within, nor crosses, a delineated Alquist-Priolo Earthquake Fault Zone. Therefore, the risk of surface fault rupture within the project area is considered low and is not discussed further in this section (CGS, 1997).

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 due to the effects of liquefaction are typified by a high groundwater table and underlying loose to medium-dense, granular sediments, particularly younger alluvium and artificial fill. Clayey type soils are generally not subject to liquefaction.

Hazard maps produced by the Association of Bay Area Governments (ABAG) depict liquefaction and lateral spreading hazards for the entire Bay Area and western sections of Delta in the event of a significant seismic event (USGS, 2000). A review of the maps indicates that western sections of the Delta are expected to have a moderate to very high potential to experience liquefaction. Because Empire Tract is located less than 0.5 mile east of these locations, it is reasonable to infer that western sections of the project area have, at minimum, a moderate potential to experience liquefaction in the event of significant ground motion. For this reason, this issue is discussed further in Impacts and Mitigation Measures in this section.

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, and slope wash, and areas with improperly engineered construction fills are susceptible to this type of settlement. Given the extensive land manipulation that has occurred within various portions of the project area and observed lithology, this issue may affect construction of the intake facility and is discussed further in Impact Statements and Mitigation Measures in this section.

Landslides

Levees are the dominant topographic features within the 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 native 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 project area is generally level with the exception of several levee crossings, hazards associated with landslides are generally limited to minor slope movements along the levee. This issue is discussed further in the Impact Statements and Mitigation Measures in this section.

Earthquake-Induced Inundation

Earthquakes can cause tsunami ("tidal waves"), seiches (oscillating waves in enclosed water bodies), and landslide splash waves in enclosed water bodies such as lakes, reservoirs, and the large channels. Earthquakes can also result in dam failures at reservoirs. Tsunami and seiches are not considered to be a significant threat to the project area. Because western portions of the project area are located within the Delta, if one of the nearby faults were to experience substantial movement, a seiche could be produced, which could potentially damage near-by levees. However, given the proposed intake facility's location within the Delta, any seiche would be minimized by the islands to the west. Additionally, because the Empire Tract levee is maintained by the Corps, the integrity of the levee is considered sufficient to withstand the effects of a minor seiche, which would be similar to a wake currently generated by large marine vessels. For this reason, this issue is not discussed further in this section.

Volcanic Hazards

The project area is located approximately 165 miles from Lassen Peak and approximately 100 miles from Mono Lake/Long Valley volcanic areas. Therefore, the risk to the project area from volcanic hazards is extremely low. For this reason, this issue is not discussed further in this section.

REGULATORY SETTING

State

Alquist-Priolo Geologic Hazards Zone Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces.[4] Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement. The project area is neither located within nor crosses a delineated Alquist-Priolo Earthquake Fault Zone (CGS, 1997).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This 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 project design. To date, a Seismic Hazard Map for the project area has not been produced.

California Uniform Building Code

The California Building Standards Code is another name for the body of regulations known as the California Code of Regulations (CCR), Title 24. Title 24, Part 2 is the California Building Code (CBC). Title 24 is assigned to 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.

Published by the International Conference of Building Officials (ICBO), the UBC is a widely adopted model building code in the United States. The CBC incorporates by reference the UBC with necessary California amendments. About one-third of the text within the CBC has been tailored for California earthquake conditions. Additionally, the American Water Works Association (AWWA) has established probabilistic design criteria for peak ground accelerations associated with maximum creditable earthquake for water and wastewater facilities.

California Department of Transportation

The California Department of Transportation (Caltrans) has developed roadway design standards including those for seismic safety. Considerations of earthquake hazards in roadway design are detailed in the Highway Design Manual published by Caltrans (2001). Modifications to local highways and roads would be required to adhere to Caltrans engineering standards to minimize settlement.

[4] A “structure for human occupancy” is defined by the Alquist-Priolo Act as any structure used or intended for supporting or sheltering any use or occupancy that has an occupancy rate of more than 2,000 person-hours per year.

Local

City of Stockton General Plan Safety Element

The City of Stockton General Plan Policy Document, Safety Element, includes a number of policies related to seismic and other geologic hazards. These policies are presented below:

Section 6, Safety
Safety Goals and Polices

General Safety Issues

Goal 1 Protect the Community from injury and damage resulting from natural catastrophes and hazardous conditions.

Policies

3. Continue to update the building, fire and other codes to address earthquakes, fire and other hazards.

4. Promote awareness and caution among residents regarding possible natural hazards, including soil conditions, earthquakes, flooding and fire hazards.

Seismic and Other Geologic Hazards
Goal 1 Protect the Community from the hazards of expansive soils, seismic dangers and other geologic activity.

Policies

1. The safety of people shall take precedence over the protection of property.

2. Structures utilized by large numbers of people shall be designated to minimize the damage caused by the most severe probable earthquake.

3. Major public facilities (i.e., treatment plants and pumping stations, major communication lines and terminals, evacuation routes) and emergency/disaster facilities (i.e., police and fire stations, ambulance services) shall be designed to withstand the most severe probable earthquake and remain operational.

4. Recognize the limitations of expansive and peat soils in designating areas for urban growth and development.

6. Development proposed within areas of potential geologic hazard shall not be subject to nor contribute to hazardous conditions (City of Stockton General Plan, 1990).

3.3.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The significance criteria for this analysis were developed from criteria presented in Appendix G of the CEQA Guidelines. Based on the actions proposed in Chapter 2, Project Description, a geologic, soils-related, or seismic hazard impact would be considered significant if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving or present a long term potential adverse effect to reclamation efforts after mining is complete:
  - Rupture of a known earthquake fault, as delineated in the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known potentially active fault (CGS Special Publication 42);
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction; and
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil to such a level that siltation would cause significant impacts on water quality and aquatic habitats;
- 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 UBC, creating substantial risks to life or property; or
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

METHODOLOGY

Based on a site reconnaissance of the project area and literature review and in the context of the applicable significance criteria, the impact analysis focuses on potential geologic hazards that could damage proposed DWSP facilities and possibly subject individuals to other secondary hazards. These geologic hazards include regional seismicity and associated ground motion, settlement, expansive and corrosive soils, soil erosion, regional subsidence and potential ground failure (e.g., liquefaction). Additionally, the analysis provides a clear distinction between construction-related effects and those associated with the long-term operation of the proposed DWSP.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.3-3 provides a summary of the significant and less than significant geological and/or soil-related impacts associated with specific DWSP facilities.

TABLE 3.3-3
SUMMARY OF IMPACTS – GEOLOGY, SOIL, AND SEISMICITY

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
GEO-1: Construction of the proposed DWSP could lead to accelerated soil erosion and possible sedimentation of local surface waters.	LSM	LSM	LSM	LSM	LSM
GEO-2: In the event of seismic activity strong ground motion, secondary hazards in the form of settlement, and/or associated ground failure (e.g., liquefaction) could possibly impact DWSP facilities.	LSM	LSM	LSM	LSM	LSM
GEO-3: Structural improvements associated with the proposed DWSP could be subject to soil-related hazards including expansive and/or corrosive soil materials or settlement.	LSM	LSM	LSM	LSM	LSM
GEO-4: DWSP facilities, including pipelines, intake facility, sub-surface foundations, and other underground utilities, would be subjected to hazards associated with regional subsidence.	LSM	LSM	LSM	LS	LSM

LSM = Less than Significant Impact with Mitigation
LS = Less than Significant Impact

IMPACT STATEMENTS AND MITIGATION MEASURES

Impact GEO-1: Construction of the proposed DWSP could lead to accelerated soil erosion and possible sedimentation of local surface waters. Less than significant with mitigation for all DWSP facilities.

Construction of the various DWSP facilities would expose bare soil to precipitation and wind erosion, thereby potentially resulting in increased sedimentation of local waterways. Ground-disturbing activities, including removal of vegetation, would cause increased water runoff rates and concentrated flows, thereby potentially leading to accelerated erosion. In agricultural areas, this would result in measurable losses to soil productivity. In addition, because construction would occur in close-proximity to local waterways, such effects to water quality and aquatic habitat would be considerable if proper erosion control measures are not implemented. Dewatering operations utilized during pipeline installation and the installation of sub-grade structures associated with the WTP also carries the potential for increased sedimentation of local waterways. This impact is considered potentially significant without mitigation.

The City is required to comply with Section 13-501 of its Municipal Code, which outlines the provisions required under the City of Stockton Grading and Erosion Control Ordinance. Measures to control erosion would generally be similar for all DWSP facilities; however, the placement of and actual practices employed would vary from site to site. For this reason, the implementation of erosion control measures as outlined in Mitigation Measure GEO-1 and with compliance with the erosion control plan and the Storm Water Pollution Prevention Plan (SWPPP) would reduce the impact to less than significant.

Mitigation Measure GEO-1: The City shall prepare a SWPPP for all construction phases of the proposed project, as required by the CVRWQCB. The objectives of the SWPPP are to identify pollutant sources that may affect the quality of storm water discharge and to implement Best Management Practices (BMPs) to reduce pollutants in storm water discharges.

BMPs may include, but would not be limited to:

- Excavation and grading activities in areas with steep slopes or directly adjacent to open water shall be scheduled for the dry season only (April 15 to October 15), to the extent possible. This will reduce the chance of severe erosion from intense rainfall and surface runoff.

- If excavation occurs during the rainy season, storm runoff from the construction area shall be regulated through a storm water management/erosion control plan that shall include temporary onsite silt traps and/or basins with multiple discharge points to natural drainages and energy dissipaters. Stockpiles of loose material shall be covered and runoff diverted away from exposed soil material. If work stops due to rain, a positive grading away from slopes shall be provided to carry the surface runoff to areas where flow would be controlled, such as the temporary silt basins. Sediment basins/traps shall be located and operated to minimize the amount of off-site sediment transport. Any trapped sediment shall be removed from the basin or trap and placed at a suitable location onsite, away from concentrated flows, or removed to an approved disposal site.

- Temporary erosion control measures shall be provided until perennial revegetation or landscaping is established and can minimize discharge of sediment into nearby waterways. For construction within 500 feet of a water body, appropriate erosion control measures shall be placed upstream adjacent to the water body.

- Erosion protection shall be provided on all cut-and-fill slopes. Revegetation shall be facilitated by mulching, hydroseeding, or other methods and shall be initiated as soon as possible after completion of grading and prior to the onset of the rainy season (by October 15).

- BMPs selected and implemented for the project shall be in place and operational prior to the onset of major earthwork on the site. The construction phase facilities shall be maintained regularly and cleared of accumulated sediment as necessary. Effective mechanical and structural BMPs that would be implemented at the project site include the following:

  - Mechanical storm water filtration measures, including oil and sediment separators or absorbent filter systems such as the Stormceptor® system, can be installed within the storm drainage system to provide filtration of storm water prior to discharge.

  - Vegetative strips, high infiltration substrates, and grassy swales can be used where feasible throughout the development to reduce runoff and provide initial storm water treatment.

  - Roof drains shall discharge to natural surfaces or swales where possible to avoid excessive concentration and channelization of storm water.

  - Permanent energy dissipaters can be included for drainage outlets.

  - The water quality detention basins are designed to provide effective water quality control measures including the following:

    - Maximize detention time for settling of fine particles;

    - Establish maintenance schedules for periodic removal of sedimentation, excessive vegetation, and debris that may clog basin inlets and outlets;

    - Maximize the detention basin elevation to allow the highest amount of infiltration and settling prior to discharge.

- Hazardous materials such as fuels and solvents used on the construction sites shall be stored in covered containers and protected from rainfall, runoff, vandalism, and accidental release to the environment. All stored fuels and solvents will be contained in an area of impervious surface with containment capacity equal to the volume of materials stored. A stockpile of spill cleanup materials shall be readily available at all construction sites. Employees shall be trained in spill prevention and cleanup, and individuals shall be designated as responsible for prevention and cleanup activities.

- Equipment shall be properly maintained in designated areas with runoff and erosion control measures to minimize accidental release of pollutants.

The SWPPP also will specify measures for removing sediment from water pumped for trench dewatering before the water is released to waterways.

Significance After Mitigation: Less than significant.

Impact GEO-2: In the event of seismic activity strong ground motion, secondary hazards in the form of settlement, and/or associated ground failure (e.g., liquefaction) could possibly impact DWSP facilities. Less than significant with mitigation for all DWSP facilities.

Intake Facility

The proposed intake facility could experience at least one major earthquake (greater than Moment Magnitude 7) throughout the operational life of the facility. Structural improvements associated with the intake facility, including levee fill materials, pump foundations, piles, and the access bridge, would be potentially damaged by such an event. Although ground motion resulting from a regionally active fault is an unavoidable hazard for the project region, the degree of hazard depends, in part, on the geologic substrate and the type of intake facility, its materials, and construction quality. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the moment magnitude, and the duration of shaking.

Field observations and soil borings completed by AGS, Inc. (2005) along the Empire Tract levee indicate that the intake site is underlain by a combination of artificial fill, levee deposits, peat and stratified river channel deposits. Ground motion associated with a major seismic event would result in localized liquefaction and/or non-uniform compaction (earthquake-induced differential settlement) of these underlying sediments. Adverse effects associated within such an event would include failure of backfill, damage to concrete slabs supporting pump station structures, and damage to pipeline connections. Significant damage to the intake facility would disrupt water service to various portions of the City. The length of such a disruption would depend on several factors including water demand, time of year, and the regional extent of earthquake-related damage.

The Empire Tract levee was constructed by the Corps and is classified as a "Direct Agreement Levee" (Delta Protection Commission, 2001). Maintenance activities for this levee are funded by the Corps and performed by the local Reclamation District (RD 2029)). Construction of the intake facility would require the placement of engineered fill to raise the existing levee and support land-side foundations. Pile foundations would be used for water-side structures within the San Joaquin River. The placement of fill materials and piles would require appropriate engineering beneath each structure to avoid earthquake-induced settlement and ground failure in the event of a major seismic event. Nonetheless, project-related construction on the levee would adversely affect its existing structural integrity.

Section 14-100 of the City of Stockton Municipal Code incorporates by reference the UBC and CBC, 2001 Edition including all appendices as published by the International Conference of Building Officials. For this reason, design of the in-river intake facility will be required to comply with the UBC and CBC amendments. Compliance will generally include the incorporation of site-specific geotechnical recommendations based on the expected PGA values for the project area as required by the City prior to approval of the intake facility's final design. These recommendations in conjunction with Mitigation Measure GEO-2 would reduce hazards associated with earthquake-induced ground motion and associated secondary geologic hazards to less than significant.

Raw and Treated Water Pipelines

The proposed raw and treated water pipelines could experience significant ground motion associated with at least one major earthquake (greater than Moment Magnitude 7) throughout the operational life of the project. Liquefaction along the pipeline alignments would cause misalignment of the pipelines and result in failure of a coupling joint. Liquefaction impacts associated with the proposed DWSP would be mitigated through the use of densification techniques, such as dynamic compaction or through the use of stone columns, vertical anchors (tension piles), sub-surfacing in a shallow trench, or thick-walled ductile-steel pipe. Design of the pipeline systems in accordance with UBC and AWWA standards in conjunction with the implementation of Mitigation Measure GEO-2 would minimize the risks associated with strong ground motion and secondary geologic hazards to less than significant.

Water Treatment Plant

The proposed WTP could experience at least one major earthquake (greater than Moment Magnitude XI) during the operational life of the project. Ground settlement due to ground motion would result in damage to below- and above-ground WTP structures, thereby potentially disrupting water services to the City. Seismic design consistent with current professional engineering and industry standards would be used in construction for resistance to strong ground motion, especially for lateral forces. The implementation of the seismic design criteria as required by the CBC and City's Municipal Code would reduce the potential for structural failure, major structural damage, and reduce the primary effects of ground motion on structures, and infrastructures to an acceptable level of risk. Additional requirements, recommended by a registered engineering geologist or geotechnical engineer, will also be incorporated into the WTP's design.

Accurate prediction of seismic events is not possible, nor can site-specific design entirely eliminate the potential for injury and damage that would occur during a seismic event. Nonetheless, conformance with City geotechnical and building code requirements and incorporation of Mitigation Measure GEO-2 would reduce potential impacts related to regional seismicity and secondary geologic hazards to less than significant.

Mitigation Measure GEO-2a: To reduce potential levee slope instability hazards along the San Joaquin River, the City shall retain a California-registered geotechnical or civil engineer to conduct a slope stability analysis of levees bordering the intake facility. The investigation will include an evaluation of the levee to determine if the soil materials present and the current level of compaction are satisfactory to support the proposed intake facility in the event of an earthquake based on the anticipated peak ground acceleration (PGA). If conflicting PGA values are obtained, the City will apply the greater of the two values to ensure maximum structural integrity. Recommendations from this analysis shall be incorporated into the final grading and foundation design and submitted to the County and City Engineering Divisions for review and approval before final grading and construction permits are issued. At a minimum, the intake's design will demonstrate compliance with 1997 UBC and 2001 CBC requirements for structures located in seismic zone 3.

Mitigation Measure GEO-2b: Facility design for all DWSP facilities will comply with the site-specific design recommendations as provided by a licensed geotechnical or civil engineer. These recommendations will be based on the anticipated PGA for each project-component within the overall project area. In instances where conflicting PGA values are obtained, the City will apply the greater of the two values to ensure maximum structural integrity. Design recommendations provided in the geotechnical report will demonstrate compliance with 1997 UBC and 2001 CBC requirements for structures located in seismic zone 3.

Mitigation Measure GEO-2c: To protect on-site personnel, ensure the integrity of the WTP facility and associated infrastructure (e.g., pipelines, intake structures, etc.), and minimize any disruption to water delivery in the event of a major earthquake, the City shall prepare an Earthquake Response Plan. The Earthquake Response Plan shall include an evacuation plan for all personnel-occupied structures and a post-earthquake inspection and repair plan to evaluate any damage that may have occurred and ensure the integrity of the mechanical systems to enable continued operation as soon as possible.

Significance After Mitigation: Less than significant.

Impact GEO-3: Structural improvements associated with the proposed DWSP could be subject to soil-related hazards including expansive and/or corrosive soil materials or settlement. Less than significant with mitigation for all DWSP facilities.

Intake Facility

Over time, settlement would occur beneath the intake facility as a result of increased foundation loads from overlying structures being placed on semi-consolidated deposits, such as artificial fill and river channel deposits. These materials may also contain highly-compressible organic soil materials that may settle over time as additional loads are applied. The near-surface soils at the intake facility would likely vary in composition both horizontally and vertically throughout the site. Total and differential settlement of site soils would therefore damage proposed foundations, structures, and utility lines. However, standard engineering practices (i.e., soil compaction) would generally mitigate these types of hazards and therefore, impacts related to settlement are considered less than significant.

Expansive soil materials can damage foundations of aboveground structures, paved service roads, and concrete slabs. Surface structures with foundations constructed in expansive soils may experience expansion and contraction depending on the season and the amount of surface water infiltration. The continual expansion and contraction would exert enough pressure on the structures to result in cracking, settlement, and uplift over time. However, standard engineering practices generally require the removal and replacement of expansive soil materials with non-expansive engineered fill that would prevent the impact of pressure or settlement. For this reason, impacts related to expansive soils would be minimal and therefore are less than significant.

Soil materials within the Delta region are known to have a high electrical conductivity, which suggests that these soils would be moderately to highly corrosive. Moderate to high corrosivity carries the potential to corrode underground metal pipes, foundation blocks, and electrical conduits. Failed subsurface electrical conduits would result in electrical short-circuiting, which would temporarily reduce power to the intake facility and possibly result in temporary shutdown of operations. This impact would be reduced to less than significant with the implementation of Mitigation Measure GEO-3.

Raw and Treated Water Pipelines

Soils with high potential for shrink swell may be found in various locations throughout the raw and treated water pipeline alignments. Unless properly mitigated, shrink-swell soils would exert additional pressure on buried pipelines producing shrinkage cracks that would allow water infiltration and compromise the integrity of backfill material. Depending on the depth of the buried pipeline, soil expansion or contraction would lead to undue lateral pipeline stress and stress of structural joints. Over time, lateral stresses would lead to pipeline rupture or leaks in the coupling joints. However, as standard engineering practices would be utilized during construction, expansive soil materials would be identified and replaced by non-expansive engineered fill material. These practices would be conducted under the supervision or a licensed geotechnical or civil engineer.

As indicated in the Setting section, soil materials encountered within the Delta region may have high electrical conductivities, thereby introducing the potential for corrosion. Corrosive soil materials would lead to pipe corrosion, potentially resulting in pipe failure and localized surface flooding of water or localized settlement of surface soils in the location of the failure. This impact would be reduced to less than significant with the implementation of Mitigation Measure GEO-3.

Water Treatment Plant

Soil-related hazards identified for the intake facility and pipelines would also apply to the WTP. The effects of expansive soil materials would result in cracking, settlement, and uplift of foundations of aboveground structures, paved service roads, and concrete slabs. Settlement of fill material would occur from static loads with possibly half of the settlement taking place during construction or shortly thereafter. Differential settlement would also occur due to variability in the underlying soil materials.

As a result, it would be necessary to design and construct structures, parking areas, and utility lines to accommodate the anticipated settlement. Surface drainage and subsurface gravity flow utilities would be designed with exaggerated gradients to account for future settlement. With the implementation of standard engineering practices, as required by the City, in conjunction with the implementation of Mitigation Measure GEO-3 for corrosive soils, soil-related impacts would be considered less than significant.

Mitigation Measure GEO-3a: The City shall install a cathodic protection system for all underground metallic fittings, appurtenances, and piping to protect these facilities from corrosion. The cathodic protection system shall be designed consistent with City standards.

Mitigation Measure GEO-3b: Isolation valves will be incorporated into all pipelines to prevent significant losses of surface water in event of pipeline rupture. The specifications of the isolation valves will conform to the UBC, AWWA, and City standards.

Significance After Mitigation: Less than significant.

Impact GEO-4: DWSP facilities, including pipelines, intake facility, sub-surface foundations, and other underground utilities, would be subjected to hazards associated with regional subsidence. Less than significant with mitigation for the intake facility and raw and treated water pipelines. Less than significant for the WTP.

Intake Facility

As previously discussed in the Setting section, land subsidence has been documented in the Delta and the San Joaquin River floodplain. Land subsidence is caused by a variety of agricultural practices that contribute to the oxidation and subsequent compaction and settlement of organic soils or by hydrocompaction. Subsidence within the western and central portions of the Delta over the long-term occurs on an average of one to three inches per year (USGS, 2000). Impacts of subsidence would affect DWSP operation(s) by lowering the land surface and adjacent levees overtime, and increasing the susceptibility of the intake facility to flooding. This impact would be less than significant with the implementation of Mitigation Measure GEO-4.

Raw and Treated Water Pipelines

Subsidence would cause potential damage or rupture to the buried pipelines and other associated structures designed with minimal tolerance for settlement. The implementation of Mitigation Measure GEO-4 would reduce this impact to less than significant.

Water Treatment Plant

The proposed WTP site is not located within an area identified as experiencing significant subsidence. Therefore, impacts to the proposed WTP as a result of regional subsidence are considered less than significant.

Mitigation Measure GEO-4: Final design of the intake facility will take into account projected subsidence rates within the eastern Delta to ensure that the finished floor elevation remains above the 100-year flood elevation and includes three feet of freeboard during the operational life expectancy of the intake facility. This will be accomplished by determining the projected rate of subsidence for Empire Tract over the next 100 years and adding that projected change in elevation onto the current design finished floor elevation for the intake facility. This design feature will ensure sufficient height above the 100-year flood elevation during the operational life of the DWSP.

Significance After Mitigation: Less than significant.

3.3.3 REFERENCES

AGS, Inc. 2005. Draft Preliminary Geotechnical Study. Delta Water Supply Project. Stockton, California. AGS Job No. KD0101. Prepared for MWH. January 2005.

California Department of Transportation (Caltrans). 2001. Highway Design Manual. Available at http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm.

California Geological Survey (CGS). 1997. Guidelines for Evaluating the Hazard of Surface Fault Rupture. CDMG Note 49, 1997.

California Geological Survey (CGS). 2002. How Earthquakes and Their Effects are Measured. Note 32.

City of Stockton. 1990. City of Stockton General Plan: Policy Document. Adopted January 22, 1990; last amended November 3, 1998.

Darrow, K. 2004. Personal Communication: Kermit Darrow, Architect/Senior Engineer, San Joaquin County, June 18, 2004.

Delta Protection Commission. 2001. A Report to the Delta Protection Commission. Background Report on Levees. Background Report No. 7. January 1994, Reprinted, February 2001.

Hackel, O. 1966. Summary of the Geology of the Central Valley. In E. H. Baily, ed. Geology of Northern California. California Division of Mines and Geology Bulletin 190:217-238.

Jennings, C. W. 1994. Fault Activity Map of California and Adjacent Areas. California Division of Mines and Geologic Data Map No. 6, 1:750,000.

Natural Resource Conservation Service (NRCS). 1992. Soil Survey for San Joaquin County (updated 1992).

Peterson, M. D., W. A. Bryant, and C. H. Cramer. 1996. PSHA for the State of California. CGS Open-File Report issued jointly with the USGS, CDMG 96-08 and USGS 96-706.

San Joaquin County. 1992. San Joaquin County General Plan 2010. Adopted July 29, 1992.

U.S. Geological Survey (USGS). 1968. 7.5' Topographic Quadrangle, Lodi South, CA. (Photo revised 1976).

U.S. Geological Survey (USGS). 1978. 7.5' Topographic Quadrangle, Terminous, CA. (Minor Revision 1993).

U.S. Geological Survey (USGS). 2000. Open-File Report 00-444. Preliminary Maps of Quaternary Deposits and Liquefaction Susceptibility, Nine-County San Francisco Bay Region, California: A Digital Database. Geology by: K. L. Knudsen, J. M. Sowers, R. C. Witter, C. M. Wentworth, and E. J. Helley. Digital Database by C. M. Wentworth, R. S. Nicholson, H. M. Wright, and K. H. Brown. Available at http://geopubs.wr.usgs.gov/open-file/of00-444/.

Wagner, D. L., C. W. Jennings, T. L. Bedrossian, and E. J. Bortugno. 1981. Geologic Map of the Sacramento Quadrangle, California. CDMG Regional Geologic Map 1A, scale 1:250,000.

Wakabayashi, J., and D. L. Smith. 1994. Assessment of Recurrence Intervals, Characteristic Earthquakes, and Slip Rates Associated with Thrusting along the Coast Range-Central Valley Geomorphic Boundary, California. Bulletin of the Seismological Society of America 84(6):1960-1970.

3.4 DRAINAGE AND FLOODPLAIN MANAGEMENT

This section addresses potential changes in surface water drainage and shallow groundwater conditions that would result from construction and operation of the DWSP. This section describes the existing hydrologic setting; the framework that regulates drainage and floodplain management; presents potential project impacts; and when necessary, provides appropriate mitigation. This section primarily focuses on surface water drainage, storm water management, and groundwater conditions.

3.4.1 SETTING

HYDROLOGY

The project area is characterized by a typical Mediterranean climate with wet, cold winters, and warm, dry summers. The majority of annual precipitation falls during the months of November through April. The mean annual rainfall in the project vicinity was approximately 16.6 inches between 1971 and 2000 (Western Regional Climate Center [WRCC], 2000). Water in San Joaquin County comes from both groundwater aquifers and surface water supplies. Most of the rivers entering San Joaquin County have been altered, with reservoirs providing both flood control and water supply for commercial, agricultural, municipal, and freshwater habitat use.

PROJECT AREA SETTING

Surface Water

Waterways

The proposed DWSP would be located within the Sacramento-San Joaquin Delta and the San Joaquin River and its floodplain north of the City. Portions of the project (i.e., the intake and the western half of the raw water pipeline alignment) would be located on two islands within the Delta. Empire Tract and King Island are isolated from upland areas by surrounding surface waterways, including Disappointment Slough, Bishop Cut, Honker Cut, and Little Connection Slough. These islands and waterways are shown in Figure 2-2 of Chapter 2, Project Description.

The hydrology and hydraulic character of the Delta, including specific characteristics of the waterways surrounding the project area, are discussed in detail in Chapter 4, Delta Water Resources and Fisheries

Along the proposed raw water pipeline alignment, surface water drains off Eight Mile Road and Empire Tract Road as sheet flow. In addition, drainage and irrigation ditches, located parallel and perpendicular to Eight Mile Road, convey surface water flow towards the San Joaquin River and the sloughs as well as the surrounding agricultural fields. The raw water pipeline alignment would tunnel under Honker Cut and, Bishop Cut, and parallel Pixley Slough. The treated water pipeline alignment would cross Pixley Slough and Bear Creek.

The proposed WTP site is an upland area currently in agricultural production, where surface water flows as sheet flow and/or infiltrates into the groundwater.

San Joaquin River Tides

The Sacramento/San Joaquin Delta experiences two low tides and two high tides every 24.8 hours. The height of any two successive high tides or successive low tides usually differs greatly. Also, the tidal range changes throughout the month. Tides with the greatest range occur during the new and full moon and are called spring tides; at this time, there is the greatest difference between successive daily highs or lows. Tides with the least range occur during the moon's quarters and are called neap tides; at this time, there is the least difference between successive daily high and low tides. Tides also vary on an annual cycle, with extreme high and low tides occurring in May and June and November and December (ABAG, undated).

In June 2004, at Wards Island on Little Connection Slough, high tides ranged from 2.2 to 4.1 feet above msl, while low tides ranged from 0.6 feet below msl to 1.3 feet above msl (Tides High and Low, Inc., 2004). The position of the saline/ fresh water interface depends upon the tidal cycle and the flow of freshwater through the San Joaquin River (USGS, 2000).

Floodplains

The portion of the project site west of Bishop Cut, which includes the proposed intake site and the approximate western half of the proposed raw water pipeline alignment, is contained within the Federal Emergency Management Agency (FEMA) 100-year floodplain of the San Joaquin River. Areas east of Bishop Cut are outside the FEMA 100-year floodplain, except for where Pixley Slough intersects Eight Mile Road southwest of the proposed WTP site. Pixley Slough carries the 100-year flood. Because its 100-year flows are contained within its banks, there is no floodplain associated with Pixley Slough (FEMA, 1988; FEMA, 2002a; FEMA, 2002b; FEMA, 2002c). Figure 3.4-1 shows the 100-year floodplain in the vicinity of the project area.

Agricultural Ditches and Drainage Canals

Agricultural lands within the project area are supplied with surface water for irrigation through a series of numerous ditches and drainage canals. In general the ditches and canals are oriented parallel and perpendicular to roads and levees within the project area. Drainage and irrigation ditches are located parallel and perpendicular to Eight Mile Road, Lower Sacramento Road, and Empire Tract Road.

Because of the elevation differences between the surrounding waterways, levees, and the interior of the islands, agricultural return flows and other surface drainage are pumped over the surrounding levees to the adjacent waterways connecting to the San Joaquin River.

SOURCE: FEMA, 1988, 2002a, 2002b, and 2002c; and Environmental Science Associates, 2005

Figure 3.4-1
Approximate Location of 100-Year Floodplain

Groundwater

Local Groundwater

Beneath the COSMA lays a large aquifer extending north and south through the Central Valley and consisting of unconsolidated sediments derived from the Coast Ranges and the Sierra Nevada Mountains. This aquifer provides water to many communities and is also used for agricultural purposes throughout the Central Valley. The Eastern San Joaquin County Groundwater Basin is the primary source of drinking water in San Joaquin County (San Joaquin County, 1992).

Figure 3.4-2 shows approximate depth to groundwater within the DWSP project area. Depth to groundwater increases with distance from the Delta. Depth to groundwater is about 1.6 to three feet bgs in the vicinity of the proposed intake site extending eastward to about one mile east of I-5, where groundwater depth ranges from four to five feet bgs. For the remainder of the project area, groundwater depths are greater than five feet bgs.

REGULATORY SETTING

Federal

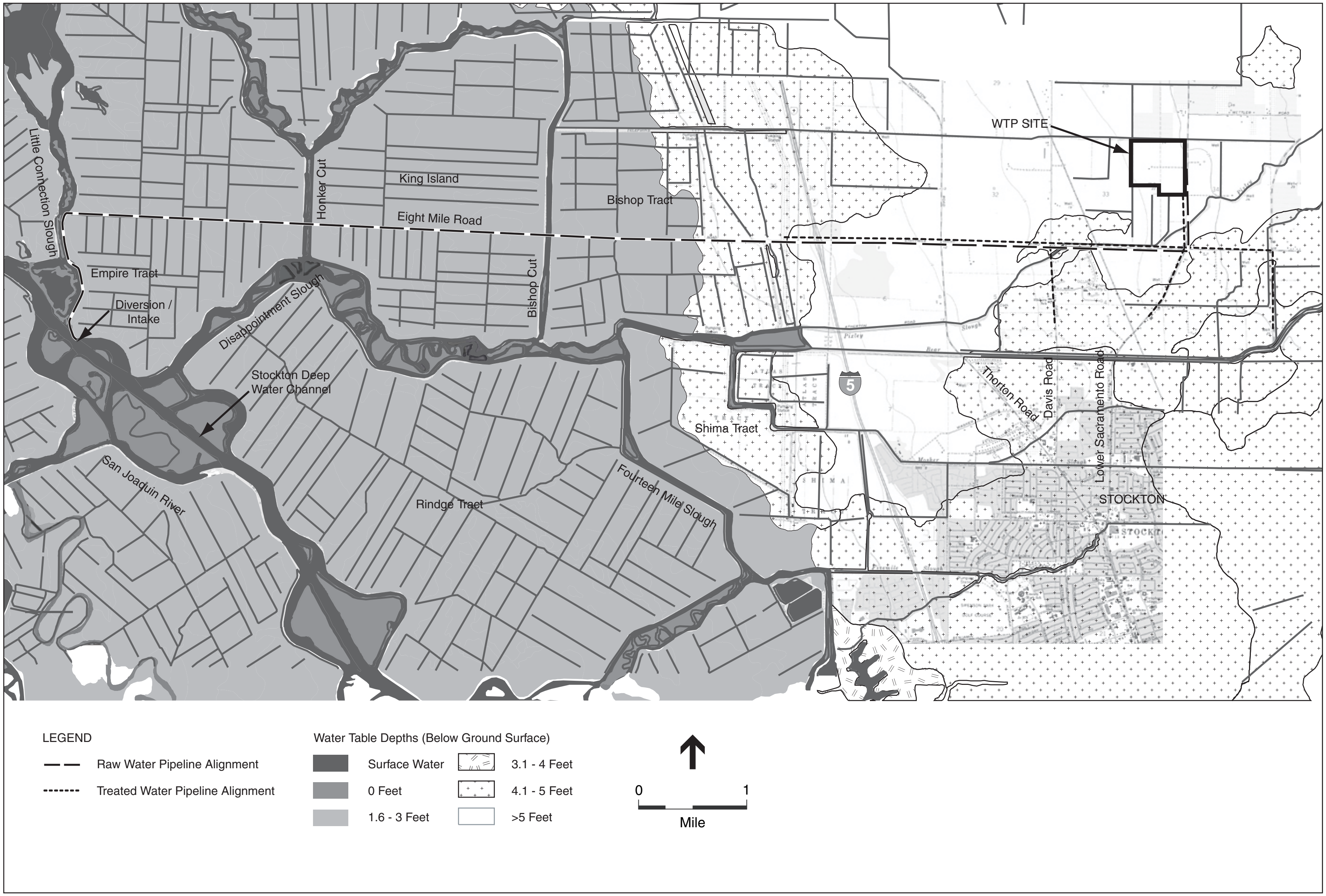
Executive Order 11988

Under Executive Order 11988, the FEMA is responsible for management of floodplain areas defined as the lowland and relatively flat areas adjoining inland and coastal waters subject to a one percent or greater chance of flooding in any given year (the 100-year floodplain). FEMA requires that local governments covered by federal flood insurance pass and enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year floodplain. Figure 3.4-1 shows approximate locations of the 100-year floodplain within the project area.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California. The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout the state, while the CVRWQCB conducts planning, permitting, and enforcement activities. Section 401 of the Clean Water Act requires an applicant for any federal permit that proposes an activity which may result in a discharge to "waters of the United States" obtain certification from the state that the discharge will comply with other provisions of the Act. Certification is provided by the CVRWQCB. Any local or jurisdictional water quality programs must also be addressed when constructing in areas that influence the quality of surface and groundwater.



SOURCE: SSARGO, 2002; and Environmental Science Associates, 2005

Figure 3.4-2
Approximate Water Table Depths

Regional Water Quality Control Plan

The CVRWQCB is responsible for the protection of beneficial uses of water resources within the San Joaquin River Basin. The CVRWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and has adopted its Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins to implement plans, policies, and provisions for water quality management (CVRWQCB, 1998). Beneficial uses of surface waters are described in the Basin Plan and are designated for major surface waters and their tributaries. In addition to identification of beneficial uses, the Basin Plan also contains water quality objectives that are intended to protect the beneficial uses of the Basin.

If dewatering is required during construction, the discharge of construction water would require permits either from the CVRWQCB for discharge to surface creeks and groundwater or from local agencies for discharge to storm or sanitary sewers. The contractor would be required to obtain necessary permits for dewatering to comply with permit requirements for sampling and monitoring of the groundwater to identify water quality and suitability for discharge to creeks or canal systems; thereby protecting surface water quality.

Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

The SWRCB's 1995 Water Quality Control Plan (WQCP) for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary (Delta Plan) establishes water quality control measures which contribute to the protection of beneficial uses in the Bay-Delta Estuary. The Bay-Delta WQCP supplements other water quality control plans adopted by the SWRCB and Regional Water Quality Control Boards (RWQCBs), and State policies for water quality control adopted by the SWRCB, relevant to the Bay-Delta Estuary watershed. The Bay-Delta WQCP covers salinity, water project operations, and dissolved oxygen.

NPDES Permit for Construction Activity

The CVRWQCB administers the National Pollution Discharge Elimination System (NPDES) storm water permitting program in the Central Valley region. Construction activities disturbing one acre or more of land are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). The City must submit a Notice of Intent to the CVRWQCB to be covered by the General Construction Permit prior to the beginning of construction. The General Construction Permit requires the preparation and implementation of a SWPPP. The SWPPP must be prepared before construction begins.

Local

San Joaquin County General Plan

The San Joaquin County General Plan (1992) includes the following relevant policies related to flooding and water quality:

Flooding

Policies

1 New residential, public, commercial, and industrial development shall be required to have protection from a 100-year flood.

Water Quality

Policies

1 Water quality shall meet the standards necessary for the uses to which the water resources are put.

2 Surface water and groundwater quality shall be protected and improved when necessary.

3 The use and disposal of toxic chemicals, the extraction of resources, and the disposal of wastes into injection wells shall be carefully controlled and monitored to protect water quality.

15 The County shall encourage reduction of pavement area in project design and the use of permeable pavements where possible.

San Joaquin County Storm Drainage Study and Master Plan

New storm drainage facilities would be constructed in accordance with the *Storm Drainage Study and Master Plan* developed by San Joaquin County (1973). This plan covers the entire County including incorporated cities. The plan divided metropolitan Stockton into seven study areas and examined deficiencies in the existing systems and recommended design standards (San Joaquin County, 1973).

City of Stockton Department of Public Works

The City has adopted standard specifications as a guide for standardization of public works installations within the City (City of Stockton Department of Public Works, 2003). These specifications also contain countywide standards that have been accepted by the City Council upon the recommendation of the City Engineer. These specifications outline requirements for clearing, grubbing and earthwork, and storm water drainage facilities, including detention and retention basins.

City of Stockton Municipal Utilities Department (MUD), Storm Water Management Division

The Storm Water Management Division within the Stockton MUD has developed the Model SWPPP for Construction Activities (Stockton MUD, 1997). The Model SWPPP is designed to minimize the amount of paperwork required for permit compliance, and provide an easy-to-follow format that can be adapted for use at any facility. The Storm Water Management Division also has developed guidelines for minimum BMPs to prevent and control storm water pollution from new developments during construction and after construction is completed. The Storm Water Management Division has primary responsibility for the development and implementation of the City of Stockton Storm Water Management Plan (City of Stockton, 2003a). The proposed DWSP would most likely be required to operate under the City's Stormwater Quality Control Criteria Plan (City of Stockton, 2003b).

City of Stockton General Plan

The City of Stockton General Plan Land Use, Public Facilities and Services, and Safety Elements contain goals and policies related to drainage and water quality relevant to the DWSP (City of Stockton, 1990). The following goals and policies are provided in the Land Use, Public Facilities and Services, and Safety Elements as they relate to water quality and drainage.

Land Use

Goal 4: Promote and maintain environmental quality and the preservation of agricultural land while promoting logical and efficient urban growth.

Policy:

5. Storm water quality measures shall be undertaken to enhance to the maximum extent practicable the quality of the water in the sloughs, creeks, and rivers in this area.

Public Facilities and Services (Water Facilities)

Goal 1: Conserve groundwater and surface water resources in order to ensure sufficient supplies of good-quality water.

Policies:

Land use activities that use or store hazardous materials shall be regulated and monitored in order to prevent the contamination of groundwater or surface water resources.

4. The use of BMPs for the reduction of pollutant in urban runoff shall be encouraged within the storm drainage system in order to reduce the amount of pollutants entering the surface waters.

12. The City will comply with the requirements of the Clean Water Act with the intent of minimizing the discharge of pollutants into surface waters.

Safety (Flood Hazards)

Goal 1: Protect the community from the risk of flood damage.

Policy:

1. New urban development shall be approved only when the developer shows it to be protected from the "100-year" floods.

3.4.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The CEQA defines a significant effect on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. A hydrologic or water quality-related hazard impact would be considered significant if it would result in any of the following, which are adapted from the CEQA Guidelines, Appendix G:

- 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 level (e.g., the production 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 alteration of the course of a stream or river, in a manner which would result in substantial erosion of siltation on- or off-site;
- Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned storm water 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 within a 100-year flood hazard area structures which would 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

METHODOLOGY

This section identifies drainage and floodplain management issues that may be affected by the DWSP. The impact analysis focuses on foreseeable changes to baseline conditions in the context of the significance criteria presented above. Impacts of the project were assessed for the construction and operation of all DWSP facilities and the staging areas required for these facilities. Chapter 2, Project Description provides details on the construction and operation of these facilities.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.4-1 provides a summary of the significant and less than significant drainage and floodplain management impacts associated with the DWSP facilities.

TABLE 3.4-1
SUMMARY OF IMPACTS – HYDROLOGY, FLOODING, AND WATER QUALITY

Impact	In-River Intake facility	In-Bank Intake facility	Raw Water Pipelines	WTP	Treated Water Pipelines
DFM-1: Dewatering of excavated areas during construction in areas of shallow groundwater could affect surface water quality.	LSM	LSM	LSM	LSM	LSM
DFM-2: DWSP construction activities could result in increased erosion and sedimentation, or release fuels or other hazardous materials associated with construction equipment that could impact surface water quality.	LSM	LSM	LSM	LSM	LSM
DFM-3: DWSP intake and WTP facilities would increase the amount of impervious surfaces, which in turn would increase local storm runoff volumes that could exceed the capacity of on-site drainage systems, and create localized flooding or contribute to a cumulative flooding impact downstream.	LSM	LSM	NI	LSM	NI
DFM-4: Removal and stockpiling of tunnel spoils during construction of the raw and treated water pipelines could release chemicals or spoils into the surrounding environment that could affect surface water quality.	NI	NI	LSM	NI	LSM
DFM-5: Construction of the intake facility and raw water pipelines could potentially increase the risk of flooding on Empire Tract and King Island.	LSM	LSM	LSM	LS	LS

LSM = Less than Significant Impact with Mitigation
LS = Less than Significant Impact
NI = No Impact

IMPACT STATEMENTS AND MITIGATION MEASURES

Impact DFM-1: Dewatering of excavated areas during construction in areas of shallow groundwater could affect surface water quality. Less than significant with mitigation for all DWSP facilities.

Because the intake facility is located on the San Joaquin River floodplain and the groundwater depth is approximately 1.6 to three feet bgs (Figure 3.4-1), dewatering would be required during construction. For the raw water pipeline alignment, groundwater is approximately 1.6 to three feet bgs along Empire Tract Road and Eight Mile Road to about one mile east of I-5. For the remainder of the project area, groundwater depths range from 4.1 to greater than five feet bgs. In the event that groundwater is encountered during construction, dewatering would be required.

Excavation, shoring, and construction staging in areas where groundwater would be encountered would result in a temporary reduction in groundwater quality. Therefore, in areas containing shallow groundwater, dewatering activities would be required. The groundwater quality (i.e., turbidity, sediment content, or presence of nutrients) would adversely affect receiving water quality of local surface waters. If chemicals (oils, grease, fluids, etc.) are present or sediment is released into the extracted water, discharge of this groundwater into surface water would affect surface water quality. Implementation of Mitigation Measure DFM-1 would ensure that in the event that dewatered groundwater cannot be collected, potential impacts related to groundwater dewatering would be reduced to less than significant.

Mitigation Measure DFM-1: During construction if groundwater can not be contained on-site, the City shall pump the water into multiple gallon Baker tanks or approved equivalent with either a filter or gel coagulant system or other containment to remove sediment. The remaining water will then be discharged to irrigation ditches. On upland areas sprinkler systems may be used to disperse the water in farmers' fields. BMPs, as described in the SWPPP, will also be implemented, as appropriate, to retain, treat, and dispose of groundwater. Measures shall include but are not be limited to:

- Retaining pumped groundwater in surface facilities to reduce turbidity and suspended sediments concentrations.
- Treating (i.e., flocculate) pumped groundwater, as appropriate, to reduce turbidity and concentrations of suspended sediments.
- Directly conveying pumped groundwater to a suitable land disposal area capable of percolating flows.

If contamination is suspected, water collected during dewatering will be tested for contamination prior to disposal. Discharges shall comply with the CVRWQCB's requirements.

Significance After Mitigation: Less than significant.

Impact DFM-2: DWSP construction activities could result in increased erosion and sedimentation, or release fuels or other hazardous materials associated with construction equipment that could impact surface water quality. Less than significant with mitigation for all DWSP facilities.

Construction of the proposed intake facility and WTP would involve excavation, soil stockpiling, grading, and the installation of support buildings, surge protection facilities, intake, and raw and treated water pipelines. Construction of the raw and treated water pipelines would occur primarily by open trench construction adjacent to existing roadways, and trenchless construction methods at sensitive areas (e.g., waterway crossings). Tunneling would be used for crossing intersection of Empire Tract Road and Eight Mile Road, Honker Cut, Bishop Cut, I-5, Union Pacific Railroad tracks, and Pixley Slough along the pipeline alignments. Staging areas on both ends of a tunnel crossing would be necessary for storage of pipe sections and boring equipment. All construction work related to pipe installation near natural waterway crossings would be done outside of the streambed.

Construction activities could cause erosion and transportation of soil particles that, once in surface water runoff, could cause sediment and other pollutants to leave the construction site and affect the water quality of the San Joaquin River and/or other surface water in adjacent agricultural fields. Hazardous materials associated with construction equipment and practices, such as fuels, oils, antifreeze, coolants, and other substances, could adversely affect water quality if released to groundwater or surface water. Sediments often transport substances such as nutrients, hydrocarbons, and trace metals, to receiving waters. Excess sediment loads could affect the water quality of the San Joaquin River and/or surface waters in adjacent agricultural fields. Sediment from project-induced on-site erosion could accumulate in downstream drainage facilities, interfere with flows, and aggravate downstream flooding conditions.

In order to mitigate potential water quality impacts during construction, Mitigation Measure GEO-1 requires the City to prepare a SWPPP for all construction activities associated with the proposed DWSP, as required by the CVRWQCB. Erosion control measures that the City proposes as part of construction would be included in the SWPPP. Compliance with the SWPPP would reduce the potential erosion of soils and the release of hazardous materials into water courses. Therefore, construction activities would not violate water quality standards, thus reducing potential impacts to a less than significant.

Mitigation Measure: Implementation of Mitigation Measure GEO-1 will reduce potential impacts to less than significant. No additional measures will be required.

Significance After Mitigation: Less than significant.

Impact DFM-3: DWSP intake and WTP facilities would increase the amount of impervious surfaces, which in turn would increase local storm runoff volumes that could exceed the capacity of on-site drainage systems, and create localized flooding or contribute to a cumulative flooding impact downstream. Less than significant with mitigation for the intake facility and the WTP.

The development of the 56-acre WTP site would involve paving and construction of buildings and structures, e.g., operations and administration building, chemical building, substation and electrical building, clearwells, and access roads. Within the process area, approximately 39 acres would be comprised of open-water facilities such as ponds and basins that would not contribute to storm water runoff. The remaining 17 acres would be comprised of impervious surfaces resulting in a higher percentage of runoff than the current agricultural field.

Development of the intake facility would involve paving and construction of buildings. An electrical and control building would be constructed for the in-bank intake facility, and a pump and electrical building would be constructed for the in-river intake facility. Both the in-river and in-bank intake facilities would be comprised of approximately one acre of impervious surfaces.

Asphalt, rooftops, concrete surfaces, and other structures prevent the natural drainage and infiltration of storm water through the soil. Surface water runoff generated from undeveloped, unpaved areas has greater volume and rate when the site is paved and the capability of surface water infiltration is reduced or eliminated. Increases in impervious surfaces and the resulting increases of surface water runoff volumes and rates can produce considerable changes to downstream hydrology in areas where portions of the drainage system are converted from pervious to impervious surfaces.

Storm water runoff from the WTP's process area will be drained to a small water quality basin and then pumped to the existing drainage ditch located along the north property line. Because there is no public sewer in the vicinity of the WTP site, domestic wastes from the operations and administration building will be disposed of using onsite treatment methods such as a septic tank and leach field. The DWSP will have its facilities designed in accordance with the provisions of the City's Stormwater Quality Control Criteria Plan, which provides measures for a project to manage increased runoff from increased impervious surfaces. Measures to be implemented may include detention basins, vegetated swales, buffer strips, and/or infiltration basins. Therefore, this impact would be reduced to less than significant with the incorporation of Mitigation Measure DFM-3 below.

Mitigation Measure DFM-3: The City shall comply with all measures of the City's Stormwater Quality Control Criteria Plan to effectively manage and minimize increases in storm water runoff resulting from the operation of DWSP facilities. Measures to be implemented may include detention basins, vegetated swales, buffer strips, and/or infiltration basins.

Significance After Mitigation: Less than significant.

Impact DFM-4: Removal and stockpiling of trench and tunnel spoils during construction of the raw and treated water pipelines could release chemicals or spoils into the surrounding environment that could affect surface water quality.

Construction of the raw and treated water pipelines would occur primarily by open trench construction adjacent to existing roadways. Trenchless construction techniques would be used for crossing sensitive areas (e.g., Honker Cut, Bishop Cut, I-5 and Union Pacific Railroad) along the pipeline alignments. Staging areas at both ends of a crossing would be necessary for storage of pipe sections and equipment.

Trench and tunnel spoils or materials, removed from the subsurface as pipe is installed, would contain lubrication and hydraulic chemicals, very fine sediments, and would have a high water content. Release of these spoils into surface water runoff or soils in adjacent agricultural fields would cause potential adverse effects on surface water quality and soil productivity. This impact would be reduced to less than significant with the incorporation of Mitigation Measure DFM-4 below.

Mitigation Measure DFM-4: The City shall limit impacts due to trench and tunnel spoils by hauling contaminated spoils off-site and disposing of them at a permitted waste disposal facility. Spoils containing high volumes of water shall either be transported off-site to a suitable disposal area or retained on-site and treated similar to the pumped groundwater specified in Mitigation Measure DFM-1.

Significance After Mitigation: Less than significant.

Impact DFM-5: Construction of the intake facility and raw water pipelines could potentially increase the risk of flooding on Empire Tract and King Island. Less than significant with mitigation for intake facility and raw water pipelines.

Both the in-river intake and the in-bank intake would be constructed on the river side of the existing levee. The in-bank intake would be constructed into the levee; the raw water pipelines would pass through or under the levee. Construction crews and equipment would require access to and over the levee into the river channel. The DWSP intake and pipeline penetration would comply with conditions of the State Reclamation Board permit, which covers construction, operation, and maintenance, to ensure the integrity and safety of the levee and access to the levee for maintenance or repair is not restricted.

Construction of the intake and pipeline would be scheduled per the State Reclamation Board requirements in order to ensure that the potential for increased flooding during construction would be minimized. The pipeline has been specifically sited to be 250 feet away from the toe of the levee, outside of the local Reclamation District's jurisdiction and the area of potential concern. Construction design calls for tunneling the pipeline beneath the intersection of Empire Tract Road and Eight Mile Road, Honker Cut, and Bishop Cut, and for open trench construction everywhere else. Agricultural and drainage ditches would be restored to their original dimensions following pipeline installation.

The construction contractor would develop and implement an Erosion Control and Sedimentation Plan, which will include all the necessary local jurisdiction requirements regarding erosion control as required in the SWPPP and described in Section 3.3, Geology, Soils, and Seismicity.

Mitigation Measure DFM-5: Implementation of Mitigation Measure GEO-1will reduces potential impacts to less than significant. In addition, the construction contractor will secure a permit from the State Reclamation Board for modifications to the levee in the vicinity of the intake and tunneling for pipeline crossings of jurisdictional waterways. The construction contractor will also develop and implement an Erosion Control and Sedimentation Plan, which will include all the necessary local jurisdiction requirements regarding erosion control as required in the SWPPP.

Significance After Mitigation: Less than significant.

3.4.3 REFERENCES

Association of Bay Area Governments (ABAG). Undated. State of the Estuary Report: San Francisco Estuary Project. Available at http://www.abag.ca.gov/bayarea/sfep/reports/soe/soe2.htm

Central Valley Regional Water Quality Control Board (CVRWQCB). 1998. Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins. 4th ed. Sacramento, California.

City of Stockton. 2002. 2002 Drinking Water Quality Report.

City of Stockton. 2003a. City of Stockton Storm Water Management Plan. Dated September 30, 2003.

City of Stockton. 2003b. Stormwater Quality Control Criteria Plan. Adopted November 2003.

City of Stockton. 1990. City of Stockton General Plan: Policy Document. Adopted January 22, 1990; last amended November 3, 1998.

City of Stockton Department of Public Works. 2003. City of Stockton Standard Specifications, adopted November 25, 2003.

City of Stockton Municipal Utilities Department (SMUD). 1997. Model Storm Water Pollution Prevention Plan for Construction Activities. May 15, 1997.

Federal Emergency Management Agency (FEMA). 1988. Flood Insurance Rate Map: San Joaquin County (Unincorporated Areas), California, Panel 265 of 925, community panel number 0602990265B.

Federal Emergency Management Agency (FEMA). 2002a. Flood Insurance Rate Map: San Joaquin County (Unincorporated Areas), California, Panel 270 of 925, community panel number 0602990270C.

Federal Emergency Management Agency (FEMA). 2002b. Flood Insurance Rate Map: San Joaquin County (Unincorporated Areas), California, Panel 290 of 925, community panel number 0602990290C.

Federal Emergency Management Agency (FEMA). 2002c. Flood Insurance Rate Map: San Joaquin County (Unincorporated Areas), California, Panel 295 of 925, community panel number 0602990295C.

San Joaquin County. 1973. Storm Drainage Study and Master Plan 1973. Adopted by the Stockton City Council in 1975.

San Joaquin County. 1992. San Joaquin County General Plan 2010. Adopted July 29, 1992.

Soil Survey Geographic Database (SSURGO). 1999. National Cartography and Geospatial Center, USDA – Natural Resources Conservation Service. ID: CA077 San Joaquin County, California. October 18, 1999.

State Water Resources Control Board (SWRCB). 1995. Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. Sacramento, California. May 1995.

Tide High and Low, Inc. 2004. Station Data for Wards Island, Little Connection Slough. , Available at: http://www.saltwatertides.com/dynamic.dir/californiasites.html#joaquin.

U.S. Geological Survey (USGS). 2000. Delta Subsidence in California: The Sinking Heart of the State. Fact Sheet FS-005-00. April 2000.

Western Regional Climate Center (WRCC). 2000. Period of Record Monthly Climate Summary, Stockton Fire Station #4, California. Available at: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?castfs+nca.

3.5 BIOLOGICAL RESOURCES

This section provides an overview of existing biological resources, excluding fish and other aquatic resources, which are known to occur within the project area and surrounding region, including a review of potentially occurring "special-status" species, wildlife habitats, vegetation communities, and jurisdictional waters of the U.S. This section assesses the potential of the proposed DWSP to result in impacts to sensitive biological resources and identifies mitigation measures designed to eliminate or reduce potential project-related impacts. The results of this assessment are based upon field reconnaissance of the project area, literature searches, and database queries. Chapter 4, Delta Water Resources and Fisheries contains information on fish and other aquatic resources in the DWSP area.

References reviewed for this section included the following:

- Lodi South and Terminous, California U.S. Geological Survey (USGS) 7.5' quadrangle maps (USGS, 1968, 1978);
- Color aerial photographs (GlobeXplorer, 2001);
- California Natural Diversity Database, Rarefind 3 computer program (CDFG, 2004a);
- California Native Plant Society (CNPS), Electronic Inventory computer program (CNPS, 2004);
- Special Animals List (CDFG, 2004b);
- Special Plants List (CDFG, 2004c); and
- San Joaquin County Multi-Species Habitat Conservation and Open Space Plan. San Joaquin Council of Governments, Stockton, California. November 14, 2000.

3.5.1 SETTING

REGIONAL SETTING

The project area is located in the northern San Joaquin Valley within basin-type physiography. Basins are common in the San Joaquin Valley, and are commonly associated with hardpans and high clay content (McElhiney, 1992). Portions of the project (i.e., the intake and the western half of the raw water pipeline alignment) are within the Primary and Secondary Zones of the Sacramento-San Joaquin Delta. Tracts of former freshwater wetlands were drained beginning in the 1850s. Land subsidence below sea level is common in the Delta, as a result of both compaction and oxidation of organic soils, including peats and mucks.

San Joaquin County is located in the central region of the Central Valley. 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.

PROJECT AREA SETTING

Within the project area, upland agriculture is the predominant land use. Residential and golf course developments also occur in the vicinity of the intersection of Eight Mile Road and I-5. Scattered rural residences exist in association with agricultural activities. Elevation in the project area ranges from -11 feet mean sea level (msl) in the western portion to +26 feet msl in the eastern portion.

The following information is based on field assessments conducted by biologists in November 2003, March and April 2004, and March 2005. Field assessments were conducted by driving the project area's network of roadways and walking portions of the project area. The project area was evaluated for the occurrence of jurisdictional waters of the U.S., and the potential to support regionally occurring special-status species and sensitive habitats. Plant and animal species that were observed during site visits are presented in **bold**.

Vegetative Communities and Wildlife Habitats

Vegetative communities (assemblages of plant species that occur together in the same area) in the project area have been substantially modified from their natural state. Therefore, they are not easily described using standard vegetation classification schemes such as Sawyer and Keeler-Wolf (1995). Since vegetative communities generally correlate with wildlife habitat types, conditions in the project area were identified and described based on the CDFG's *A Guide to Wildlife Habitats* (Mayer and Laudenslayer, 1988), with minor modifications where appropriate (e.g., under cropland).

Five primary community types occur in the project area:

- Cropland and Irrigated hayfields
- Fresh emergent wetland
- Valley foothill riparian
- Riverine
- Urban

For each of these communities, Table 3.5-1 describes the location(s) and acreage within the site of each component of the proposed DWSP. Two communities recognized by CDFG as sensitive occur within five miles of the project area (CDFG, 2004a): (1) Coastal and Valley Freshwater Marsh, and (2) Valley Oak Woodland. These records are consistent with the field observations. Elements of these communities are present in the raw water pipeline alignment: freshwater marsh occurs in

TABLE 3.5-1
NATURAL COMMUNITIES WITHIN PROPOSED PROJECT AREA

		Acres within Project Facility Sites		
Community	**Location in Project Area**	**Intake Facility**	**Raw and Treated Water Pipelines**	**Water Treatment Plant**
Cropland	Throughout project area.	0.9	123.9	125.5
Freshwater emergent wetland	Associated primarily with ditches agricultural/drainage ditches paralleling Eight Mile Road and West Lane. Pipeline siting would minimize impacts to wetlands. One seasonal wetland occurs at intake site.	0	7.1	0.5
Valley foothill riparian	Patches along larger agricultural ditches along Eight Mile Road and Pixley Slough near Davis Road. Margins of larger channels (e.g., Honker Cut) are rip-rapped and do not support vegetated riparian habitat within project area.	0	0.7	0
Riverine	Larger channels (e.g., San Joaquin River, Honker and Bishop Cuts, and Pixley Slough)	4.6	10.5	0
Urban	Central to eastern portions of project area, and roads throughout project area.	3.6	87.8	0

channels and ditches, and single to small groups of valley oaks occur on roadsides and near rural residences.

Cropland

Land use in the project area is dominated by agriculture in areas that are not in urban development. A variety of crops, including oatgrass, alfalfa, corn, and grapes, are presently grown in the area. Agricultural ditches (described under Fresh Emergent Wetlands below) occur along field perimeters providing upland/channel interface habitat.

Cropland habitat may be used by a variety of common wildlife, such as **killdeer** (*Charadrius vociferus*), **yellow-billed magpie** (*Pica nuttalli*), **American crow** (*Corvus brachyrhynchos*), American pipit, savannah sparrow (*Passerculus sandwichensis*), **California ground squirrel** (*Spermophilus beecheyi*), and California meadow vole (*Microtus californicus*). Croplands also provide foraging habitat for sensitive wildlife species, including **Swainson's hawk** (*Buteo swainsoni*) and burrowing owls (*Athene cunicularia*). During the field assessment, ground squirrel and other medium-sized mammal burrows (that may be used for nesting and roosting by burrowing owls) were observed especially adjacent to agricultural lands in the eastern part of the project area.

Fresh Emergent Wetlands

Wetlands are areas that are periodically or permanently inundated by surface or ground water, and support specific vegetation adapted for life in damp soil. On a regional and national level, wetlands are recognized as important due to high inherent value to fish and wildlife. Wetlands also provide water recharge, filtration, and purification functions. Included within the mosaic of natural communities of San Joaquin County is a portion of wetlands that makes up the Delta. The Delta includes significant amounts of habitat critical for migratory waterfowl and wintering wildlife. Inland marshes and seasonal wetlands contained within ditches also provide valuable foraging, cover, and resting habitat for a variety of bird and mammal species. The different types of wetlands are described below.

A wetland delineation of waters of the U.S., including navigable non-wetland waters (ESA, 2004), found within and adjacent to the project area was verified by the U.S. Army Corps of Engineers (Corps) on June 1, 2004. The verified wetland delineation identified 22 wetland ditches (5.89 acres), one seasonal wetland area (0.60 acre), and several tule patches (0.28 acre) along channel margins of open water for a total of 6.77 acres of wetlands. In March 2005, the 2004 delineation mapping was revised to reflect project design refinements. The revised delineation identified 42 wetland (agricultural/drainage) ditches (7.57 acres) and one seasonal wetland area (0.02 acre) for a total of 7.59 acres of wetlands occurring within and adjacent to the proposed project sites. Because of project design changes, tule patch wetlands were not identified in the revised wetland delineation thus this wetland type is not described below.

Wetland Ditches

Wetland ditches, consisting of agricultural and flood control drainage ditches, are the most common type of wetland in the project area. Large ditches (up to 30 feet wide) parallel the south side of Eight Mile Road along the raw and treated pipeline alignments, typically separating the road from agricultural fields. Smaller ditches run in a north-south direction along field edges, and connect via culverts to the roadside ditches. Larger agricultural ditches are managed to control aquatic nuisance species such as **water-hyacinth** (*Eichhornia crassipes*) and **water-milfoil** (*Myriophyllum* sp.). Ditches generally have steep banks, and are commonly dominated by bulrush (*Scirpus* sp.), **cattail** (*Typha latifolia* and *T. angustifolia*), **common reed** (*Phragmites australis*), and **Johnsongrass**. **Sandbar willow** dominates in areas where shrubs occur (refer to Valley Foothill Riparian, above).

The hydrology of these ditches is not solely irrigation runoff. The ditches drain agricultural fields that are predominantly below sea level. All ditches within the project area are likely to be jurisdictional wetlands on the basis of either being built in hydric soils and/or directing surface hydrology links to navigable waters (e.g., tidal sloughs).

Seasonal Wetland

One seasonal wetland was identified northeast of the proposed intake facility site. The wetland occurs in a depression at the toe of the levee, and is dominated by **arroyo willow** (*Salix lasiolepis*), **Himalayan blackberry** (*Rubus discolor*) and **Bermuda grass** (*Cynodon dactylon*). The site is heavily disturbed with historically-deposited fill material, including large chunks of concrete and rebar. Vegetation has colonized the fill material, resulting in a highly uneven topography. The wetland's hydrology is most likely derived in part by subsurface seepage under the adjacent levee, since the site is below sea level. The wetland is also located along a ditch system at the base of the levee; therefore, the hydrology is likely provided by both surface and groundwater sources.

Valley Foothill Riparian

Riparian habitats are vegetated corridors along stream and river banks. A small amount of riparian habitat vegetated with shrubs and/or trees occurs in the project area, with scattered distribution along larger agricultural and drainage ditches including Pixley Slough. Riparian habitat in the project area generally occurs in narrow bands remaining close to channel margins, and is composed of a shrub-dominated overstory with herbaceous understory. Dominant plant species observed in this community include **sandbar willow** (*Salix exigua*), **Fremont's cottonwood** (*Populus fremontii*), **Johnsongrass** (*Sorghum halepense*), **willow-herb** (*Epilobium* sp.) and **fennel** (*Foeniculum vulgare*). Channel margins of larger waterbodies in the project area, including Little Connection Slough, Honker Cut and Bishop Cut, are rip-rapped and do not support vegetated riparian corridors.

Riparian corridors are important wildlife areas that provide important nesting habitat for migratory songbirds such as warblers, vireos, grosbeaks, and flycatchers. Riparian areas also provide foraging habitat for many species of reptiles and amphibians and act as migration and movement corridors for many wildlife species. The canopy and sub-canopy layers provide shade and protection of the water features and their aquatic inhabitants. Many fish inhabiting the waterways of riparian habitats require the shade of streamside vegetation and undercut banks.

Riverine

Riverine habitat includes larger open water channels with water depths greater than two meters (approximately 6.5 feet) beyond the depth of rooted emergent vegetation. Within the project area, this includes: San Joaquin River, Little Connection Slough, Honker Cut, Bishop Cut, Pixley Slough, and Bear Creek. Riverine habitat and associated fish and aquatic species are noted in this section and discussed in detail in Chapter 4, Delta Water Resources and Fisheries.

Urban

Urban land uses in the project area are primarily clustered along Eight Mile Road from just west of I-5 and east of Davis Road. Existing development consists primarily of residential land use and two golf courses. Active development is currently underway for new commercial property (e.g., immediately west of I-5) and residential areas. Scattered development, particularly in the western portion of the project area, includes a marina and rural residences. For the purpose of this document, roadways throughout the project area are considered urban development.

Urban land use components such as buildings and domestic landscaping provide habitat for some wildlife species. For example, common birds such as **house finch** (*Carpodacus mexicanus*) build their nests on structures, and less abundant species like **black phoebe** (*Sayornis nigricans*), **cliff swallow** (*Hirundo pyrrhonota*), and barn swallow (*Hirundo rustica*), also use buildings, especially near water. The golf course has typical golf-course features, especially large open spaces with lawn and landscaped trees, and some constructed water features. Common wildlife such as **killdeer**, American robin (*Turdus migratorius*), and American pipit (*Anthus rubescens*) are likely to use golf courses. Ruderal vegetation such as introduced grasses and weeds often develops on abandoned parcels and untended spaces between parcels.

Vegetative Communities and Wildlife Habitats within Project Area

Intake Facilities

The proposed intake site would be located on the southwest corner of Empire Tract adjacent to riverine habitat (San Joaquin River). The terrestrial portion of the intake site provides minimal habitat, consisting of the terminus and turn-around of Empire Tract Road and rip-rapped channel banks. East of the road, the site is heavily disturbed (ruderal – see urban habitat description above) with historical fill material, including concrete and rebar. A wetland ditch and associated seasonal wetland occur just northeast and outside of the proposed intake site. Irrigated cropland occurs adjacent to the proposed intake site.

Raw and Treated Water Pipelines

Except for special crossings, project pipelines would be installed using open cut trenching in most areas. The proposed raw and treated water pipelines alignments are located along the margins of cropland and irrigated hayfields or roadways and urban land uses. Drainage canals and irrigation ditches are located parallel and perpendicular to Eight Mile Road along a substantial portion of the raw water pipeline alignment and south of the road. The raw water pipelines have been sited north of Eight Mile Road to avoid impacts to the larger drainage ditches located along the south side of the road. These ditches are designated as fresh emergent wetlands, and patches of valley foothill riparian habitat are supported along the larger ditches along the alignment.

The raw water pipeline north of Eight Mile Road would be tunneled under riverine habitats at Honker Cut and Bishop Cut using trenchless construction techniques (e.g., microtunneling, jack and bore, etc.). Rip-rap lines the channel margins of Honker and Bishop Cuts. None of the slough crossing locations support adjacent wetlands or well-developed valley foothill riparian habitat. Pixley Slough would not be crossed by the raw water pipeline alignment. Well-developed riparian vegetation occurs along Pixley Slough south of Eight Mile Road and east of Davis Road. However, the pipeline alignment is proposed north of Eight Mile Road in an agricultural area. Levee roads and agriculture occur in adjacent upland areas.

The treated water pipeline would be tunneled under Pixley Slough at Eight Mile Road using trenchless construction techniques. In addition, Bear Creek at West Lane south of Eight Mile Road would also be tunneled under using trenchless construction methods. Both of these crossings lack foothill riparian habitat.

Water Treatment Plant

The 126-acre parcel containing the 56-acre WTP site is currently planted in alfalfa (irrigated hayfields and cropland community). A wetland ditch occurs along its northern perimeter. At this time, the City plans to keep the remaining 70 acres in agricultural use.

Special-Status Species

Special-status species are plants and animals that, because of their rarity or vulnerability to various causes of habitat loss or population decline, are recognized in some fashion by federal, state, or other agencies as deserving special consideration. Some of these species receive specific legal protection pursuant to federal and/or state endangered species legislation. Others lack such legal protection, but have been characterized as "sensitive" on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this report. The various categories encompassed by the term, and the legal status of each, are discussed later in this report under the "Regulatory Considerations."

Special-Status Species within the Project Area

A list of special-status plant and animal species with potential to occur within the vicinity of the proposed DWSP was compiled based on data from CDFG (2004a, 2004b, 2004c), CNPS (2004), and USFWS (USFWS, 2004). This list and the potential for each species to occur are presented in Appendix C. The "Potential for Occurrence" categories can be generally defined as follows:

- **Unlikely:** The project activities would not impact suitable habitat for the species.
- **Low Potential:** Project area only provides very limited, disturbed, and/or isolated habitat for the species. The species is not likely to use the available habitat.
- **Medium Potential:** The project activities may impact potentially occupied habitat for the species, including dispersal and foraging habitat.
- **High Potential:** The project activities may impact known occupied habitat, critical habitat (as defined by the Endangered Species Act), or otherwise recognized as high value habitat for the species.

Of the species listed in Appendix C, several special-status species have the potential to be affected by the DWSP, based on a reconnaissance-level assessment and a review of the reference materials described at the beginning of this section. Special-status species with a medium to high potential to be affected, and species listed under the Federal or California Endangered Species Acts that have a low potential to be affected by the DWSP are presented in Table 3.5-2. These species are discussed in more detail following the table. Fisheries resources are discussed in detail in Chapter 4, Delta Water Resources and Fisheries.

TABLE 3.5-2
SPECIAL-STATUS WILDLIFE AND PLANT SPECIES

Common name (*Scientific name*)	Listing Status USFWS/ CDFG/CNPS	SJMSCP Covered Species	Habitat and Range	Potential to Occur	Rationale
FEDERAL AND STATE LISTED SPECIES					
Reptiles					
Giant garter snake *(Thamnophis couchi gigas)*	FT/ST/--	Yes	Marshes, streams, and sloughs of the Central Valley.	Medium	Wetland ditches, other perennial wetland habitats, and adjacent uplands (for winter estivation) in project area. Species recorded within pipeline alignment in 1980 and within five miles of project area in 1996.
Birds					
Swainson's hawk *(Buteo swainsoni)*	FSC/ST/--	Yes	Breeds in trees and large shrubs in riparian areas and oak savannah adjacent to foraging areas, e.g., grasslands, alfalfa, and grain fields that support rodent populations.	High	At least one active nest in pipeline alignment within last four years; numerous records within five miles of project area.
Greater sandhill crane *(Grus canadensis tabida)*	--/ST/--	Yes	Open habitats, shallow lakes, and emergent wetlands. In winter also uses dry grasslands and croplands near wetlands.	Medium	Project area provides winter foraging habitat, but is outside of breeding range.
CANDIDATE AND OTHER SPECIAL-STATUS SPECIES					
Reptiles					
Western pond turtle *(Emys marmorata)*	FSC/CSC/--	Yes	Rivers and streams, especially with some canopy cover and basking sites.	Medium	Project area provides suitable habitat. Species recorded within 0.3 miles of pipeline alignment.
Birds					
Aleutian Canada goose *(Branta canadensis leucopareia)*	FD/--/--	Yes	Winter resident in the Central Valley. Grazes in open fields near water.	Medium	Agricultural fields within project area provide potential habitat.
Mountain plover *(Charadrius montanus)*	FSC/CSC/--	Yes	Winters in central California on bare dirt fields and short grasslands. No nesting records in California.	Medium	Project area provides potential foraging habitat within species' winter range.

TABLE 3.5-2 (Continued)
SPECIAL-STATUS WILDLIFE AND PLANT SPECIES

Common name (*Scientific name*)	Listing Status USFWS/ CDFG/CNPS	SJMSCP Covered Species	Habitat and Range	Potential for Occurrence	Rationale
White-tailed kite (*Elanus leucurus*)	FSC/SFP/--	Yes	Forages in open plains, farmland, grasslands, and prairies; typically nests in trees.	Medium	Species may nest in vicinity of project.
Loggerhead shrike (*Lanius ludovicianus*)	--/CSC/--	Yes	Nests in dense shrubs and brush near open foraging areas such as grasslands.	Medium	Species may nest and forage in project area.
Western burrowing owl (*Speotyto hypugea cunicularia*)	FSC/CSC/--	Yes	Open, dry annual or perennial grasslands and scrublands characterized by low-growing vegetation. Subterranean nester dependent upon burrowing mammals, specifically California ground squirrel.	Medium	Species recorded breeding <1.3 miles south of pipeline alignment. Potentially suitable breeding habitat in eastern portion of project area.
Plants					
Suisun marsh aster (*Aster lentus*)	--/--/List 1B	Yes	Brackish and freshwater marshes.	High	Potentially suitable habitat. Especially likely to occur in tidally-influenced areas. Species recorded <0.25 miles from raw water pipeline alignment in 2000.
Rose mallow (***Hibiscus lasiocarpus***)	--/--/List 2	Yes	Associated with freshwater marshes	High	Potentially suitable habitat. Especially likely to occur in tidally-influenced areas. Species recorded within 0.3 miles of project area.
Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)	--/--/List 1B	Yes	Both tidal freshwater and brackish marshes in Central and San Joaquin Valleys and in San Francisco Bay area.	High	Potentially suitable habitat. Especially likely to occur in tidally-influenced areas. Species recorded within 5 miles of project area.
Mason's lilaeopsis (*Lilaeopsis masonii*)	--/SR/List 1B	Yes	Brackish or freshwater marshes, stream bank scrub. Only known to island systems of the Delta.	High	Potentially suitable habitat. Especially likely to occur in tidally-influenced areas. Species recorded <2 miles from raw water pipeline alignment.
Delta mudwort (*Limosella subulata*)	--/--/2	Yes	Generally occurs under wet conditions in tidal freshwater-marsh habitats, 0–9 feet in elevation.	High	Potentially suitable habitat; especially likely to occur in tidally-influenced areas. Species recorded approx. 2 miles from raw water pipeline alignment.

TABLE 3.5-2 (Continued)
SPECIAL-STATUS WILDLIFE AND PLANT SPECIES

Common name (*Scientific name*)	Listing Status USFWS/ CDFG/CNPS	SJMSCP Covered Species	Habitat and Range	Potential for Occurrence	Rationale
Eel-grass pondweed *(Potamogeton zosteriformis)*	--/--/2	No	Marshy freshwater habitats from 0–1,860 meters.	Medium	Potentially suitable habitat. Species recorded within 5 miles of project area.
Sanford's arrowhead *(Sagittaria sanfordii)*	--/--/List 1B	Yes	Assorted shallow, freshwater habitat.	Medium	Potentially suitable habitat.
Marsh skullcap (*Scutellaria galericulata)*	--/--/2	No	Wet meadow and marsh habitats.	Medium	Potentially suitable habitat. Species recorded from within five miles of pipeline alignment.
Blue skullcap (*Scutellaria lateriflora)*	--/--/2	Yes	Wet meadow and marsh habitats.	Medium	Potentially suitable habitat. Species recorded from vicinity of pipeline alignment.

STATUS CODES
Federal
FT = Federal Threatened.
FC = Federal Candidate.
FSC = Federal Species of Concern.
FD = Federal Delisted.

State
ST = State Threatened.
SR = State Rare.
SFP = State Fully Protected.
CSC = California Species of Special Concern.

California Native Plant Society
List 1B = Plants rare, threatened, or endangered in California and elsewhere.
List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere.

Giant garter snake (*Thamnophis gigas*)
Federal and State – Threatened

The giant garter snake is one of the largest garter snakes of the genus *Thamnophis*, with a total length up to 4.5 feet or greater. Habitat types utilized by giant garter snakes include freshwater marsh, flooded rice fields, and drainage canals. During their active season giant garter snakes are usually found within a few feet of water, often between the water level and the top of adjacent banks. Winter retreats utilized by the giant garter snake include small mammal burrows and man-made structures such as piles of large rocks or riprap. Adult and juvenile snakes emerge from their winter retreats in late March or early April. They are active from the time of emergence to the end of October with surface activity concentrated from April to July.

Swainson's hawk (*Buteo swainsoni*)
State – Threatened

The Swainson's hawk is a long-distance migrant species. The Central Valley population winters primarily in Mexico and arrives on their breeding grounds in the Central Valley in mid-March to early April. Nests are generally found in scattered trees or large shrubs, often along riparian systems adjacent to agricultural fields or pastures. Egg laying generally occurs in April, and young are present during May to 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 depart in the fall for migration. Migration to wintering grounds generally occurs around September. Some individuals or small groups may winter in California.

Greater sandhill crane (*Grus canadensis tabia*)
State – Threatened

Greater sandhill cranes winter in the region of the project area. In winter they forage in grasslands and agricultural grain fields, and may roost in fields or meadows in which they feed. Other food items include grass shoots, worms, insects, aquatic invertebrates, and small reptiles, amphibians, and rodents. The agricultural land in the project area may provide foraging habitat for this species. Since the species is highly mobile, threats primarily include loss of foraging habitat.

Western pond turtle (Cle*mmys marmorata*)
Federal – Species of Concern; State – Special Concern

The western pond turtle is most commonly found in ponds, marshes, creeks, and irrigation ditches. This species frequently basks on logs or other objects out of the water when water temperatures are low and air temperatures are greater than water temperatures. Mating typically occurs in late April or early May, but may occur year-round. Nests are located in upland locations that may be a considerable distance (up to 0.25 mile) from an aquatic site. Hatchling turtles are thought to emerge from the nest and move to aquatic sites in the spring. This species may occur in the vicinity of sloughs, channels, and canals in the DWSP area.

Aleutian Canada goose (*Branta canadensis leucopareia*)
Federal – Delisted

This species breeds on the Aleutian Islands off the coast of southwest Alaska. In winter they frequent agricultural fields in California's Central Valley, where they graze on young vegetation. Much of the population can winter at the San Joaquin River National Wildlife Refuge in Stanislaus County although they may occur throughout much of the Central Valley.

Mountain plover (*Charadrius montanus*)
Federal – Special Concern; State – Special Concern

In California's Central Valley, mountain plovers are a winter visitor from September to March. They frequent open grasslands and agricultural fields with no or low-growing vegetation, where they forage primarily on insects. They generally form flocks in winter, and may flock with other species such as black-bellied plover (*Pluvialis squatarola*). The project area provides potentially suitable foraging habitat for the species.

White-tailed kite *(Elanus leucurus)*
Federal – Special Concern; State – Fully Protected

White tailed kites are year-round residents in central California. They typically nest in oak woodlands or trees, especially along marsh or river margins, and they may use any suitable tree or shrub that is of moderate height. Their nesting season may begin as early as February and extends into August. During daylight hours kites forage for rodents in wet or dry grasslands and fields.

Loggerhead shrike *(Lanius ludovicianus)*
Federal – Special Concern; State – Special Concern

Loggerhead shrikes are a common year-round resident of lowlands in central California. They nest in dense foliage of shrubs and trees, and forage in open habitats for insects and small vertebrates. While they infrequently occur in developed areas, they may nest and forage in croplands and grasslands.

Western burrowing owl (*Athene cunicularia*)
State – Special Concern

In California's Central Valley, the burrowing owl is a year-round resident of open spaces, e.g., grasslands and agricultural fields. Nests are generally found in the abandoned burrows of small mammals such as ground squirrels. However, they dig their own burrows in soft soil, and occasionally use culverts and other man-made structures. Breeding peaks from April to May, but can occur from March to August. Burrowing owls forage on insects and small mammals, and may also consume reptiles, birds, and carrion. Threats to the population include habitat destruction (e.g., conversion of grasslands and agricultural fields to other uses) and the poisoning of ground squirrels. Open grassland in the DWSP area represents potential habitat for burrowing owls, especially in areas with a low frequency of disturbance.

Suisun Marsh aster (*Aster lentus*)
Federal – Special Concern; State/CNPS – --/1B

The Suisun Marsh aster, a perennial herb in the sunflower family (*Asteraceae*), occurs at the edge of freshwater and brackish, tidally influenced water, and generally under natural conditions.

Rose-mallow (*Hibiscus lasiocarpus*)
State/CNPS – --/2

The rose mallow, a perennial herb in the mallow family (*Malvaceae*), is a wide-ranging species in the Central Valley with small populations composed of one to a few plants. It occurs along waterways of the Delta.

Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)
Federal – Special Concern; State/CNPS – --/1B

The Delta tule pea, a perennial herb in the pea family (*Fabaceae*), generally occurs under natural conditions along the edges of brackish and freshwater habitats in the Delta.

Mason's lilaeopsis (*Lilaeopsis masonii*)
Federal – Special Concern; State/CNPS – CR/1B

Mason's lilaeopsis, a small perennial herb in the celery family (*Apiaceae*), occurs under natural conditions in peaty or clay soils in riparian, freshwater, and brackish marshes in the Delta.

Delta mudwort (*Limosella subulata*)
State/CNPS – --/2

Delta mudwort, an annual herb in the snapdragon family (*Scrophulariaceae*), generally occurs in muddy or sandy intertidal habitats in the Delta, almost always under natural conditions.

Eel-grass pondweed (*Potamogeton zosteriformis*)
State/CNPS – --/2

Eel-grass pondweed, an annual aquatic herb of the pondweed family (*Potamogetonaceae*), generally occurs in lakes, ponds, and slow streams.

Sanford's arrowhead (*Sagittaria sanfordii*)
Federal – Special Concern; State/CNPS – --/1B

Sanford's arrowhead, a perennial herb of the arrowroot family (*Alismataceae*), is an emergent plant that usually occurs under natural conditions in shallow, slow moving water. However, it is occasionally found in man-made channels.

Marsh skullcap (*Scutellaria galericulata*)
State/CNPS – --/2

Marsh's skullcap, a perennial rhizomatous herb in the mint family (*Lamiaceae*), occurs in meadow and freshwater marshes, and sometimes in moist conditions in coniferous habitats. The species blooms from June to September.

Blue skullcap (*Scutellaria lateriflora*)
State/CNPS – --/2

Blue skullcap, a perennial herb in the mint family (*Lamiaceae*), occurs in meadow and freshwater marshes, and sometimes in moist conditions in non-wetland habitats. It may be extirpated from San Joaquin County.

REGULATORY SETTING

Federal

Endangered Species Act

Under the Federal Endangered Species Act (ESA), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 United States Code [USC] 1533[c]). Pursuant to the requirements of ESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federal-listed threatened or endangered species could be present in the project area and determine whether the proposed project would have a potentially significant impact on such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under ESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]).

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 ESA. The candidate species are taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened.

Clean Water Act (Section 404)

The Corps regulates activities in wetlands and other "waters of the U.S." through the Clean Water Act. Wetlands are ecologically productive habitats that support a rich variety of both plant and animal life. The importance and sensitivity of wetlands has increased as a result of a growing understanding of their function as recharge areas and filters for water supplies. Following is the federal definition of a wetland.

Wetlands are a subset of "waters of the United States" and receive protection under Section 404 of the Clean Water Act. The term "waters of the United States" defined in the Code of Federal Regulations (CFR) (33 CFR 328.3[a]; 40 CFR 230.3[s]) includes:

1. All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide.

2. All interstate waters including interstate wetlands. (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.)

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters[1]:

    - which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    - from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    - that are used or could be used for industrial purposes by industries in interstate commerce.

4. All impoundments of waters otherwise defined as waters of the United States under the definition.

5. Tributaries of waters identified in paragraphs (1) through (4).

6. Territorial seas.

7. Wetlands adjacent to waters identified in paragraphs (1) through (6).

8. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding the Clean Water Act jurisdiction remains with EPA (328.3[a][8] added 58 FR 45035, Aug. 25, 1993).

Regulated wetlands and other waters of the United States are subject to jurisdiction under Section 404 of the Clean Water Act. Wet areas that are not regulated include stock watering ponds and created water quality treatment facilities.

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[1] Since the Solid Waste Agency of Northern Cook County (SWANCC) v. United States Army Corps of Engineers decision, 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 the Clean Water Act 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: Corps jurisdiction over 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).

State

California Endangered Species Act

The CDFG administers the California Endangered Species Act of 1984 (California Fish and Game Code Section 2050 et seq.), which regulates the listing and "take" of endangered and threatened species. A "take" of such a species may be permitted by CDFG through issuance of permits pursuant to Fish and Game Code section 2081.

Prior to enactment of the California Endangered Species Act, the designation of "Fully Protected" was used by CDFG 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 (§§ 3503.5, 3505, 3511, 3513, 4700, 4800, 5050, and 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 that is given to 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 CDFG, "fully protected species" actually enjoy a greater level of legal protection than "listed" species.

CDFG maintains lists for candidate endangered and threatened species. California candidate species are afforded the same level of protection as listed species. California also designates species of special concern, 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 'species of special concern' list is intended by CDFG as a management tool for consideration in future land use decisions.

Streambed Alteration Agreement

The state's authority in regulating activities in "waters of the U.S." resides primarily with the CDFG and the SWRCB. CDFG provides comments on Corps permit actions under the Fish and Wildlife Coordination Act. CDFG is also authorized under the California Fish and Game Code Sections 1600–1607 to develop mitigation measures and enter into 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.

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA *Guidelines* Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in federal ESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the guidelines primarily to address situations in which a public agency is reviewing a project that could have a significant effect on, for example, a "candidate species" that has not yet been listed by either the USFWS or CDFG.

Local

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

The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) (San Joaquin Council of Governments, 2000) provides a strategy for balancing the need to conserve open space and the need to convert open space to non-open space use while providing for the long-term management of plant, fish and wildlife species, especially those that are currently listed, or may be listed in the future, under the federal or state ESA. The SJMSCP is a 50-year plan and will be in effect until the year 2049. The SJMSCP is implemented by a Joint Powers Authority (JPA). The JPA is responsible for conducting all required preconstruction surveys, informing an applicant of "Incidental Take" minimization measures, confirming that "Incidental Take" minimization measures have been implemented prior to site-disturbance, and collecting development fees. Development fees are determined by the type and area of habitat converted to development.

Participation in the SJMSCP is voluntary for local jurisdictions and independent project proponents, and allows a participant to conduct permitted activities that result in or may result in "Incidental Take" of listed species covered by the SJMSCP. Participation in the SJMSCP may facilitate or expedite the approval of development projects since participants would avoid having to obtain required permits separately or authorizations directly from the regulating agencies. The JPA has obtained permits and authorizations for the conversion of a predetermined amount of open space habitat to development. These permits and authorization would cover a participant in the SJMSCP.

Certain land uses, such as the proposed DWSP, were not included in mapped land uses in the SJMSCP. Because the proposed DWSP is not a mapped land use under the SJMSCP, it is therefore not covered under the SJMSCP. Furthermore, neither the diversion nor the conveyance of water is covered by the SJMSCP. Coverage for these land uses is subject to a case-by-case review by the JPA's Technical Advisory Committee (TAC) to ensure that the biological impacts of proposed projects fall within the parameters established by the SJMSCP.

Project proponents not otherwise subject to the SJMSCP may participate in the SJMSCP upon making a request to the JPA. The JPA may approve such requests with the concurrence of the Permitting Agencies' representatives on the TAC. Approval of such requests is contingent upon the JPA finding that sufficient Incidental Take acres remain and that mitigation pursuant to the SJMSCP is appropriate for the impacts on the species covered by the SJMSCP. The City would request such approval for the proposed DWSP pipelines and WTP. The City will process separate ESA compliance for the intake facility construction and operation.

San Joaquin County Tree Preservation

The San Joaquin County General Plan recognizes riparian areas, significant oak groves, and heritage oak trees (oaks with a 32-inch diameter measured at a height of 4.5 feet) as resources of significant biological and ecological importance in San Joaquin County, and includes provisions to protect these resources. Additional provisions protect riparian habitat. According to the 1992 San Joaquin General Plan, riparian habitat must be retained or replaced, riparian woodlands may not be removed, significant oak groves must be retained, and heritage trees must be protected. In the event that tree resources are impacted by a project, the type, quantity, and timing of planting of replacement trees or riparian vegetation is described.

City of Stockton Tree Preservation

Heritage trees are protected under the City‘s Municipal Code. Heritage trees are defined as any valley oak, coast live oak, and interior live oak trees which are located on public or private property, and which have a trunk diameter of sixteen inches or more, measured at twenty-four inches above actual grade. Trees meeting this definition may occur within the treated water pipeline alignment south of Eight Mile Road (i.e., within the City limits).

Other Statutes, Codes, and Policies Affording Limited Species Protection

The Federal Migratory Bird Treaty Act (16 U.S.C., Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Birds of Prey are protected under the California Fish and Game Code (Section 3503.5), which states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “taking” by the CDFG.

The Federal Bald Eagle Protection Act prohibits persons within the United States (or places subject to U.S. jurisdiction) from “possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof.”

Vascular plants listed as rare or endangered by the CNPS (Skinner and Pavlik, 1995), but which have no designated status or protection under federal or state endangered species legislation, are defined as follows:

List 1A Plants Believed Extinct.

List 1B Plants Rare, Threatened, or Endangered in California and elsewhere.

List 2 Plants Rare, Threatened, or Endangered in California, but more numerous elsewhere.

List 3 Plants About Which We Need More Information – A Review List.

List 4 Plants of Limited Distribution – A Watch List.

In general, plants appearing on CNPS List 1B and List 2 are considered to meet CEQA's Section 15380 criteria and effects to these species are considered "significant" in this EIR.

3.5.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Based on Section 15065 and Appendix G of the CEQA *Guidelines*, the DWSP would result in a significant impact on the environment if it 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 CDFG or USFWS;
- Have a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFG or USFWS;
- Have a substantial adverse effect on federal-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 wildlife species or with established native resident or migratory native wildlife corridors, or impede the use of wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan;
- Substantially reduce the habitat of a fish and wildlife species;
- Cause wildlife population to drop below self-sustaining levels;
- Threaten to eliminate a plant or animal community; or
- Reduce the number or restrict the range of an endangered, rare or threatened species.

CEQA Section 15380 provides that a plant or animal species may be treated as “rare or endangered” even if it does not occur on one of the official lists if, for example, it is likely to become endangered in the foreseeable future. As species of plants and animals become restricted in range and limited in population numbers, species may become listed or candidates for listing as endangered or threatened and become recognized under CEQA as a significant resource. Examples of such species are vernal pool fairy shrimp (listed by USFWS) and burrowing owl (California Species of Special Concern).

METHODOLOGY

The impact analysis focuses on foreseeable changes to the baseline condition in the context of the significance criteria presented above. Impacts were assessed for the construction and operation of the DWSP facilities.

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

1. Magnitude of the impact (e.g., substantial/not substantial);
2. Uniqueness of the affected resource (i.e., rarity of the resource); and
3. 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 of impact to a federal- or state-listed species would be considered significant if the species were 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 result in a significant impact.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.5-3 provides a summary of the significant and less than significant impacts to biological resources associated with specific components of the DWSP.

IMPACT STATEMENTS AND MITIGATION MEASURES

Construction Impacts

Impact BIO-1: Construction of DWSP facilities would result in the loss of jurisdictional waters of the U.S., including wetlands. Less than significant with mitigation for the intake facility. No impact for the raw and treated water pipelines and the WTP.

Intake Facility

Construction of either intake configuration would involve limited dredging of material in the San Joaquin River and adjacent levee, and placement of fill including concrete and riprap. The estimated quantity of material for each configuration is presented in Table 2-5 in Chapter 2, Project Description. The amount of fill that would be placed in the San Joaquin River for both types of intake configurations is shown in Table 3.5-4.

TABLE 3.5-3
SUMMARY OF IMPACTS – BIOLOGICAL RESOURCES
(EXCLUDES FISHERIES RESOURCES)

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
BIO-1: Construction of DWSP facilities would result in the loss of jurisdictional waters of the U.S., including wetlands.	LSM	LSM	NI	NI	NI
BIO-2: Construction of DWSP facilities could result in impacts to special-status species.	LSM	LSM	LSM	LSM	LSM
BIO-3: Construction of the proposed DWSP raw and treated water pipelines could result in temporary impacts to riparian habitats or other sensitive natural communities.	NI	NI	LSM	NI	LSM
BIO-4: Construction of the proposed DWSP raw and treated water pipelines could impact native wildlife migration corridors or nursery sites.	NI	NI	LSM	NI	LSM
BIO-5: The proposed DWSP could conflict with adopted City and County tree preservation ordinances.	NI	NI	LSM	LSM	LSM
BIO-6: The proposed DWSP could conflict with the SJMSCP.	NI	NI	NI	NI	NI

LSM = Less than Significant Impact with Mitigation
LS = Less than Significant Impact
NI = No Impact

TABLE 3.5-4
ESTIMATED AMOUNT OF FILL PLACED IN SAN JOAQUIN RIVER BY INTAKE CONSTRUCTION

Intake Configuration	Fill Material	Estimated Area (acres)
In-River Intake	Concrete Structure	0.127
	Concrete and Riprap	0.137
	Riprap	0.053
	TOTAL	**0.317**
In-Bank Intake	Concrete Structure	0.128
	Riprap	0.172
	Imported Material (soil)	0.144
	TOTAL	**0.444**

The maximum anticipated impact to jurisdictional waters of the U.S. would be less than 0.5 acres. Any permanent loss of waters of the U.S. would require a Department of the Army permit from the Corps for compliance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. In addition, the CVRWQCB regulates these features under Section 401 of the Clean Water Act. Lastly, alteration to the Sacramento River would require entering into a Streambed Alternation Agreement with CDFG as required under Section 1601 of the State Fish and Game Code. Implementation of Mitigation Measure BIO-1 would reduce the loss of waters of the U.S. to less than significant.

On the land-side of the levee, no fill would be placed in wetlands or other waters of the U.S. A wetland ditch and seasonal wetland are located along the toe of the existing levee just outside of the proposed intake site (Figures 2-11a, 2-11b, 2-12a, and 2-12b). Both the ditch and wetland, which are jurisdictional wetlands under Clean Water Act Section 404, would be avoided by construction of the proposed intake facility. Implementation of Mitigation Measure GEO-1 would ensure that sediment would not be carried by storm water runoff into these wetlands.

Raw and Treated Water Pipelines

As described in Chapter 2, Project Description, the raw water pipeline construction corridor was assumed to be a maximum of 80 feet wide, and the treated water pipeline corridor was assumed to be located within a 100-foot area to either side of road centerlines for the purposes of the wetland delineation. Based strictly on analysis of these corridors, a maximum potential wetland impact area was calculated. The actual impact area would be substantially less as project design continues to be refined.

Pipeline installation would minimize impacts to sensitive wetland and aquatic resources by utilization of trenchless construction methods to tunnel under sloughs and major ditches. Minor ditch crossings (i.e., water surface less than 15 feet wide) would be temporarily dammed to install the pipe using open cut trenching, and then restored after completion of the crossing to its previous condition.

There are 7.1 acres of jurisdictional wetland that occur within the identified raw and treated pipeline construction corridor. However, by avoiding and minimizing wetland impacts, the construction of the pipelines would not result in the loss of any jurisdictional wetlands. The raw and treated water pipelines would be constructed within or along roadways and agricultural lands to the maximum extent possible. In order to minimize impacts to both sloughs and jurisdictional wetlands, including larger agricultural drainage ditches, trenchless construction techniques (e.g., microtunneling, jack and bore, etc.) would be used for crossing the 25-foot wide agricultural ditch located south of Eight Mile Road near the intersection of Eight Mile Road and Empire Tract Road, Bishop Cut, Honker Cut, Pixley Slough, and Bear Creek. Open trench construction would be utilized for crossing of minor wetland drainages (less than 15 feet wide), which would be temporarily dammed to install the pipelines. Restoration of temporary disturbance to these wetland ditches would be performed after work completion. Therefore, this would be a less than significant impact with implementation of Mitigation Measure BIO-1b.

Water Treatment Plant

The WTP would be constructed in an agricultural (alfalfa) field. A jurisdictional wetland ditch occurs along the northern boundary of the 126-acre parcel. This wetland ditch would be avoided during construction of both site access and the WTP. Therefore, there would be no impact.

Mitigation Measure BIO-1**:** Prior to construction, the City shall obtain and comply with federal and state permit requirements pertaining to impacts on waters of the U.S. and of the State. The City shall coordinate with the Corps to obtain a permit under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, and with the CVRWQCB to obtain Section 401 water quality certification. The City also shall coordinate with CDFG to obtain a Section 1600 streambed alteration agreement. Terms of these permits and agreements could include additional provisions.

Where open trench construction and excavation is employed at drainage crossings, the following measures shall be implemented:

- Implement Mitigation Measure GEO-1 to reduce indirect impacts to wetlands during open trench construction.
- Conduct all trenching and construction activities across drainages and seasonal wetlands during low-flow or dry periods;
- Place sediment curtains upstream and downstream of the construction zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone;
- Locate spoil sites such that they do not drain directly into the drainages and/or seasonal wetlands;

- Store equipment and materials away from the drainages and wetland areas. No debris will be deposited within 25 feet of the drainages and wetland areas;
- Return an impacted wetland to original grade following pipeline installation. Any wetland area left bare following construction will be revegetated using hydroseed and/or plugs of native vegetation matching the species composition of adjacent wetland areas.

Significance After Mitigation: Less than significant.

Impact BIO-2: Construction of DWSP facilities could result in impacts to the following special-status species: giant garter snake, Swainson's hawk, western pond turtle, white-tailed kite, other nesting raptors, loggerhead shrike, western burrowing owl, Suisun marsh aster, rose mallow, Delta tule pea, Mason's lilaeopsis, Delta mudwort, eel-grass pondweed, Sanford's arrowhead, marsh skullcap, and blue skullcap. Less than significant with mitigation for all DWSP facilities.

Some special-status species that may use the project area during their non-breeding season are highly mobile and would only be affected by conversion of substantial amounts of foraging habitat. These species include greater sandhill crane, Aleutian Canada goose, and mountain plover. The DWSP would convert approximately 56 acres of agricultural land to non-agricultural uses for the WTP. Given the large amount of similar agricultural land in the vicinity of the project, the loss of 56 acres would not be a substantial loss and the impact would be less than significant to greater sandhill crane, Aleutian Canada goose, and mountain plover. Therefore these species are not considered further in this section.

Intake Facility

Construction of either the in-bank or in-river intake would include habitat modifications within the San Joaquin River, on a levee bank armored with rip-rap, and at an agricultural ditch and seasonal wetland behind the levee. Construction within and permanent loss of portions of the ditch and wetland would impact giant garter snake, western pond turtle, Suisun marsh aster, rose mallow, Delta tule pea, Mason's lilaeopsis, Delta mudwort, eel-grass pondweed, Sanford's arrowhead, marsh skullcap, and blue skullcap. Upland habitat for giant garter snake (i.e., uplands within 200 feet of an aquatic habitat) would also be affected. Impacts would result from direct mortality of these species during construction, and from loss of habitat for the federal-listed giant garter snake. These impacts would be potentially significant. Operation of the intake facility is not expected to further impact these species.

Raw and Treated Water Pipelines

The raw and treated water pipelines would be constructed along and under roadways and agricultural lands from the intake facility to the WTP and then to the City's existing distribution system. In order to minimize impacts to sloughs and wetland ditches, trenchless construction techniques (e.g., microtunneling, jack and bore) would be used to cross the intersection of Empire

Tract Road and Eight Mile Road, Bishop Cut, Honker Cut, Pixley Slough, and Bear Creek. Open cut trenching would be used at several smaller wetland ditch crossings (less than 15 feet in width). The pipelines would be located entirely underground and the surface would be returned to pre-project grade and contours. Construction of the pipelines would result in direct impacts to giant garter snake, Swainson's hawk, western pond turtle, white-tailed kite, other nesting raptors, loggerhead shrike, western burrowing owl, Suisun marsh aster, rose mallow, Delta tule pea, Mason's lilaeopsis, Delta mudwort, eel-grass pondweed, Sanford's arrowhead, marsh skullcap, and blue skullcap. Impacts would result from direct mortality of these species during construction, and from the temporary loss of habitat for the federal-listed giant garter snake. Although direct impacts would be minimized with the use of trenchless construction techniques, under some circumstances (e.g., hydrofracture during drilling operations) trenchless construction techniques may still impact the resources that they are designed to avoid. Impacts from unanticipated hydrofracture include smothering of aquatic resources and disturbance during cleanup operations. Construction activities associated with the pipelines would potentially result in significant impacts. Operation of the pipelines is not expected to further impact these species.

Water Treatment Plant

The WTP would be constructed in an agricultural (alfalfa) field. The 126-acre parcel containing the 56-acre WTP site has mature trees on the perimeter and near an existing vacant farmhouse located near the center of the parcel. A wetland ditch occurs on the northern boundary of the parcel. Construction of the DWSP would convert approximately 56-acres of the 126-acre parcel to non-agricultural use. The wetland ditch along the northern boundary of the parcel will be avoided both by site access and facility placement. Construction of the DWSP WTP would potentially result in significant impacts to giant garter snake, Swainson's hawk, white-tailed kite, other nesting raptors, loggerhead shrike, and western burrowing owl. Operation of the WTP is not expected to further impact these species.

Mitigation Measure BIO-2a: The City anticipates that the DWSP would be approved for participation in the SJMSCP for land-based facilities (pipelines and WTP). Compliance with the SJMSCP would provide for impact avoidance measures (e.g., pre-construction surveys during appropriate seasons for identification, construction set-backs, restriction on construction timing) and mitigation for loss of habitat for all species that may be affected by this impact, with the exception of eel-grass pondweed and marsh skullcap. Impact avoidance measures would include, but are not limited to, the species-specific measures presented below, which are summarized from the SJMSCP. Complete impact avoidance and habitat compensation measures from the SJMSCP are presented in detail in Appendix D.

<u>Giant Garter Snake</u>

Construction shall occur between May 1 and October 1, which is the active period for the snake. Between October 2 and April 30, additional measures may be necessary to minimize and avoid take. Pre-construction surveys for the giant garter snake (conducted after completion of environmental reviews and prior to ground disturbance) shall occur within 24 hours of ground disturbance. Vegetation clearing and disturbance will be limited to the minimal area necessary within 200 feet of the banks of potential giant garter snake aquatic habitat. On-site construction personnel shall be given instruction regarding the presence of SJMSCP Covered Species and the importance of avoiding impacts to these species and their habitats.

<u>Swainson's Hawk</u>

In order to encourage the retention of known or potential Swainson's hawk nest trees (i.e., trees that hawks are known to have nested in within the past three years or trees, such as large oaks, which the hawks prefer for nesting), for any nest tree that becomes occupied during construction activities, all construction activities shall remain a distance of two times the dripline of the tree, measured from the nest. Alternatively, nest trees may be removed between September 1 and February 15, when the nests are unoccupied.

<u>Western Pond Turtle</u>

When nesting areas for pond turtles are identified on a project site, a buffer area of 300 feet shall be established between the nesting site (which may be immediately adjacent to wetlands or extend up to 400 feet away from wetland areas in uplands) and the wetland located near the nesting site. These buffers shall be indicated by temporary fencing if construction has or will begin before nesting periods end (the period from egg laying to emergence of hatchlings is normally April to November).

<u>White-tailed Kite</u>

For white-tailed kites, preconstruction surveys shall investigate all potential nesting trees on the project site (e.g., especially tree tops 15 to 59 feet above the ground in oak, willow, eucalyptus, cottonwood, or other deciduous trees), during the nesting season (February 15 to September 15) whenever white-tailed kites are noted on site or within the vicinity of the project site during the nesting season.

<u>Loggerhead Shrike</u>

A setback of 100 feet from nesting areas shall be established and maintained during the nesting season for the period encompassing nest building and continuing until fledglings leave nests. This setback applies whenever construction or other ground-disturbing activities must begin during the nesting season in the presence of nests which are known to be occupied. Setbacks shall be marked by brightly colored temporary fencing.

<u>Western Burrowing Owl</u>

Burrowing owls may be discouraged from using the project area by managing vegetation and prey populations. If the project site is an unlikely occupation site for red-legged frogs, San Joaquin kit fox, or tiger salamanders, ground squirrel burrows may be destroyed to discourage occupation by burrowing owls. During the non-breeding season (September 1 through January 31) burrowing owls occupying the project site should be evicted from the project site by passive relocation as described in the CDFG's Staff Report on Burrowing Owls (CDFG, 1995). During the breeding season (February 1 through August 31) occupied burrows shall not be disturbed and shall be provided with a 75 meter protective buffer until and unless the TAC, with the concurrence of the Permitting Agencies' representatives on the TAC; or unless a qualified biologist approved by the Permitting Agencies verifies through non-invasive means that either: (1) the birds have not begun egg laying, or (2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. Once the fledglings are capable of independent survival, the burrow can be destroyed.

Sanford's Arrowhead

Any populations of this species which occur in the project area will be completely avoided.

Suisun Marsh Aster, Rose Mallow, Delta Tule Pea, Mason's Lilaeopsis, Delta Mudwort, and Blue Skullcap

If the plant population is considered healthy by the JPA with the concurrence of the Permitting Agencies' representatives on the TAC, then the parcel owner shall be approached to consider selling a conservation easement including a buffer area sufficient to maintain the hydrological needs of the plants. For blue skullcap, if the landowner rejects acquisition of the population, then the JPA shall, with the concurrence of the Permitting Agencies' representatives on the TAC, determine the appropriate mitigation measures (e.g., seed collection) for each plant population based upon the species type, relative health and abundance.

Mitigation Measure BIO-2b: The DWSP may impact primarily along the raw water pipeline alignment eel-grass pondweed and marsh skullcap, which are not listed species or species covered under the SJMSCP, but are CNPS List-2 species covered under CEQA *Guidelines* Section 15380. Therefore, the City shall conduct a pre-construction floristic survey for these species according to Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (CDFG, 2000) (Appendix E). These surveys shall be conducted during the species' blooming period, which occurs between June and July (eel-grass pondweed) and June and September (marsh skullcap). If these species cannot be avoided by the project, minimization and mitigation measures will be developed and implemented in consultation with the CDFG. These measures may include, but are not limited to the following:

a) Minimizing impacts by restricting removal of plants to a few individuals of a relatively large population;

b) Relocating plants to suitable habitat outside the project area, either within the project area or off-site;

c) Monitoring affected populations to document potential project-related impacts;

d) Implement habitat acquisition and/or mitigation bank participation to provide suitable compensation; and/or

e) Protecting occupied habitat for the species on-site or at another regional location.

Significance After Mitigation: Less than significant.

Impact BIO-3: Construction of the DWSP raw and treated water pipelines could result in temporary impacts to riparian habitats or other sensitive natural communities. Less than significant with mitigation.

Raw Water Pipelines

The raw water pipelines would be constructed within or along roadways and agricultural lands from the intake facility to the WTP site. Trenchless construction techniques would be used for sensitive areas such as larger waterway crossings, such as Honker Cut, Bishop Cut, and the intersection of Empire Tract Road and Eight Mile Road. Honker Cut and Bishop Cut have rip-rapped banks and do not support vegetated riparian corridors within the project area. There would be no to minimal impacts to scattered riparian vegetation that occurs along larger agricultural ditches within the project area, since the preferred routing and trenchless construction techniques (e.g., micro-tunneling, jack and bore, etc.) for the pipelines would avoid both sensitive wetland and riparian communities to the maximum extent possible.

Use of trenchless pipeline installation techniques to protect both sensitive aquatic habitat and riparian vegetation, where found along the pipeline alignments, would prevent the direct loss or degradation of riparian vegetation. Indirect impacts to riparian vegetation would occur under unanticipated circumstances (e.g., hydrofracture during drilling operations), which would result in adverse impacts to riparian resources such as disturbance during cleanup operations. Implementation of Mitigation Measure BIO-3 would ensure that potential impacts to riparian resources from pipeline construction would be reduced to less than significant. Operation of the pipelines would not cause impacts to riparian resources.

Treated Water Pipelines

The treated water pipelines would be constructed within roadways, agricultural land, and residential developments from the WTP to the existing City distribution system. Trenchless construction techniques would be used for sensitive areas such as larger waterway crossings (Pixley Slough and Bear Creek). There would be no to minimal impacts to scattered riparian vegetation that occurs along larger agricultural ditches within the project area, since the preferred routing and trenchless construction techniques (e.g., jack and bore, microtunneling, etc.) for the pipelines would avoid both sensitive wetland and riparian communities to the maximum extent possible. Both Pixley Slough and Bear Creek do not support vegetated riparian corridors in the area of the pipeline alignment.

Use of trenchless pipeline installation techniques to protect both sensitive aquatic habitat and riparian vegetation, where found along the pipeline alignments, would prevent the direct loss or degradation of riparian vegetation. Indirect impacts to riparian vegetation would occur under unanticipated circumstances (e.g., hydrofracture during drilling operations), which would result in adverse impacts to riparian resources such as disturbance during cleanup operations. Implementation of Mitigation Measure BIO-3 would ensure that potential impacts to riparian resources from pipeline construction would be reduced to less than significant. Operation of the pipelines would not impact riparian resources.

As described in Section 3.3, Geology, Soils, and Seismicity,; the proposed DWSP would require a NPDES Storm Water General Permit and an associated SWPPP for all construction phases of the project to mitigate for potential water quality impacts. Implementation of Mitigation Measure GEO-1 would reduce impacts to riparian areas. If open trench construction were used at drainage crossings containing riparian vegetation, implementation of Mitigation Measure BIO-1b would reduce impacts to riparian habitat to less than significant.

Mitigation Measure BIO-3: Implementation of Mitigation Measures GEO-1 and BIO-1b will reduce potential impacts to less than significant. In addition, at jack and bore locations, the bore pits will be excavated at least 50 feet outside the edge of riparian vegetation to avoid impacts.

Significance After Mitigation: Less than significant.

Impact BIO-4: Construction of the proposed DWSP raw and treated water pipelines could impact native wildlife migration corridors or nursery sites. Less than significant with mitigation.

Riparian habitat in the project area may serve as a wildlife migration corridor. Impacts to riparian habitat would affect wildlife corridors. These impacts would be significant; however, implementation of Mitigation Measures GEO-1 and BIO-3 would reduce the impacts to less than significant.

Mitigation: Impacts to riparian habitat that may serve as wildlife corridors will be avoided with the implementation of Mitigation Measures GEO-1 and BIO-3.

Significance After Mitigation: Less than significant.

Impact BIO-5: The proposed DWSP could conflict with adopted City and County tree preservation ordinances. Less than significant with mitigation for the WTP and the raw and treated water pipelines. No impact for the intake facility.

Intake Facility

No trees occur at the intake facility site; therefore, no impact would occur.

Raw Water Pipelines

Riparian habitat occurs within and near the pipeline alignment. Heritage trees may occur within or near the pipeline alignment. Although the DWSP is designed to avoid wetlands and ditches to a great extent, riparian habitat may be affected. Should heritage trees occur within or near the pipeline alignment, they may be affected by construction of the raw water pipelines. These impacts would potentially be significant; and would be reduced to less than significant by implementation of Mitigation Measure BIO-5a and 5b.

Water Treatment Plant

Heritage trees may occur near the WTP site and would be affected. This impact would be potentially significant, and would be reduced to less than significant by implementation of Mitigation Measure BIO-5a and 5b.

Treated Water Pipelines

If heritage trees occur within or near the pipeline alignments, they may be impacted by the construction of the treated water pipelines. These impacts would be potentially significant, and would be reduced to less than significant by implementation of Mitigation Measure BIO-5.

Mitigation Measure BIO-5: The City shall ensure that the DWSP complies with San Joaquin County's General Plan Tree Preservation and Riparian Habitat requirements, and with the City's Tree Preservation ordinance. Prior to construction the City shall conduct a survey for heritage trees that may be impacted by the project (i.e., the dripline of trees is within the treated water pipeline alignment). The City shall coordinate with City and County staff to ensure that impacts to heritage trees are avoided to the extent feasible.

If it is necessary to remove a heritage tree, a permit will be obtained from the City's Parks and Recreation Department. The tree(s) will be replaced on a one for one basis at the discretion of the City's Landscape Architect. The size of the replacement tree shall be based on the size of the tree removed.

If heritage trees are identified in riparian areas, the City shall implement Mitigation Measure BIO-3

Significance After Mitigation: Less than significant.

Impact BIO-6: The proposed DWSP would be consistent with the SJMSCP. No impact for all DWSP facilities.

The City will request approval from the SJMSCP JPA to have the raw and treated water pipeline alignments and the WTP site included under the SJMSCP (see discussion under Regulatory Setting above). (The intake facility would not be eligible for inclusion under the SJMSCP, but would be governed by National Marine Fisheries Service (NOAA Fisheries), USFWS, and CDFG regulations under a separate federal and state ESA compliance process, which the City is pursuing.)

Prior to project approval, the JPA must find that sufficient acres remain for SJMSCP permitted activities. The project's conversion of agricultural to non-agricultural land uses would not decrease the majority of the acreage available for coverage under the SJMSCP. The JPA must also find that mitigation pursuant to the SJMSCP is appropriate for the impacts on the SJMSCP covered species. The construction and operation of the raw and treated water pipelines and the WTP will not conflict with the SJMSCP. Therefore, there would be no impact.

Mitigation: No mitigation is required.

3.5.3 REFERENCES

California Department of Fish and Game (CDFG). 1995. Staff Report on Burrowing Owl Mitigation. Unpublished report. 8 pp. October 11, 1995.

California Department of Fish and Game (CDFG). 2000. Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities. State of California Resources Agency, Sacramento, California. Prepared December 1983 and revised in May 2000.

California Department of Fish and Game (CDFG). 2004a. California Natural Diversity Database, Rarefind 3 computer program. California Department of Fish and Game, Sacramento, California.

California Department of Fish and Game (CDFG). 2004b. Special Animals List. State of California Resources Agency, Department of Fish and Game, Wildlife and Habitat Data Analysis Branch, January 2004.

California Department of Fish and Game (CDFG) 2004c. Special Plants List. State of California Resources Agency, Department of Fish and Game, Wildlife and Habitat Data Analysis Branch, April, 2004.

California Native Plant Society (CNPS). 2004. Inventory of Rare and Endangered Plants. http://www.northcoast.com/~cnps/cgi-bin/cnps/sensinv.cgi

Environmental Science Associates. 2004. Stockton Delta Water Supply Project: Draft Wetland Delineation Report. Sacramento, California. Prepared April 2004.

GlobeXplorer. 2001. Color aerial photography. Available at: http://www.globexplorer.com.

Mayer, K. E., and W. F. Laudenslayer, Jr., eds. 1988. A Guide to Wildlife Habitats of California. California Department of Forestry and Fire Protection. Sacramento, CA.

McElhiney, M. A. 1992. Soil Survey of San Joaquin County, California. United States Department of Agriculture, Soil Conservation Service, in cooperation with the Regents of the University of California (Agricultural Experiment Station) and the California Department of Conservation.

San Joaquin Council of Governments. 2000. San Joaquin County Multi-Species Habitat Conservation and Open Space Plan. Stockton, California. November 14, 2000.

Sawyer, J. O., and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society. Sacramento, California.

Skinner M. W., and B. M. Pavlik. 1994. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California, Special Publication, 5th ed., California Native Plant Society.

U.S. Army Corps of Engineers (Corps). Undated. Memorandum on the Supreme Court Ruling Concerning CWA Jurisdiction over Isolated Waters. Written by General Counsel for the U.S. Environmental Protection Agency and Chief Counsel for the Corps. Available at http://www.spk.usace.army.mil/cespk-co/regulatory/pdf/SWANCC.pdf.

U.S. Fish and Wildlife Service (USFWS). 2004. Federal Endangered and Threatened Species that may be Affected by Projects in the Terminous and Lodi South 7 ½ Minute Quads. Available at: http://sacramento.fws.gov/es/spp_list.htm.

U.S. Geological Survey (USGS). 1968 (Photorevised 1976). 7.5' Topographic Quadrangle, Lodi South, California.

U.S. Geological Survey (USGS). 1978 (Minor Revision 1993). 7.5' Topographic Quadrangle, Terminous, California.

3.6 AIR QUALITY

This section provides an overview of existing air quality within the project area and surrounding region, associated regulatory framework, and an analysis of potential impacts to air quality that would result from implementation of the DWSP.

3.6.1 SETTING

CLIMATE AND METEOROLOGY

The proposed DWSP facilities and the City's water service area are located within the San Joaquin Valley Air Basin (SJVAB), a flat area bordered on the east by the Sierra Nevada Mountains; on the west by the Coast Ranges; and to the south by the Tehachapi Mountains. 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 (SJVAPCD, 2002a). Although air generally flows into the basin from the San Joaquin River Delta in the project area, the region's topographic features restrict air movement through and out of the basin. As a result, the SJVAB is highly susceptible to pollutant accumulation over time. Frequent transport of pollutants into the SJVAB from upwind sources also contributes to poor air quality (SJVAPCD, 2002a).

The primary factors determining air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

Wind speed and direction play an important role in dispersion and transportation of air pollutants. During summer months, winds usually originate out of the north end of the San Joaquin Valley (SJV) and flow in a south-southeasterly direction through the SJV, through the Tehachapi Pass and into the neighboring Southeast Desert Air Basin. During winter months, winds occasionally originate from the south end of the SJV and flow in a north-northwesterly direction. Also, during winter months, the SJV experiences light, variable winds, less than 10 miles per hour (mph). Low wind speeds, combined with low inversion layers in the winter, create a climate conducive to high concentrations of certain air pollutants (SJVAPCD, 2002a). Strong westerly winds in the summer range up to 35 mph on a daily basis (Western Regional Climate Center, 2004).

The SJVAB has an inland Mediterranean climate that is characterized by warm, dry summers and cool winters. Summer high temperatures often exceed 100^{o} F, averaging from the low 90s in the northern part of the valley to the high 90s in the south. Winters are for the most part mild and humid. Average high temperatures during the winter are in the 50s, while the average daily low temperature is about 45^{o} F (SJVAPCD, 2002a).

The vertical dispersion of air pollutants in the SJV is limited by the presence of persistent temperature inversions. Air temperatures usually decrease with an increase in altitude. A reversal of this atmospheric state, where the air temperature increases with height, is referred to as an inversion. Air above and below an inversion does not mix because of differences in air density. Inversions in the SJVAB can restrict air pollutant dispersal (SJVAPCD, 2002a).

EXISTING CONDITIONS

The CARB's regional air quality monitoring network provides information on ambient concentrations of criteria air pollutants. Two monitoring stations are generally representative of background air pollutant concentrations in a project area and its vicinity (CARB, 2004). Two such monitoring stations are located in the project vicinity: (1) a monitoring station on Hazelton Street approximately 11 miles southeast of the project area that monitors for ozone and CO, and (2) a monitoring station near Stockton Wagner Holt School approximately 1.5 miles south of the project area that monitors PM_{10}. Table 3.6-1 presents a five-year summary of air pollutant (concentration) monitoring data collected at these stations. The table also compares air pollutant concentrations with the available or more stringent of the federal or state Ambient Air Quality Standards (AAQS).

Criteria Air Pollutants

Ozone

Ozone is not usually 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, which are emitted directly into the atmosphere, are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursor presence for approximately three hours in a stable atmosphere with strong sunlight. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production.

While ozone in the upper atmosphere protects the earth from harmful ultraviolet radiation, high concentrations of ground level ozone can adversely affect the human respiratory system. Many respiratory ailments, as well as cardiovascular diseases, are aggravated by exposure to high ozone levels (SJVAPCD, 2002a).

Carbon Monoxide (CO)

CO is an odorless and colorless gas that can be highly toxic. CO is formed by the incomplete combustion of fuels and is, unlike ozone, emitted directly into the air. Ambient CO concentrations normally are considered a local effect and typically correspond to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area some distance from vehicular sources. CO binds with hemoglobin, the oxygen-carrying protein in blood, and reduces the blood's capacity for carrying oxygen to the

TABLE 3.6-1
AIR POLLUTANT MONITORING DATA IN THE VICINITY OF THE PROJECT AREA, 1999–2004

	Annual Concentrations						
Pollutant	**Std.**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Ozone at Stockton-Hazelton Street Station:							
Highest 1-hour-average concentration, ppm[a]	0.09	0.144	0.107	0.103	0.102	0.104	0.096
Number of state violations[b]		6	4	5	2	3	1
Highest 8-hour-average concentration, ppm[a]	0.08	0.108	0.080	0.088	0.081	0.088	NA[d]
Number of federal violations[c]		4	0	1	0	1	0
CO at Stockton-Hazelton Street Station:							
Highest 8-hour-average concentration, ppm [a]	9.0	5.34	3.91	6.03	3.21	3.14	2.26
Number of state violations[b]		0	0	0	0	0	0
PM_{10} at Stockton-Hazelton Street Station:							
Highest 24-hour average concentration, μg/m^3 [a]	50	155	97	147	91	90	50
Number of state violations[b]		67	52	64	58	17	NA[d]
PM_{10} at Stockton-Wagner-Holt School Station:							
Highest 24-hour-average concentration, μg/m^3 [a]	50	125	110	128	84	53	44
Number of state violations[b]		NA[d]	60	NA	39.0	20.2	NA[d]

a ppm: parts per million; μg/m^3: micrograms per cubic meter.
b Number of violations refers to the number of days in a given year during which excesses of the state standard were recorded.
c Number of violations refers to the estimated number of days in a given year during which excesses of the federal standard were recorded.
d NA = Not Available

SOURCE: CARB, 2004.

heart, brain, and other parts of the body. At high concentrations, CO can cause heart difficulties in people with chronic diseases, can impair mental abilities, and can cause death (SJVAPCD, 2002a).

Exceedances of CO standards are most likely to occur in winter months when relatively low inversion levels trap pollutants and increase CO concentrations near the ground surface.

Suspended Particulate Matter (PM_{10})

Suspended particulate matter (airborne dust) consists of particles small enough to remain suspended in the air for long periods. PM_{10} consists of particulate matter 10 microns (a micron is one-millionth of a meter or less in diameter), which can be inhaled and cause adverse health effects (SJVAPCD, 2002a). Particulate matter in the atmosphere results from many kinds of dust and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations such as demolition and construction activities primarily contribute to increases in local PM_{10} concentrations, while others such as vehicular traffic affect regional PM_{10} concentrations (SJVAPCD, 2002a).

Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory disease, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a direct association between mortality and daily concentrations of particulate matter in the air (SJVAPCD, 2002a). Major sources of PM_{10} in the SJV include motor vehicles, power generation, industrial processes, wood burning, roads, and construction and farming activities (SJVAPCD, 2002a). Fugitive windblown dust also represents a significant source of airborne dust in the SJVAB (SJVAPCD, 2002a).

Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ includes particulate matter of 2.5 microns in diameter. $PM_{2.5}$ is small enough to be inhaled, pass through the respiratory system, and lodge in the lungs with resultant health effects (SJVAPCD, 2002a). $PM_{2.5}$ comprises dust, sand, salt spray, metallic, and mineral particles, pollen, smoke, mist, and acid fumes. The actual composition varies with time and location, and depends upon the sources of the material and meteorological conditions (SJVAPCD, 2002a).

Based on health studies conducted, $PM_{2.5}$ is considered to be more harmful to human health than any other pollutant (SJVAPCD, 2004e). The sources and acute and chronic effects of $PM_{2.5}$ are similar to those associated with PM_{10} (refer to discussion for PM_{10}).

Since the PM_{10} standards were established in 1987, a large number of new studies have been published on the health effects of particulate matter. Many of these studies suggest that significant effects, such as premature mortalities, hospital admissions, and respiratory illnesses, occur at concentrations below the 1987 standards (SJVAPCD, 2004e). In July 1997, the USEPA adopted new air quality standards for ozone and particulate matter. USEPA peer-reviewed scientific studies and determined that these changes were necessary to protect the public health and environment. The USEPA established annual and 24-hour standards for the fine fraction of particulates and revised the primary (health-based) PM standards by adding a new annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ and a new 24-hour standard of 65 $\mu g/m^3$ (SJVAPCD, 2004e). USEPA has yet to promulgate the air quality designations of the various regions for the new $PM_{2.5}$ standard (SJVAPCD, 2004e).

The USEPA also revised the secondary (welfare-based) standards by making them identical to the primary standards. The purpose of the secondary standards in combination with the federal regional haze program is to provide protection against the major PM-related welfare effects, such as visibility impairment, soiling, and materials damage. Other recent changes made by the USEPA include rules to address the monitoring network design for the new $PM_{2.5}$ standards and to improve visibility by requiring states to develop programs to help reduce regional haze (SJVAPCD, 2004e).

SENSITIVE RECEPTORS

Facilities such as schools, hospitals, residences, and convalescent homes are considered to be sensitive to poor air quality because infants and children, the elderly, and people with health problems, 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 receptors are discussed below in more detail by project facility and are shown in Figure 3.2-1 in Section 3.2, Land Use, Recreation, and Aesthetic Resources.

Sensitive receptors in the vicinity of the proposed intake facility site include residences on the islands located west of Empire Tract Road; the closest residence is approximately 1,050 feet from the proposed intake site. A few residences, a marina, and business rental units are located at the intersection of Empire Tract Road and Eight Mile Road, approximately one mile north of the intake site.

Sensitive receptors along the raw water pipeline alignment include the residences discussed above for the intake facility and residential communities on Eight Mile Road close to I-5 and Davis Road. Other sensitive receptors are the Oak Grove Regional Park located along Eight Mile Road near I-5, and Bear Creek Church located on Lower Sacramento Road slightly north of Eight Mile Road.

The treated water pipeline alignment covers the same sensitive receptors as stated for the raw water pipeline alignment along Eight Mile Road. The area near the Davis Road segment and the urban area of Stockton where the treated water pipeline would connect to the existing distribution system consists of predominantly residential and commercial units. No sensitive receptors occur along the proposed West Lane segment of the treated water pipeline.

The 126-acre parcel containing the proposed WTP site includes a few residences nearby; particularly a residence located approximately 1,000 feet southeast of the WTP site and residences approximately 2,000 feet or more east of the WTP site on Lower Sacramento Road. The Bear Creek Church is approximately 2,000 feet or more south of the WTP site on Lower Sacramento Road.

REGULATORY SETTING

Federal

The U.S. Environmental Protection Agency (USEPA) has been charged with implementing national air quality programs. The USEPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA). The primary role of the USEPA at the state level is to oversee state air quality programs (SJVAPCD, 2002a). The CAA requires the USEPA to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. National standards have been established for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), suspended particulate matter (PM_{10} and $PM_{2.5}$), and lead (SJVAPCD, 2002a). These pollutants are referred to as "criteria" air pollutants because they were established on the basis of health criteria. The CAA requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The USEPA has the responsibility to review the state's SIP to determine if it conforms to the CAA mandates and will achieve air quality goals when implemented (SJVAPCD, 2002a).

State

The California Air Resources Board (CARB) is California's state air quality management agency. The CARB is responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the state or California CAA (SJVAPCD, 2002a). The CARB regulates mobile emissions sources, and oversees the activities of regional/county air districts. The CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the national standards established by the USEPA. The CARB combines its data with all the local district data and submits the completed SIP to the USEPA. The SIP consists of emission standards for vehicular sources and consumer products set by the CARB. The SIP also contains attainment plans adopted by the air pollution control districts and air quality management districts and approved by the CARB (SJVAPCD, 2002a).

California has adopted more stringent ambient air quality standards for the criteria air pollutants (referred to as the State ambient air quality standards [State standards]) and has adopted air quality standards for some pollutants for which there are no corresponding national standards. Table 3.6-2 presents both state and federal ambient air quality standards.

Attainment Status

Under amendments to the federal CAA, the USEPA has classified air basins, or portions thereof, as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. In 1988, the state legislature passed the California Clean Air Act, which is patterned after the federal CAA to the extent that it also requires areas to be designated as "attainment" or "nonattainment," but with respect to the State standards, rather than the national standards.

TABLE 3.6-2
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Average Time	California Standards		Federal Standards		
		Concentration	Method	Primary [1]	Secondary [2]	Method
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	0.12 ppm (235 µg/ m^3)	Same as Primary Standard	Ultraviolet Photometry
	8 Hours	–		0.08 ppm (157 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24 Hours	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		50 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	24 Hours	No Separate State Standards		65 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8 Hours	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hours (Lake Tahoe)	6 ppm (7 mg/m^3)		–	–	–
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	–	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 µg/m^3)		–		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	–	Spectrophotometry (Paraosaniline Method)
	24 Hours	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	–	
	3 Hours	–		–	0.5 ppm (1,300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		–	–	–
Lead	30 Day Average	(1.5 µg/m^3)	Atomic Absorption	–	–	–
	Calendar Quarter	–		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hours	Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24 Hours	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride	24 Hours	0.01 ppm (26 µg/m^3)	Gas Chromatography			

[1] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
[2] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
ppm: parts per million
µg/m^3: micrograms per cubic meter

Source: CARB (2003a).

The SJVAB is designated as "severe nonattainment" and "nonattainment" for the State standards for ozone and PM_{10}, respectively (SJVAPCD, 2004a). With respect to federal standards, the SJVAB is designated as "extreme nonattainment" and "serious attainment" for ozone and PM_{10}, respectively. San Joaquin County is considered "attainment" for the state CO standard and "unclassified or attainment" for the federal CO standard. The USEPA has not classified any air basins in California for the recently adopted $PM_{2.5}$ standard due to the lack of data (SJVAPCD, 2002a; SJVAPCD, 2004a). Both the national CAA and the state CAA require "nonattainment" areas to prepare plans that include strategies for achieving attainment.

Regional

The San Joaquin Valley Air Pollution Control District (SJVAPCD or Valley Air District) is the regional agency empowered to regulate air pollutant emissions from stationary sources in the SJVAB. The Valley Air District regulates air quality through its permitting authority over most types of stationary emission sources and through its planning and review activities. The Valley Air District continuously monitors its progress in implementing attainment plans and must periodically report to the CARB and the USEPA. Attainment plans must be revised periodically to reflect new conditions and requirements in accordance with the federal CAA and California CAA (SJVAPCD, 2002a).

The California CAA requires air districts to adopt an air quality attainment plan and to review and revise these plans once every three years. The *1991 Air Quality Attainment Plan*, updated in 2001, was developed to meet the requirements of the California CAA (SJVAPCD, 2002a). This plan, initially updated with the *Federal Ozone Attainment Plan* in 1994, establishes the regulatory framework needed to bring the SJVAB into compliance with the schedules mandated by the federal CAA and the state CAA. The federal CAA and California CAA plans are described below.

The *1991 Air Quality Attainment Plan* identifies the following three strategies for reducing emissions generated by indirect sources: (1) enhanced Valley Air District participation in the CEQA review process; (2) encouragement of all cities and counties in the SJV to adopt an air quality element of air quality policies as part of their General Plan; and (3) implementation of a new modified indirect source review program (SJVAPCD, 2002a). Valley Air District staff actively review and comment on CEQA documents prepared by lead agencies, using the *Air Quality Guidelines for General Plans*, adopted in 1994. The modified indirect source review program has not yet been implemented.

To satisfy federal and California CAA requirements, the Valley Air District has submitted several air quality attainment plans to show how standards will be met. The following describes the current federal and state air quality plans as they apply to the SJVAB:

- *1992 Federal Attainment Plan for Carbon Monoxide.* This plan establishes the regulatory framework needed to bring the SJVAB into compliance with the national standards for CO. This plan demonstrates that CO attainment has already been achieved (SJVUAPCD, 2001; SJVAPCD, 2002a).

- *The Federal Ozone Attainment Demonstration Plan* (adopted November 14, 1994). This plan establishes the regulatory framework needed to bring the SJVAB into compliance with the national standards for ozone. This plan also satisfies the required triennial review for State standards and demonstrates how the national standards for ozone will be met by 1999 (SJVAPCD, 2002a; SJVAPCD, 2004b).

- *California Clean Air Act Triennial Progress Report and Plan Revision 1997–1999 (2001).* The California Clean Air Act Triennial Progress Report and Plan Revision 1995–1997 (1997 Triennial Update) was adopted in December 1998 by the Valley Air District and approved by the CARB in October 1999. No change in the Valley Air District's ozone attainment strategy was set forth in the Update. However, in the Update, the Valley Air District revised its rulemaking schedule for developing rules to which the District was already committed. Also, the Valley Air District committed to further evaluate 12 control measures included on the CARB's list of Achievable Performance Standards. The CARB conditionally approved the 1997 Triennial Report, subject to the Valley Air District adopting eight specific measures no later than the end of 2000, and prioritizing 18 additional identified measures and adopting at least four per year during the 2001–2003 and 2004–2006 planning cycles (SJVAPCD, 2002a; SJVAPCD, 2004c).

- *2003 PM_{10} Plan*. This plan is the SJVAPCD's strategy for achieving the NAAQS for PM_{10}. The plan is designed to meet the requirements of the federal CAA and contains measures needed to attain the NAAQS at the earliest possible date. The PM_{10} Plan will become part of the SIP for the SJV (SJVAPCD, 2003).

The SJVAPCD's primary means of implementing the above air quality plans is by adopting and enforcing rules and regulations. In 2001, SJVAPCD revised its Regulation VIII-Fugitive PM Prohibitions in response to commitments made in the 1997 PM_{10} Attainment Plan to incorporate best available control measures. The revision also includes new rules for open areas and agricultural operations. The provisions of the revised regulation took effect in May 2002.

Regulation VIII consists of a series of dust control rules intended to implement the *PM10 Attainment Demonstration Plan*. The *PM10 Attainment Demonstration Plan* emphasizes reducing fugitive dust as a means of achieving attainment of the federal standards for PM_{10} (SJVAPCD, 2002a). The rule specifically addresses the following activities:

- construction, demolition, excavation, extraction;
- handling and storage of bulk materials;
- landfill disposal sites;
- paved and unpaved roads; and
- vehicle and/or equipment parking, shipping receiving, transfer, fueling, and service areas.

Under the federal CAA, federal actions conducted in Air Basins out of attainment of the federal ozone standard (such as the SJVAB) must demonstrate conformity with the SIP. Conformity to a SIP is defined in the federal CAA as meaning conformity to a SIP's purpose of eliminating or reducing the severity and number of violations of the national standards and achieving such expeditious attainment of such standards. The Valley Air District has published Regulation IX, Rule 9110 (referred to as the General Conformity Rule) that indicates how most federal agencies could make such a determination (SJVAPCD, 2004d).[1] The DWSP is not a federal action; therefore, Rule 9110 does not apply to the DWSP.

In addition to regulating criteria air pollutants, the Valley Air District limits emissions of and public exposure to hazardous air pollutants through a number of programs. The District's Permit Services Division reviews the potential for hazardous air pollutants emissions from new and modified stationary sources. The Permit Services Division then implements the Valley Air District's Risk Management Policy through a permitting process for stationary sources.

Valley Air District Rule 4102 (SJVUAPCD, 1992) prohibits nuisance including air pollution. The purpose of the rule is to protect public health and safety. The rule applies to any source operation that emits or may emit air contaminants or other materials. The rule states that "a person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property."

Construction and operation of the DWSP would require an Authority to Construct and Permit to Operate, respectively, from the Valley Air District. In addition, Valley Air District permits may be required for stationary emissions sources such as emergency and standby diesel generators installed at the WTP, and other various processes or equipment at the WTP. The Valley Air District's permitting authority does not extend to general land use development or to the operation of on-road motor vehicles (autos, trucks, and buses).

Local

San Joaquin County

Chapter 9-1025 for Performance Standards in the San Joaquin County Code provides standards to mitigate dangerous or objectionable environmental impacts of commercial and industrial uses, pursuant to the health and safety policies of the San Joaquin County General Plan (San Joaquin County, 1992). County Code 9-1025.3, Ordinance 3675 states that all emissions shall be subject to the rules and regulations of the Valley Air District. County Code 9-1025.4 states, "all uses shall be so operated as not to cause odors which are perceptible and offensive to the average person at any residential lot line. Primary and secondary safe-guard systems shall be provided to control odors."

The following objectives and policies in the San Joaquin County General Plan address air quality.

Objective 1: To protect public health, agricultural crops, scenic resources, and the built and natural environments from air pollution.

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[1] The SJVAPCD's Rule 9110 is consistent with the USEPA's General Conformity Rule, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* (Title 40 of the Code of Federal Regulations [CFR], Part 93.)

Policies:

1. San Joaquin County shall meet and maintain all State and national standards for air quality.

2. Motor vehicle emissions shall be minimized through land use and transportation strategies, as well as by promotion of alternative fuels.

3. Projects shall be designed to minimize concentrations of carbon monoxide (hot spots).

City of Stockton

The City of Stockton General Plan Conservation Element (City of Stockton, 1990) contains goals and policies that encourage emission reduction strategies from mobile, stationary and area sources that comply with state and federal standards. These goals and policies are provided below:

Goal 3: Achieve and maintain levels of air quality that comply with state and federal standards.

Policies:

1. Consider the cumulative air quality impacts from development and land use regulations to reduce air pollution.

2. The expansion and improvement of public transportation services and facilities shall be promoted for its air quality benefits.

3. Cooperate with the State Air Resources Board, the County Air Pollution Control District, and other agencies in formulating and monitoring strategies and tactics to reduce air pollution emissions.

Goal 5. Actively contribute to the solution of local and regional air quality problems.

Policies:

1. Cooperate with other local and regional and State agencies in developing and implementing air quality plans to achieve State and Federal Ambient Air Quality standards.

2. Review proposed development for local and regional air quality impacts.

3. Assist project applicants in understanding and meeting the air quality mitigation requirements established by the SJVAPCD.

4. Coordinate City Transportation System Management programs with countywide programs developed by the San Joaquin County Council of Governments and the Valley Air District.

5. Coordinate City Transportation System Management programs with private transportation management agency programs being developed by the Building Industry Association and the Chamber of Commerce.

6. Ensure an adequate separation between sensitive land uses (residential, educational, health care) and industrial land uses to minimize land use compatibility problems associated odors and air pollutant emissions from industrial areas.

3.6.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

CEQA Guidelines define a significant effect on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by a project. An air quality impact would be considered significant if it would result in any of the following:

- 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 criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people.

In addition, the Valley Air District has established thresholds of significance for construction impacts, project operations, and cumulative impacts.

For construction impacts, the pollutant of greatest concern is PM_{10}.[2] The Valley Air District recommends that significance be based on the consideration of control measures to be implemented during project construction (SJVAPCD, 2002b). Compliance with Regulation VIII and implementation of appropriate mitigation measures to control PM_{10} emissions are considered to be sufficient to render a project's impacts less than significant. The Valley Air District's *Guide for Assessing and Mitigating Air Quality Impacts* (*GAMAQI*) (2002) contains a list of feasible control measures for construction-related PM_{10} emissions.

The Valley Air District'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 associated with the project, but do not include stationary sources

[2] Construction equipment emits CO 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 project construction (SJVAPCD, 2002b).

covered under a permit with the Valley Air District. The significance criteria for direct and indirect sources combined are 10 tons per year for ROG and NO_x (SJVAPCD, 2002b). Projects that emit ozone precursors in excess of these levels would be considered to have a significant air quality impact (SJVAPCD, 2002b). Stationary sources that comply, or would comply, with Valley Air District Rules and Regulations generally are not considered to have a significant air quality impact.

For the proposed DWSP, the significance criteria of 10 tons per year for both ROG and NO_x was also used for combined construction emissions, because the project would be large in scale and construction activity would last for approximately two years.

METHODOLOGY

The methodology used to determine the significance of project impacts consisted of comparing the construction and operational impacts of the DWSP with local, state, and federal standards. The emissions potentially resulting from the DWSP were evaluated against existing conditions or baseline air emissions.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.6-3 provides a summary of the significant and less than significant air quality impacts associated with specific components of the DWSP.

TABLE 3.6-3
SUMMARY OF IMPACTS – AIR QUALITY

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
AIR-1: Construction of DWSP facilities would result in a temporary increase in air pollutant emissions.	SU*	SU*	SU*	SU*	SU*
AIR-2: Operation of DWSP facilities would result in air emissions from powering of pumps, various processes, and equipment at the WTP and from vehicle trips to DWSP facilities.	LS	LS	NI	LSM	NI
AIR-3: Operation of DWSP facilities could result in odors.	NI	NI	NI	NI	NI

* The criteria air pollutant emission levels associated with construction activities were added together in order to determine significance due to concurrent construction activity and due to the regional distribution of ROG, NO_x, and PM_{10}.

SU = Significant Unavoidable Impact
LSM = Less than Significant Impact with Mitigation
LS = Less than Significant Impact
NI = No Impact

IMPACT STATEMENTS AND MITIGATION MEASURES

Impact AIR-1: Construction of DWSP facilities would result in a temporary increase in air pollutant emissions. Significant unavoidable for NO_x and ROG for all DWSP facilities. Less than significant with mitigation for PM_{10} and CO for all DWSP facilities.

Fugitive dust emitted during construction would vary greatly depending upon the level of activity, 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. However, the smaller-diameter particles (e.g., PM_{10}) generally remain airborne until removed from the atmosphere by moisture and are associated with adverse health effects. Sensitive receptors in the project area include residences, Bear Creek Church, and Oak Grove Regional Park (Figure 3.2-1). Therefore, unmitigated construction dust emissions would result in significant local effects. The Valley Air District recommends that determination of significance with respect to construction impacts be based not on quantification of emissions and comparison to thresholds (SJVAPCD, 2002b), but upon inclusion of feasible control measures for PM_{10} and compliance with Regulation VIII, Rule 8011.

Implementation of all Regulation VIII fugitive dust control measures are required by law for all construction projects. Implementation of the Regulation VIII fugitive dust control measures would reduce construction fugitive dust emissions associated with all DWSP facilities to a less than significant level based on the short-term exposure of any single sensitive receptor to residual fugitive dust emissions.

Construction equipment, on-road heavy-duty trucks, and construction-worker vehicles would also generate criteria air pollutant emissions. The Valley Air District *GAMAQI* recognizes that construction equipment emits ozone precursors and indicates that very large construction projects may exceed the annual thresholds for ROG and NO_x emissions, in which case the Valley Air District will recommend quantification methods for these projects on a case-by-case basis (SJVAPCD, 2002b).

Table 3.6-4 depicts estimated on-road vehicle and off-road equipment criteria air pollutant (ROG, CO, NO_x, and PM_{10}) emissions and significance for the DWSP facilities. Criteria pollutant concentrations of ROG and NO_x from construction-related on-road vehicles and off-road construction equipment would incrementally add to the regional atmospheric loading of ozone precursors during the two-year construction period. ROG and NO_x emissions (primarily off-road equipment emissions) from the construction of the DWSP facilities would exceed the Valley Air District's 10 ton per year threshold for each pollutant.

Trucks traveling to and from the construction sites would include dump trucks to transport excavated material, flatbed semi trucks and trailers to transport pipes, concrete ready-mix trucks to transport controlled density fill and concrete, and other miscellaneous trucks to support construction activities. It is expected that the contractor would attempt to balance cut and fill

TABLE 3.6-4
DWSP CONSTRUCTION-RELATED CRITERIA AIR POLLUTANT EMISSIONS AND SIGNIFICANCE

On-road Construction-Related Vehicle Emissions (tons/year)[a]					
Facility	**ROG**	**CO**	**NO_x**	**PM_{10}**	**Significant? (Yes or No)[b]**
Intake Facility	0	3	2	0	No
Raw Water Pipelines	0	6	7	0	No
Water Treatment Plant	0	3	1	0	No
Treated Water Pipelines	0	2	2	0	No
Total Onroad Vehicle Emissions	1	14	**12**	0	**Yes**
Off-road Equipment Emissions (tons/year)[c]					
Facility	**ROG**	**CO**	**NO_x**	**PM_{10}**	**Significant? (Yes or No)**
Intake Facility	2	6	**28**	2	**Yes**
Raw Water Pipelines	2	6	**27**	1	**Yes**
Water Treatment Plant	4	11	**37**	3	**Yes**
Treated Water Pipelines	1	2	8	0	No
Total Offroad Equipment Emissions	9	25	**100**	7	**Yes**
PM_{10} (Fugitive Dust) from Total Disturbed Area of 16 Acres at a Time (tons/yr)				5	NA
Total Construction Emissions (tons/year)	**ROG**	**CO**	**NO_x**	**PM_{10}**	**Significant? (Yes or No)**
	10	39	**111**	12	**Yes for ROG and NOx**

a Calculations based on EMFAC 2002 model emission factors with an assumed average speed of 35 mph. ROG, NO_x, and PM_{10} values are based on an average summer temperature of 82^o F; CO value is based on an average winter temperature of 54^o F (CARB, 2003c). Construction worker trips are based on crew sizes listed in MWH (2005a, b, c, and d). Truck trip information for the raw and treated water pipelines are from MWH (2005b and d) … Truck trip information for the WTP and intake facility are from Section 3.9 (Traffic and Transportation) of this EIR. An average roundtrip of 40 miles was assumed.

b SJVAPCD threshold of significance is 10 tons per year for both ROG and NO_x. PM_{10} and CO do not have established significance thresholds. Values in **bold** are in excess of the applicable standard.

c Off-road equipment air pollutant emissions are based on equipment inventories from the MWH Technical Memorandum for each facility (MWH, 2005a, b, c, and d) and the OFFROAD Model emission factors. Equipment was assumed to be 10 years old and have a daily usage of eight hours.

Source: Environmental Science Associates, 2005 quantities within the construction area. On-road vehicle emissions are based on criteria pollutant emission factors from CARB's EMFAC 2002 model (CARB, 2003b). Criteria air pollutant emissions from off-road equipment were estimated based on inventories of off-road equipment associated with the construction of each DWSP facility and emission factors from CARB's most recent OFFROAD model (CARB, 2000a).

Construction activities would also include demolition of a vacant single family farmhouse and farm buildings on the WTP site. Existing buildings often include materials containing asbestos. Airborne asbestos fibers pose a serious health threat if adequate control techniques are not carried out when the material is disturbed. Demolition, excavation, or removal of asbestos-containing materials is subject to the limitations of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) as listed in 40 CFR Part 61, Subpart M, requiring notification and inspection. Most demolition and many renovation activities are subject to an asbestos inspection prior to start of an activity (SJVAPCD, 2002b). The City will consult with the Valley Air District's Compliance Division prior to commencing demolition to determine inspection and compliance requirements. As stated in the *GAMAQI*, the City will comply with existing asbestos regulations. Therefore, the impact from asbestos emissions would be less than significant.

Mitigation Measure AIR-1a: The City shall comply with Regulation VIII and implement its control measures during construction.

The following applicable control measures listed by the Valley Air District shall be implemented, where appropriate (SJVUAPCD, 2004).

- The City shall submit a Dust Control Plan subject to review and approval of the Valley Air District at least 30 days prior to the start of any construction activity on a site that includes five acres or more of disturbed surface area (SJVUAPCD, 2004).

Specific control measures for construction, excavation, extraction, and other earthmoving activities listed by the Valley Air District (SJVUAPCD, 2004) include:

Pre-Activity

- Pre-water site sufficient to limit visible dust emissions to 20 percent opacity, and
- Phase work to reduce the amount of disturbed surface area at any one time.

During Active Operations

- Apply water or chemical/organic stabilizers/suppressants sufficient to limit the visible dust emissions to 20 percent opacity; or
- Construct and maintain wind barriers sufficient to limit the visible dust emissions to 20 percent opacity. If utilizing wind barriers, the above control measure shall also be implemented.

- Apply water or chemical/organic stabilizers/suppressants to unpaved haul/access roads and unpaved vehicle/equipment traffic areas sufficient to limit the visible dust emissions to 20 percent opacity and meet the conditions of a stabilized unpaved road surface.

Temporary Stabilization During Periods of Inactivity

- Restrict vehicular access to the area; and

- Apply water or chemical/organic stabilizers/suppressants, sufficient to comply with the conditions of a stabilized surface. If 0.5 acres or more of disturbed surface area remains unused for seven or more days, the area must comply with the conditions for a stabilized surface area as defined in Rule 8011.

Vehicle Movement:

- Limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within constructions sites to a maximum of 15 miles per hour.

- Post speed limit signs that meet state and federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads.

- To control wind generated fugitive dust, outdoor construction, excavation, extraction, and other earth moving activities that disturb the soil shall cease whenever the visible dust emissions exceeds 20 percent opacity.

Demolition Activities

- Apply sufficient water to building exterior surfaces, unpaved surface areas where equipment will operate, and razed building materials to limit the visible dust emissions to 20 percent opacity throughout the duration of razing and demolition activities.

- Apply sufficient dust suppressants to unpaved surface areas within 100 feet where materials from razing or demolition activities will fall in order to limit the visible dust emissions to 20 percent opacity.

- Apply sufficient dust suppressants to unpaved surface areas where wrecking or hauling equipment will be operated in order to limit the visible dust emissions to 20 percent opacity.

- Handling, storage, and transport of bulk materials on-site or off-site resulting from the demolition of buildings shall comply with the requirements specified in Rule 8031 (Bulk Materials).

- Apply water within one hour of demolition to unpaved surfaces within 100 feet of the demolished structure.

- Prevent and remove carryout or trackout on paved public access roads from demolition operations in accordance with Rule 8041 (Carryout and Trackout).

Mitigation Measure AIR-1b: The City shall implement the following mitigation measures listed below to reduce ozone precursor (NO_x and ROG) emissions from off-road equipment, where appropriate.

- Use of alternative fueled or catalyst equipped diesel construction equipment;
- Minimize idling time (e.g., 10 minute maximum);
- Limit the hours of operation of heavy duty equipment and/or the amount of equipment in use;
- Replace fossil-fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set); and
- Implement activity management (e.g., rescheduling activities to reduce short-term impacts).

Significance After Mitigation: Significant unavoidable for NO_x and ROG. Less than significant for PM_{10} and CO.

Impact AIR-2: Operation of the DWSP facilities would result in air emissions from powering of pumps, various processes, and equipment at the WTP and from vehicle trips to DWSP facilities. Less than significant with mitigation for the WTP. Less than significant for the intake facility. No impact for the raw and treated water pipelines.

Potential emission sources resulting from project implementation include emissions from powering of pumps, the testing and potential use of emergency generators, various processes and equipment emissions at the WTP site, and emissions from vehicle trips. Periodic deliveries and use of chemicals would also be part of normal operations. Emissions from the emergency generators would be local in nature, while emissions resulting from powering of pumps and from motor vehicles would be regional.

Intake Facility

Following installation, the proposed intake facility would require minimal maintenance. Pump operation would be by remote control. The electrically driven pumps would not generate local emissions directly, but would result in emissions at a power plant within or outside of the SJVAB. Power plant emissions, if located in California, are subject to the Rules and Regulations of the air district in which they are located and have been subject to their own regulatory review. Emissions from power generation to supply pumps would occur anywhere in the western U.S. power grid and emissions from motors to service the pumps would be regional. Energy would be supplied by permitted power sources, such as sources permitted by the California Energy Commission's Application for Certification (CEQA equivalent) process. For the initial pump station capacity for a 30 mgd WTP, the total connected electrical load for the intake facility would be approximately 850 kVA. The emergency generators would burn diesel fuel and would generate combustion emissions during operation. The generators would not be operated under normal conditions, but would likely be run for up to one hour per week for testing. Because the generators are stationary point sources, they would be subject to review and permitting by Valley Air District. Once the intake facility is fully functional, its operation would not be labor intensive.

Permanent employees or daily worker trips would be not required to operate the intake system; however, occasional inspection and maintenance would occur. The associated vehicle trip emissions would be minimal and thus would result in less than significant long-term operational emissions.

Raw and Treated Water Pipelines

Once installed, the raw and treated water pipelines would only need routine maintenance that would not require permanent employees or daily worker trips. The resulting employee vehicle trips would be minimal, thus resulting in no operational impacts.

Water Treatment Plant

Valley Air District Rules and Regulations require that all stationary sources of air emissions obtain an "Authority to Construct" and "Permit to Operate." In accordance with the Valley Air District's Regulation II (Rule 2201), all proposed air emission sources and water treatment processes (e.g., ozonation) at the WTP would be subject to Valley Air District review and permitting. The permit review process would ensure that all air emissions associated with the WTP comply with federal and State standards. Generally, any new permitted sources emitting more than two pounds per day of NO_x and ROG must meet Best Available Control Technology requirements. Stationary sources that comply, or would comply, with Valley Air District Rules and Regulations generally would not be considered to have significant air quality impacts.

The water treatment processes at the proposed WTP facility would involve chemical coagulation, flocculation, filtration, disinfection, and the option for ozonation. Chemicals used in these processes would be stored on-site and would include aluminum sulfate, polymers, filter aid polymer, sodium hydroxide, sodium hypochlorite, powdered activated carbon, citric acid, and sodium bisulfite. These chemicals would be stored in tanks, drums, etc. within a designated chemical building. The chemical tank vents would be subject to Valley Air District permitting. Such permits may require scrubbing of air vented from these tanks to remove acid and caustic vapors. If determined necessary, the ozonation process would be subject to Valley Air District review and permitting. Air pollutant emissions associated with ozonation are expected to be minimal. The ozone used in this process would be generated on-site.

The overall estimated power requirements for the 30 mgd WTP would be approximately 2,630 kVA for conventional treatment and 2,700 kVA for membrane treatment. Two separate primary feeds into two transformers would serve as the primary backup power supply. Diesel generators would be used as an alternative backup power supply. The diesel generators would generate combustion emissions during operations. Assuming a 50 percent backup generation capacity, a

1,500 kVA generator would be required for the 30 mgd WTP. The generator would use 150 gallons of fuel per hour at full load and would require approximately 1,200 gallons of fuel for an eight-hour period (full load). Less fuel would be consumed, if the load is less than 1,500 kVA.

The WTP would operate continuously, 24 hours per day, every day of the year with ongoing operation and maintenance. Most staff would be on-site during daytime hours (approximately 7:00 am to 5:00 pm). It is expected that WTP operators (approximately four per shift) would be on-site at all times (i.e., 24 hours per day). In addition, deliveries of materials (e.g., chemicals), scheduled and emergency maintenance, and waste disposal service would generate trips to and from the WTP. The number of daily vehicle trips generated by the DWSP would not exceed 60 round trips per day during operation. The overall number of trips would be substantially below the trip threshold (1,506 trips per day) of the Valley Air District for analysis of small projects (SJVAPCD, 2002b).

Given the relatively small number of daily vehicle trips, vehicular emissions would be minimal. Furthermore, the number of peak-hour trips would be minimal, thus the effect of DWSP-related traffic on local CO concentrations along roadways and at intersections would be minimal.

California has identified diesel particulates as a carcinogen and has an aggressive state-wide program. The projected emission benefits associated with the full implementation of this plan, including proposed federal measures, are reductions in diesel particulate emissions and associated cancer risks by 75 percent by 2010 and 85 percent by 2020 (CARB, 2000b). Because the DWSP would cause minimal diesel emissions (probably not greater than 10 project related diesel truck trips per day and a weekly one-hour test of the emergency generator), the DWSP would not substantially increase toxic risks to adjacent receptors.

Therefore, the operational impact would be less than significant with implementation of Mitigation Measure Air-2.

Mitigation Measure AIR-2: The WTP shall be designed so that each piece of equipment operates in compliance with applicable Valley Air District permit requirements and regulations including the Authority to Construct and the Permit to Operate. The equipment used, particularly the pumps and diesel generators, shall be operated as per the Valley Air District permit requirements and regulations.

Significance After Mitigation: Less than significant.

Impact AIR-3: Operation of DWSP facilities could result in odors. No impact for all DWSP facilities.

Because offensive odors rarely cause any physical harm and no requirements for their control are included in the state or federal air quality regulations, the Valley Air District has no specific rules or standards related to odor emissions. Instead, any actions related to odors are based on citizen complaints to the local government and the Valley Air District. During operation the DWSP facilities would not generate odors.

Operation of the intake facility would predominantly include maintenance of pumps, fish screens, and other equipment at the facility. These activities may involve use of vehicles and/or maintenance equipment when necessary. These activities would not involve emissions of odors. Further, pumping operations would be within fully enclosed structures and due to their nature would not result in odor generation. Therefore, there would be no impact.

The raw water and treated water pipelines would be buried and would not result in odor emissions. Pumping operations at the pump stations would be within fully enclosed structures and due to their nature would not result in odor generation. Therefore, there would be no impact.

WTPs are not documented sources of odors in the Valley Air District *GAMAQI*. The treatment chemicals used in the proposed water treatment processes would be stored in an enclosed building and would not generate odors off-site.

Water treatment residuals would be generated during the treatment process. The residuals would be mostly inert, containing the particles removed from the raw water (primarily silt and clay) and aluminum hydroxide produced during coagulation. The residuals would be dried on-site in solids drying beds and hauled off-site for disposal. None of these processes would generate odors. Therefore, no odors would be generated by the WTP.

Mitigation: No mitigation is required.

3.6.3 REFERENCES

California Air Resource Board (CARB). 2000a. California's Emissions Inventory for Off-Road Large Compression-Ignited (CI) Engines (> 25 HP). MSC#99-32, Appendix D, dated January 10, 2000. Available at: http://www.arb.ca.gov/msei/off-road/pubs.htm, website updated September 2004.

California Air Resources Board (CARB). 2000b. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. Available at: http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf.

California Air Resources Board (CARB). 2003a. Available at http://www.arb.ca.gov/aqs/aaqs2.pdf.

California Air Resource Board (CARB). 2003b. EMFAC2002, Version 2.2, released April 23, 2003. Available at : http://www.arb.ca.gov/msei/on-road/latest_version.htm, website updated April 2004.

California Air Resource Board (CARB). 2003c. URBEMIS2002 User's Guide, Appendix G, May 2003. Available at: http://www.arb.ca.gov/planning/urbemis/urbemis2002/urbemis2002.htm, website updated August 2004.

California Air Resources Board (CARB). 2004. Air Quality Data Summaries. Available at http://www.arb.ca.gov/adam.

City of Stockton. 1990. City of Stockton General Plan: Policy Document. Adopted January 22, 1990; last amended November 3, 1998.

Montgomery Watson Harza (MWH). 2005a. Intake Capacity and Phasing Analysis Technical Memorandum. City of Stockton Delta Water Supply Project. Prepared for the City of Stockton Municipal Utilities Department. March 2005.

Montgomery Watson Harza (MWH). 2005b. Raw Water Pipeline Alignment Recommendations Technical Memorandum. City of Stockton Delta Water Supply Project. Prepared for the City of Stockton Municipal Utilities Department. March 2005.

Montgomery Watson Harza (MWH). 2005c. Water Treatment Plant Conceptual Process and Layout Technical Memorandum. City of Stockton Delta Water Supply Project. Prepared for the City of Stockton Municipal Utilities Department. March 2005.

Montgomery Watson Harza (MWH). 2005d. Treated Water Pipeline Project Description Technical Memorandum. City of Stockton Delta Water Supply Project. Prepared for the City of Stockton Municipal Utilities Department. March 2005.

San Joaquin County. 1992. San Joaquin County General Plan 2010. Adopted July 29, 1992. Available at http://ceres.ca.gov/planning/counties/San_Joaquin/plans.html

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2002a. Guide for Assessing and Mitigating Air Quality Impacts, Technical Document, Information for Preparing Air Quality Section in EIRs, Public Draft.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2002b. Guide for Assessing and Mitigating Air Quality Impacts, Public Draft.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2003. PM_{10} Plan. Available at: http://www.valleyair.org/Air_Quality_Plans/ AQ_plans_PM_2003PlanTOC.htm

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2004a. Ambient Air Quality Standards & Valley Attainment Status. Available at: http://www.valleyair.org/aqinfo/attainment.htm

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2004b. 1994 Ozone Attainment Demonstration Plan. Available at: http://www.valleyair.org/Air_Quality_Plans/AQ_plans_Ozone_official.htm#1-Adopted%20plans

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2004c. 2000 Triennial Plan. Available at: http://www.valleyair.org/Air_Quality_Plans/AQ_plans_Ozone_official.htm#1-Adopted%20plans

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2004d. Rule 9110 General Conformity. Available at: http://www.valleyair.org/rules/1ruleslist.htm

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2004e. Particulate Matter. $PM_{2.5}$ Status. New Health-Based Ambient Air Quality Standards. Available at: http://www.valleyair.org/Air_Quality_Plans/AQ_plans_PM.status2.5.htm

San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). 1992. Rule 4102. Nuisance. Adopted May 21, 1992. Amended December 17, 1992.

San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). 1994. Rule 9110, General Conformity. Adopted October 20, 1994.

San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). 2001. Attainment Plan Update, Valley Air News, May 2001.

San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). 2004. Rule 8021. Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities. Adopted November 2001 and amended August 2004.

Western Regional Climate Center (WRCC). 2004. Climate Data Summary for Stockton, California. Available at http://www.wrcc.dri.edu/cgi-bin/clilcd.pl?ca23237

3.7 NOISE

This section describes the existing noise environment in the project area, and potential noise impacts from construction and operation of the DWSP. This analysis uses typical construction equipment noise levels to estimate corresponding noise levels at the nearest residences. Long-term operation impacts are based on estimates of noise increases from similar noise sources.

3.7.1 SETTING

NOISE BACKGROUND

Noise is defined as unwanted sound. Pressure waves traveling through air exert a force registered by the human ear as 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.

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 each measured Hz and corresponding sound power level. The audible sound spectrum consists of a range of frequencies spanning 20 to 20,000 Hz. Therefore, the sound pressure level 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 (20 to 20,000 Hz). 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 decreased sensitivity of the human ear to low and extremely high frequencies instead of the frequency mid-range. 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 method of frequency de-emphasis and is typically applied to community noise measurements. In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve.

Noise Exposure and Community Noise

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. 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. Community noise is constantly changing throughout the day due to short duration single event noise sources, such as aircraft flyovers, vehicle passbys, sirens, etc. These successive additions of sound to the community noise environment vary the community noise level from instant to instant. This requires 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 (Caltrans, 1998):

L_{eq}: 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 L_{eq} 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).

L_{max}: the instantaneous maximum noise level for a specified period of time.

L_{10}: the noise level that is equaled or exceeded 10 percent of the specified time period. The L_{10} is often considered the maximum noise level averaged over the specified time period.

L_{90}: the noise level that is equaled or exceeded 90 percent of the specified time period. The L_{90} is often considered the background noise level averaged over the specified time period.

L_{dn}: 24-hour day and night A-weighed 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 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dB to take into account the greater annoyance of nighttime noises.

CNEL: similar to the L_{dn}, the Community Noise Equivalent Level (CNEL) adds a 5 dB "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10 dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

Effects of Noise on People

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

1. subjective effects of annoyance, nuisance, dissatisfaction;
2. interference with activities such as speech, sleep, learning; and
3. physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial settings can experience noise in the last category. A satisfactory method for measuring the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction does not exist. However, a wide variation in individual thresholds of annoyance does exist, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted, i.e., the "ambient noise" level.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise would be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 1998):

- 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 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 nonlinear 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 dB, the combined sound level would be 53 dB, not 100 dB. Because of this sound characteristic, if two noise emission sources, one producing a noise level greater than 9 dB than the other, the contribution of the quieter noise source is negligible and the sum of the noise sources is that of the louder noise source.

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 at 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).

EXISTING NOISE SOURCES

This section lists the existing noise sources in the project area with respect to the DWSP facilities.

Intake Facility

Existing noise sources in the vicinity of the proposed intake facility include vehicles driving to and from the proposed intake site for recreational purposes on the San Joaquin River, occasional recreational motorized watercraft, and large ships on the San Joaquin River. In addition, agricultural equipment and activities in the adjacent agricultural fields contribute to background noise levels.

Raw and Treated Water Pipelines

Existing noise sources along the raw and treated water pipeline alignments include vehicles traveling on the Empire Tract Road, Eight Mile Road, and Lower Sacramento Road. Area noise sources also include agricultural practices, particularly farming equipment activities north and south of the Eight Mile Road, east of Empire Tract Road, and west of Lower Sacramento Road near the WTP site. Vehicular traffic on Davis Road and West Lane is also a source of noise near the treated water pipeline alignment.

Water Treatment Plant

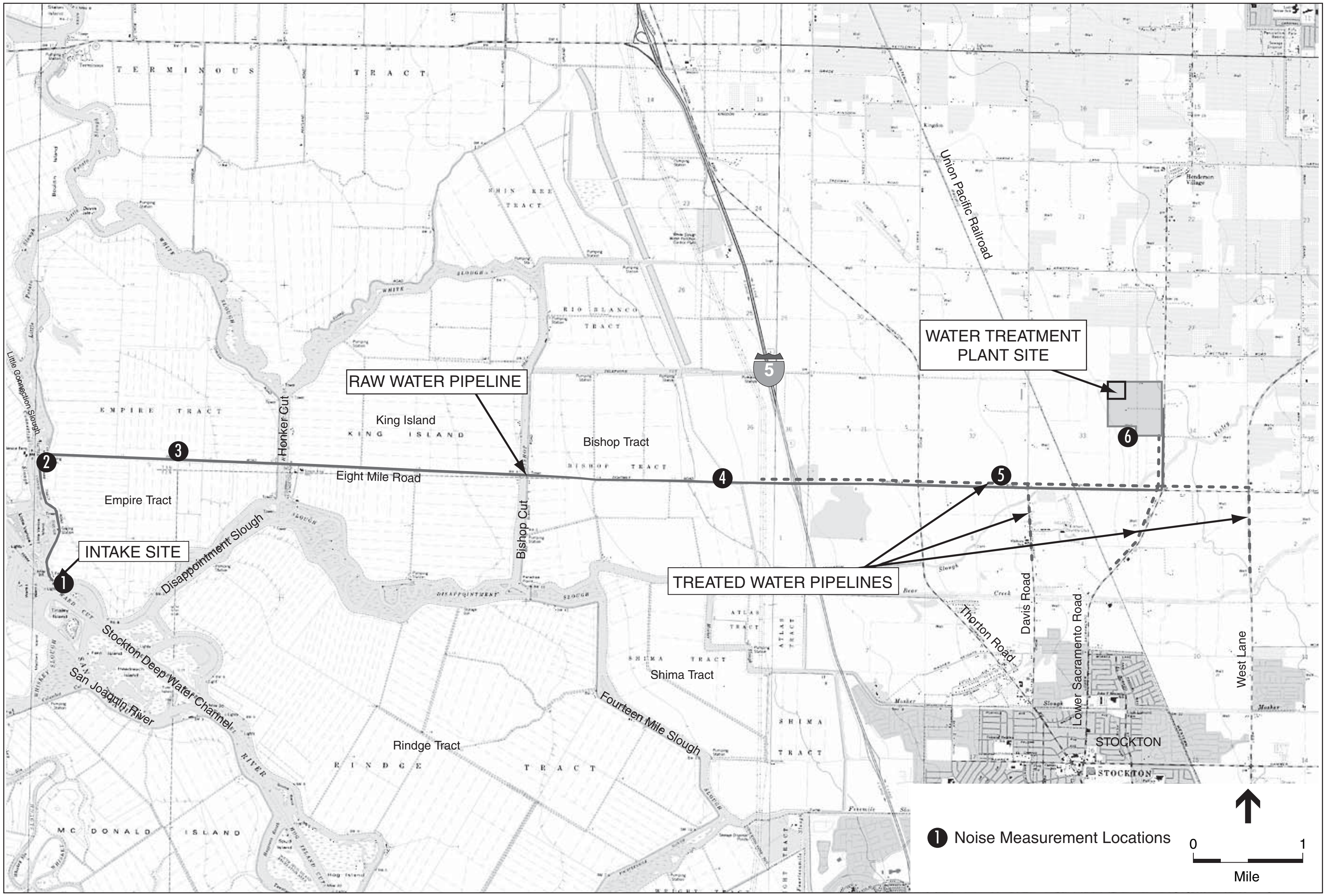
Existing noise sources include vehicles traveling on Lower Sacramento Road and agricultural practices west of Lower Sacramento Road.

Short-term Measurements

On May 13, 2004, six short-term noise measurements were taken to sample existing noise levels in the project area. The results are included in Table 3.7-1. Figure 3.7-1 shows the locations where the noise measurements were taken.

TABLE 3.7-1
EXISTING NOISE LEVELS NEAR PROJECT AREA

Location	L_{eq} (dBA)	L_{max} (dBA)	Noise Source
Site 1: Intake facility site.	60	74	Occasional recreational vehicles, trucks, and watercraft. Birds and wind.
Site 2: Intersection of Empire Tract Road and Eight Mile Road.	56	70	Occasional vehicles.
Site 3: Unnamed drain on Eight Mile Road, approximately 0.5–0.75 mile from intersection of Eight Mile Road and Empire Tract Road.	58	79	Occasional vehicles.
Site 4: Approx. 20 feet from center of Eight Mile Road near Spanos Park West residences.	60	77	Traffic.
Site 5: Approx. 1 mile west from intersection of Eight Mile Road and Davis Road.	73	87	Traffic. Included a large truck at 81 dBA and cars at 78 dBA.
Site 6: Perimeter of parcel containing WTP site.	46	58	Birds and wind.



SOURCE: USGS 7.5 Minute Quadrangles (Bouldin Island, Terminous, and Lodi South); and Environmental Science Associates, 2005

Figure 3.7-1
Noise Measurement Locations

SENSITIVE RECEPTORS

Some land uses are considered more sensitive to ambient noise levels than others, sensitivity being a function of noise exposure (in term of both exposure duration and insulation from noise) and the types of activities involved. Residential land uses are generally more sensitive to noise than commercial and industrial land uses. Figure 3.2-1 in Section 3.2, Land Use, Recreation, and Aesthetic Resources illustrates the location of various land uses in the project area, including sensitive receptors.

Sensitive receptors in the vicinity of the project area include residences on the islands west of the Empire Tract Road, residences and business rental units located at the intersection of the Empire Tract Road and Eight Mile Road, and several residential neighborhoods on Eight Mile Road near I-5 and Davis Road. The closest residence to the intake facility is located at approximately 1,050 feet northwest of the site. The closest residence to the proposed WTP site is approximately 1,050 feet southeast of the northwest corner of the WTP site. A few residential and commercial units exist near the area of the Davis Road spur and the urban area of the City where the treated water pipeline alignment connects to the existing distribution system. Bear Creek Church is located on Lower Sacramento Road slightly north of Eight Mile Road and directly south of the WTP site.

REGULATORY SETTING

San Joaquin County

San Joaquin County regulates noise through implementation of its General Plan Public Health and Safety Element (San Joaquin County, 1992). In the Public Health and Safety Element, land use compatibility goals are established for noise sensitive residential receptors. Applicable policies include the following:

Policy 1. The following exterior noise levels shall be considered acceptable:

(c) Hourly equivalent sound level from stationary noise sources shall be 50 dB during the daytime and 45 dB during the nighttime for outdoor activity areas for residential development; health-related facilities; community assembly facilities, etc.

(d) Maximum sound level from stationary noise sources shall be 70 dB during the daytime and 65 dB during the nighttime for outdoor activity areas for residential development; health-related facilities; community assembly facilities, etc.

Policies 4. Development shall be planned and designed to minimize noise impacts on neighboring noise sensitive areas and to minimize noise interference from outside noise sources.

6. The county shall seek to alleviate existing community noise problems.

The Noise Ordinance (Section 9-1025.9) of the San Joaquin County Code regulates noise from stationary sources as shown in Table 3.7-2.

TABLE 3.7-2
MAXIMUM ALLOWABLE NOISE
EXPOSURE STATIONARY NOISE SOURCES

	Outdoor Activity Areas[1]	
	Daytime[2] (7:00 AM to 10:00 PM)	**Nighttime[2] (10:00 PM to 7:00 AM)**
Hourly Equivalent Sound Level (L_{eq}), dBA	50	45
Maximum Sound Level (L_{max}), dBA	70	65

[1] Where the location of outdoor activity areas in unknown or is not applicable, the noise standard shall be applied at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards shall be applied on the receiving side of noise barriers or other property line noise mitigation measures.

[2] Each of the noise level standards specified shall be reduced by 5 dBA for impulsive noise, single tone noise, or noise consisting primarily of speech or music.

Noise sources associated with construction activities are exempt from the provisions of the Noise Ordinance between the hours of 6:00 a.m. and 9:00 p.m. on any day. Any stationary noise activity whose regulation has been preempted by state or federal law is also exempt.

City of Stockton

The City of Stockton General Plan (1990) sets two goals for noise:

Goal 1: Protect the citizens of the Stockton Planning Area from the harmful and annoying effects of exposure to excessive noise.

2: Protect the economic base of the Stockton Planning Area by preventing incompatible land uses from encroaching upon areas with existing noise-producing uses.

Policies 6 through 8 govern noise generated by commercial and industrial uses. These policies require that noise produced by commercial uses shall not exceed 75 dB L_{dn}/CNEL at the nearest property line, and that noise produced by industrial uses shall not exceed 80 dB L_{dn}/CNEL at the nearest property line.

Stockton Municipal Code

The Noise Standards (Division 16-340) of the Stockton Municipal Code, regulates noise for noise-sensitive land uses as shown in Table 3.7-3.

TABLE 3.7-3
MAXIMUM ALLOWABLE NOISE
EXPOSURE FOR NOISE-SENSITIVE LAND USES

Noise Level Descriptor	Outdoor Activity Areas[1]	
	Day (7:00 AM to 10:00 PM)	**Night (10:00 PM to 7:00 AM)**
Hourly Equivalent Sound Level (L_{eq}), dBA	55	45
Maximum Sound Level (L_{max}), dBA	75	65

[1] The noise standard shall be applied at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards shall be applied on the receiving side of noise barriers or other property line noise mitigation measures.
[2] Each of the noise level standards specified shall be increased by 5 dBA for impulse noise, simple tone noise, or noise consisting primarily of speech or music.

3.7.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

CEQA defines a significant effect on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. A noise impact would be considered significant if it would result in any of the following, which are adapted from the CEQA Guidelines, Appendix G:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, 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 levels existing without the project;
- 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 expose people residing or working in the project area to excessive noise levels;
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

Based on the potential DWSP impacts and the City and County noise standards (City of Stockton, 2004; San Joaquin County, 1992), the following conditions would constitute a significant noise impact, if:

- The project generated an incremental increase of 3 dBA Ldn or greater to exterior or interior noise levels.
- Project-generated noise levels are above standards for the local jurisdiction (the City).
- Based on City standards, the Lmax produced by industrial land uses or by permitted noise-generating activities on any industrial or public facilities zoning district shall not exceed 80 dBA; and the Leq from these land uses shall not exceed 70 dBA during daytime and nighttime hours as measured at the property line.
- Nighttime construction (10:00 p.m. to 7:00 a.m.) cause interior noise levels at nearby residences or other sensitive receptors to exceed 45 dBA, L_{eq}.

METHODOLOGY

Construction noise impacts are based upon an assumed mixture of construction equipment and related noise levels. Noise levels of individual types of equipment are based on industry research papers and monitoring of long-term construction projects. Assumptions related to construction equipment mixture and industry noise averages were used to evaluate construction-related noise impacts. In addition, because the DWSP facilities would not be located within two miles or in the vicinity of a public airport or a private airstrip, thresholds (e) and (f) are not discussed further in this analysis.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.7-4 provides a summary of the significant and less than significant noise impacts associated with specific components of the DWSP.

TABLE 3.7-4
SUMMARY OF IMPACTS – NOISE

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
NOISE-1: Construction of DWSP facilities could temporarily increase noise levels at sensitive receptors.	LSM	LSM	LSM	LSM	LSM
NOISE-2: Operation of the intake facility and WTP could increase noise levels at nearby sensitive receptors.	LSM	LSM	NI	LSM	NI

LSM = Less than Significant Impact with Mitigation
NI = No Impact

IMPACT STATEMENTS AND MITIGATION MEASURES

Impact Noise-1: Construction of DWSP facilities could temporarily increase noise levels at sensitive receptors. Less than significant with mitigation for all DWSP facilities.

Typical construction noise levels are shown in Table 3.7-5. Table 3.7-6 assumes operation of various types of construction equipment.

TABLE 3.7-5
TYPICAL CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Level (dBA, L_{eq})*
Ground Clearing	84
Excavation	89
Foundations	78
Erection	87
Finishing	89

* Average noise levels 50 feet from the noisiest source and 200 feet from the rest of the equipment associated with a given construction phase. Noise levels correspond to public works projects in a typical suburban ambient noise environment (50 dBA ambient environment).

SOURCE: Bolt, Beranek and Newman, Inc., 1971.

TABLE 3.7-6
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA at 50 feet)
Dump Truck	88
Portable Air Compressor	81
Concrete Mixer (Truck)	85
Scraper	88
Dozer	87
Paver	89
Generator	76
Pump	76
Pile Driver	101
Backhoe	85

SOURCE: Cunniff, 1977.

Intake Facility

Construction of the intake facility would require approximately 17 months. Associated activities would consist of several distinct phases, including site preparation (grading and grubbing), excavation, foundation, erection, and finishing. Table 3.7-5 presents typical noise levels for the various phases.

Construction at the intake site would occur approximately 1,050 feet from the nearest residence to the northwest. As listed in the table above, pile driving and paving or finishing would cause the highest noise levels of 101 dBA and 89 dBA, respectively. These noise levels would result in attenuated noise levels of about 68 and 56 dBA, respectively, at the nearby residence, as a result of a reduction of 7.5 dBA per doubling of distance from a reference point of 50 feet. Construction of the intake facility could potentially increase noise levels at sensitive receptors. This impact would be reduced to less than significant with implementation of Mitigation Measure Noise-1.

Raw and Treated Water Pipelines

Except for special crossings, construction would include trenching, pipe installation, and backfilling of open trenches. Trenchless construction techniques such as jack and bore, microtunneling, or directional drilling would be employed at sensitive crossings, e.g., Bishop Cut and Honker Cut. Pipeline installation along Eight Mile would occur at a rate of 350 feet per day west of I-5 and at 200 feet per day east of I-5.

Noise generated would vary along pipeline reaches depending upon the amount and types of equipment required. The noisiest construction activities would involve the excavation and backfilling of trenches along with pile driving of the shore trenched. For residences within 50 feet of construction activities, noise levels could reach 89 dBA, L_{eq} for excavation and backfilling, and 101 dBA, L_{eq} for pile driving. At an installation rate of 200 to 350 feet per day, periods of intrusive noise exposure would be of limited duration, i.e., on average a few days, including the time required for alignment preparation, trenching, pipe laying, backfilling, and restoration.

In addition to actual pipe installation, approximately four periodic staging areas up to several acres in size would be needed along the alignment. Pipe, equipment, and other construction related items would be stored at these staging areas. These staging areas could be considerable sources of noise, particularly if equipment is accessed and moved during nighttime hours when individuals are sensitive to intrusive noise. The exact number, size, and location of the staging areas would be determined by the selected contractor, with direction from the City. Some staging areas would stay in operation throughout the duration of pipeline construction period, approximately one to 1.5 years. Other staging areas would be temporary and would move with progression of construction along the pipeline alignment. This impact would be reduced to less than significant with implementation of Mitigation Measure Noise-1.

Water Treatment Plant

Construction of the WTP facilities is expected to last 12 to 13 months. Associated activities would consist of several distinct phases, including site preparation (clearing and grubbing); excavation and sitework; structural facilities; electrical, process mechanical, and instrumentation; paving and striping; architectural and landscaping, and startup and testing. Construction equipment would include bulldozers, backhoes, tractors, graders, tractors, excavator, trenchers, compactors, and trucks. Typical noise levels for these construction phases are provided in Table 3.7-5.

Existing residences, occurring approximately 1,000 feet from the proposed WTP site, would be exposed to varying levels of construction noise. As shown in Table 3.7-5, excavation and finishing activities would constitute the noisiest phases of WTP construction. Assuming an attenuation rate of 6 to 7.5 dBA per doubling of distance from a reference point of 50 feet, the highest noise level, 101 dBA generated by a pile driver, would be reduced to approximately 68 dBA at 1,000 feet. This impact would be reduced to less than significant with implementation of Mitigation Measure Noise-1.

Mitigation Measure Noise-1a: Construction shall be limited to the hours of 7:00 a.m. to 10:00 p.m.

Mitigation Measure Noise-1b: The City shall require in construction specifications that the contractor select staging areas as far as reasonably feasible from existing residences. Activities within these staging areas shall conform to the time limitations established in Mitigation Measure Noise-1a.

Mitigation Measure Noise-1c: The City shall require in construction specifications that the contractor maintain all construction equipment with manufacturers' specified noise muffling devices.

Mitigation Measure Noise-1d: The City shall require in construction specifications that the contractor place all stationary noise generating construction equipment as far away as reasonably feasible from sensitive receptors or in an orientation minimizing noise impacts (i.e., behind existing barriers or storage piles, etc.).

Mitigation Measure Noise-1e: The City shall develop a haul route plan to direct construction traffic away from residential areas where feasible alternative routes exist.

Significance After Mitigation: Less than significant.

Impact Noise-2: Operation of the intake facility and WTP could increase noise levels at nearby sensitive receptors. Less than significant with mitigation for the intake facility and WTP.

Intake Facility

Pumps would lift water from the intake facility and deliver it to the WTP. Without noise insulation, the pumps at the intake facility would raise the ambient noise level above the City standard at a considerable distance from the pump location. The City Leq for industrial land uses and public facilities during the daytime and nighttime is 70 dBA at the property line; the City Lmax for industrial land uses and public facilities is 80 dBA. Therefore, since the pumps would be stationary sources, noise generated by the pumps would be limited to 70 dBA at the property line during the day and at night.

Table 3.7-7 is a compilation of the noise levels of various large pumps measured at 50 feet from the pumps. If similar pumps are used at the intake facility, to achieve a 70 dBA noise level at the property line, a noise enclosure would be required to reduce the pump noise levels.

Water Treatment Plant

Potential operational noise impacts at the WTP would primarily be from fixed stationary equipment. Because the WTP is in conceptual design, the equipment has not been selected. Therefore, vendor specifications with respect to noise generation are not available. As such, quantification of noise generated cannot be accurately determined. Therefore, operational noise impacts were evaluated qualitatively with reference to the City's noise level requirements and noise performance standards are suggested in Mitigation Measure Noise-2.

The proposed DWSP would initially include the operation of a 30 mgd WTP that would ultimately be expanded to 160 mgd. Noise-generating equipment at the WTP would include blowers, generators, pumps, process motors, and heavy trucks delivering chemical supplies and materials. The treated water pump station would be located at the greatest depth, 30 feet below the surface. The diesel backup generators and the treated water pump station would be located inside buildings to reduce noise emissions. Minor noise associated with low power equipment (e.g., sludge collectors, flocculators, pumps, etc.) and water flow noise would occur.

The level of noise generated by pumps and other stationary equipment would depend on four major variables:

(1) characteristics of the noise source (e.g., the technology type, rated horsepower, revolutions per minute (rpm), presence or absence of pure tones, directional characteristics of the noise source, presence or absence of acoustical design features);

(2) number of noise sources clustered together;

(3) type and effectiveness of building enclosure; and

(4) operational characteristics (e.g., constant 24-hour operation, intermittent operation, variable settings at different times).

The types of building enclosures and noise attenuation effectiveness of the enclosures have not yet been determined. Noise measurements taken at other water treatment facilities to measure pump noise are presented in Table 3.7-7. As indicated in this table, different pump types can have different noise ranges, with vertical turbine pumps generating noise levels in the upper end of the range. The pumps located underground would be relatively easy to shield and should not affect nearby sensitive receptors.

TABLE 3.7-7
NOISE LEVELS GENERATED BY PUMPS

Pump Specifications/Characteristics	Number of Pumps	Noise Level	Reference at 50 Feet
Marin Municipal Water District, Ignacio Pump Station 150 Hp, 1,800 rpm	2	78 dBA at 32 feet	74 dBA
Mesa Consolidated Water District, South Coast Pump Station 100 Hp, 2,100 rpm	1	66 dBA at 80 feet	70 dBA
Mesa Consolidated Water District, Sunflower Pump Station 100 Hp, 2,100 rpm	1	63 dBA at 104 feet	69 dBA
Irvine Ranch Water District 125 Hp, 2,000 rpm	1	75 dBA at 30 feet	71 dBA
General Category	1	76 dBA at 50 feet	76 dBA

Source: Environmental Science Associates, 1999.

Emergency diesel generators may also be located at the WTP. While the size and type of generators and the design of the building enclosure have not been specified, noise measurements taken at other emergency generators indicate that exterior noise level of 85 dBA at 50 feet would be generated if acoustical enclosure is not provided. With a surrounding masonry buffer, or with generator placement using other structures as shielding, the effective noise level may be reduced by 10 to 15 dBA at 50 feet. Since emergency generators would operate infrequently (only during periodic testing and during power outages), they would not contribute substantially to the overall average noise exposure outside the WTP site boundary. Emergency generators are typically tested during midday for no more than one hour per week.

Without the inclusion of noise reduction measures in the design and operation of the WTP, noise from the WTP would increase ambient noise levels in areas beyond the WTP site boundary above

County standards. This impact would be reduced to less than significant with implementation of Mitigation Measure Noise-2.

Mitigation Measure Noise-2: The design of the WTP and intake structure shall ensure that operational noise levels at the property line do not exceed a noise level of 70 dBA from the stationary equipment sources. Shielding and other specified measures as deemed appropriate and effective by the design engineer to comply with this performance standard shall be incorporated in final WTP and intake facility designs. Noise reduction measures may include, but are not necessarily limited to:

- Incorporation of equipment enclosures, fan silencers, mufflers, acoustical louvers, noise barriers, acoustical panels, etc.;
- Location of particularly noisy equipment as far away as feasibly possible from the property line and away from surrounding sensitive land uses;
- Orientation of acoustical exits away from sensitive receptors; and
- Incorporation of buildings, landscaping, where possible, to absorb and/or redirect noise.

Significance After Mitigation: Less than significant.

3.7.3 REFERENCES

Bolt, Beranek and Newman, Inc. 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*. (NTID 300.1). U.S. Environmental Protection Agency. U.S. Government Printing Office, Washington, D. C.

California Department of Transportation (Caltrans). 1998. Technical Noise Supplement. October 1998.

City of Stockton. 1990. City of Stockton General Plan: Policy Document. Adopted January 22, 1990; last amended November 3, 1998.

City of Stockton. 2004. Noise Standards. Division 16-340. Stockton Municipal Code. Available at: http://www.stocktongov.com/SMC/Chapter16/Article03/Division16-340.pdf

Cunniff, P. R. 1977. Environmental Noise Pollution. John Wiley & Sons, New York.

Environmental Science Associates. 1999. Environmental Impact Report for South County Surface Water Supply Project. Prepared for South San Joaquin Irrigation District.

San Joaquin County. 1992. San Joaquin County General Plan 2010. Adopted July 29, 1992.

San Joaquin County. 1999. San Joaquin County Code, Section 9-1025.9, Noise.

U.S. Environmental Protection Agency (USEPA). 1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.

3.8 HAZARDOUS MATERIALS / PUBLIC HEALTH

This section addresses the existing conditions in the project area, the potential of encountering hazardous materials during construction activities, and the potential hazardous materials and public health issues related to the operation of the DWSP. This section also describes the regulatory setting applicable to environmental protection and health and safety.

3.8.1 SETTING

HAZARDOUS MATERIALS

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. Title 22 of the CCR defines a hazardous material as:

> "a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed" (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10).

Hazardous wastes are defined in the same manner. Hazardous wastes are hazardous materials that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal. According to Title 22 of the CCR, hazardous materials and hazardous wastes are classified according to four properties: toxic, ignitable, corrosive, and reactive (CCR, Title 22, Chapter 11, Article 3). Toxicity, ignitability, corrosivity, and reactivity are defined in the CCR, Title 22, Sections 66261.20 through 66261.24, as summarized below:

- Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability, or death. For example, toxic substances can cause disorientation, acute allergic reactions, asphyxiation, skin irritation, or other adverse health effects if human exposure exceeds certain levels that depend on the substances in question. Carcinogens (substances known to cause cancer) are a special class of toxic substances (e.g., pesticides, heavy metal ions, etc.).

- Ignitable substances (e.g., gasoline and methane gas) are hazardous because of their ability to burn.

- Corrosive materials (e.g., chlorine gas, sulfur dioxide gas, and strong acids and bases) can cause severe burns or damage materials.

- Reactive materials (e.g., dynamite and pressurized gases) may cause explosions or generate toxic gases.

Toxic, ignitable, corrosive, and reactive materials are types of hazardous materials. A chemical that poses a significant hazard upon a single exposure is considered acutely hazardous if it is so designated by a regulatory agency (California Health and Safety Code, Section 25531). A hazardous waste is any hazardous material that is discarded, abandoned, or to be recycled. The criteria that render a material hazardous also make a waste hazardous (California Health and Safety Code, Section 25117).

Factors that influence the health effects of exposure to a hazardous material include the dose to which the person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility.

EXISTING CONDITIONS

The predominant land use in the project area is agriculture. Therefore, hazardous materials presently used in the project area are limited to those hazardous materials common to agriculture, including pesticides, fertilizers, and fuels. Historic hazardous materials use likely involved the application of pesticides on agricultural areas of the project area, including most of the raw and treated water pipeline alignments and the proposed WTP site.

A limited regulatory agency records search was performed for areas within the project area. The records search included the CVRWQCB's List of Spill and Leak Sites (SLIC) (CVRWQCB, 2004a); the CVRWQCB's List of Leaking Underground Storage Tank (LUST) (CVRWQCB, 2004b); and the State of California's Cortese list maintained by the California Department of Toxic Substances Control (DTSC). The Cortese list is a compilation of information from various sources listing potential and confirmed hazardous waste and hazardous substances sites in California. The limited regulatory agency database search resulted in the identification of two contaminated sites in the vicinity of the proposed project area: Herman & Helen's Marina (H & H Marina) and King Island Resort.

Herman & Helen's Marina (H & H Marina)

H & H Marina is located just north of the intersection of Empire Tract Road and Eight Mile Road (15135 Eight Mile Road, Stockton, CA) (Figure 3.2-1). Three underground fuel storage tanks containing gasoline and diesel were removed from this site in 1991. Two aboveground storage tanks were installed at the site. The tanks are 12,000 gallon compartmentalized tanks containing gasoline, diesel, and oil. The RWQCB determined that the source of the methyl tertiary-butyl ether (MTBE) contamination was the aboveground storage tanks, and not the former underground storage tanks. The aboveground storage tanks are located approximately 100 feet north of Eight Mile Road. Groundwater depth was measured at 4.72 to 22.85 feet bgs; groundwater flow is to the east-southeast.

Fourteen groundwater monitoring wells have been installed on the site, and quarterly groundwater monitoring has been on-going since September 1997. According to the Groundwater Monitoring Report completed for the first quarter of 2004, groundwater and surface water samples from the drainage ditch and island drainage channel were analyzed for total petroleum hydrocarbons as gasoline (TPH-g), BTEX (benzene, toluene, ethylene, and xylene), MTBE, TAME (tertiary amyl methyl ether) and TBA (tertiary butanol). The drainage ditch runs north and south and flows underneath Eight Mile Road; the island drainage channel is located south of Eight Mile Road.

Soil samples collected from borings within Eight Mile Road and just north and south of the road contained MTBE and TAME. Groundwater samples obtained from those borings contained TPH-g, BTEX, and MTBE. Groundwater samples taken from the closest monitoring well, located approximately 60 feet north of Eight Mile Road, contained TPH-g, BTEX, MTBE, TAME, and TBA. Surface water samples collected from the drainage ditch and island drainage channel contained low concentrations of MTBE.

King Island Resort

King Island Resort (11530 Eight Mile Road, Stockton, CA) is located on Honker Cut between Eight Mile Road and Disappointment Slough. Three underground fuel storage tanks containing gasoline and diesel were removed from this site; one tank was removed in 1991 and two tanks were removed in 1999. Contamination was discovered in and around the levee area. Seven monitoring wells were installed at the site and groundwater monitoring for TPH-g, BTEX, and MTBE is ongoing. Groundwater depth was measured at two to 11 feet bgs; groundwater flow is to the east.

REGULATORY SETTING

This section describes the regulatory framework that governs hazardous substances and public health in the project area at the federal, state, and local levels.

Federal

Federal regulatory agencies include the USEPA, Occupational Safety and Health Administration (OSHA), Nuclear Regulatory Commission (NRC), Department of Transportation (DOT), and National Institutes of Health (NIH). The following represent federal laws and guidelines governing hazardous substances.

- Pollution Prevention Act (42 U.S. Code Section 13101 et seq. / 40 Code of Federal Regulations)
- Clean Water Act (33 U.S. Code Section 1251 et seq. / 40 Code of Federal Regulations)
- Oil Pollution Act (33 U.S. Code Section Sections 2701-2761 / 30, 33, 40, 46, 49 Code of Federal Regulations)
- Clean Air Act (42 U.S. Code Section 7401 et seq. / 40 Code of Federal Regulations)
- Occupational Safety and Health Act (29 U.S. Code Sections 651 et seq. / 29 Code of Federal Regulations)

- Federal Insecticide, Fungicide, and Rodenticide Act 7 U.S. Code Section 136 et seq. / 40 Code of Federal Regulations)
- Comprehensive Environmental Response Compensation and Liability Act (42 U.S. Code Section 9601 et seq. / 29, 40 Code of Federal Regulations)
- Superfund Amendments and Reauthorization Act Title III (42 U.S. Code Section 9601 et seq. / 29, 40 Code of Federal Regulations)
- Resource Conservation and Recovery Act (42 U.S. Code Section 6901 et seq. / 40 Code of Federal Regulations)
- Safe Drinking Water Act (42 U.S. Code Section 300f et seq. / 40 Code of Federal Regulations)
- Toxic Substances Control Act (15 U.S. Code Section 2601 et seq. / 40 Code of Federal Regulations)

At the federal level, the principal agency regulating the generation, transport and disposal of hazardous substances is the USEPA, under the authority of the Resource Conservation and Recovery Act (RCRA). The USEPA regulates hazardous substance sites under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Applicable federal regulations are contained primarily in Titles 29, 40, and 49 of the CFR.

State

Legislation at the state level allows state agencies to accept delegation of federal responsibility for hazardous materials and hazardous waste management. The Cal/EPA and the Office of Emergency Services (OES) of the State of California establish rules governing the use of hazardous substances. The SWRCB has primary responsibility to protect water quality and supply.

The Cal/EPA was created in 1991 to better coordinate state environmental programs, reduce administrative duplication, and address the greatest environmental and health risks. Cal/EPA unifies the state’s environmental authority under a single accountable, Cabinet-level agency. The Secretary for Environmental Protection oversees the following agencies: CARB, Integrated Waste Management Board, Department of Pesticide Regulation, SWRCB, Department of Toxic Substance Control (DTSC), and Office of Environmental Health Hazard Assessment.

Applicable State laws include the following:

- Porter Cologne Water Quality Control Act (California Water Code Section 13000–14076 / 23 California Code of Regulations)
- California Accidental Release Prevention Law (California Health and Safety Code Section 25531 et seq. / 19 California Code of Regulations)
- California Building Code (California Health and Safety Code Section 18901 et seq. / 24 California Code of Regulations)

- California Fire Code (California Health and Safety Code Section 13000 et seq. / 19 California Code of Regulations)
- California Occupational Safety and Health Act (California Labor Code Section 6300–6718/ 8 California Code of Regulations)
- Hazardous Materials Handling and Emergency Response “Waters Bill” (California Health and Safety Code Section 25500 et seq. / 19 California Code of Regulations)
- Hazardous Waste Control Law (California Health and Safety Code Section 25100 et seq. / 22 California Code of Regulations)
- Carpenter-Presley-Tanner Hazardous Substance Account Act “State Superfund” (California Health and Safety Code Section 25300 et seq. / California Revenue and Tax Code Section 43001 et seq.)
- Hazardous Substances Act (California Health and Safety Code Section 108100 et seq.)
- Safe Drinking Water and Toxic Enforcement Act “Proposition 65” (California Health and Safety Code Sections 25180.7, 25189.5, 25192, 25249.5-25249.13 / 8, 22 California Code of Regulations)
- California Air Quality Laws (California Health and Safety Code Section 39000 et seq. / 17 California Code of Regulations)
- Aboveground Petroleum Storage Act (California Health and Safety Code Section 25270 et seq.)
- Pesticide Contamination Prevention Act (California Food and Agriculture Code Section 13141 et seq. / 3 California Code of Regulations)
- Underground Storage Tank Law “Sher Bill” (California Health and Safety Code Section 25280 et seq. / 23 California Code of Regulations)

Groundwater Regulatory Background

Acting through the CVRWQCB, the SWRCB regulates surface and groundwater quality pursuant to the Porter-Cologne Water Quality Act, the federal Clean Water Act, and the Underground Tank Law. Under these laws, the CVRWQCB is authorized to supervise the cleanup of hazardous wastes sites referred to it by local agencies in those situations where water quality may be affected.

Depending on the nature of contamination, the lead agency responsible for the regulation of hazardous materials at the site can be the DTSC, CVRWQCB, or both. DTSC evaluates contaminated sites to ascertain risks to human health and the environment. Sites can be ranked by DTSC or referred for evaluation by the CVRWQCB.

Local

San Joaquin County and the City have regulatory agencies responsible for implementing numerous regulations, which oversee hazardous materials transport, distribution, use, storage, and disposal. These agencies and regulations are summarized in the following discussion.

San Joaquin County Public Health Services, Environmental Health Department

The Unified Hazardous Waste and Hazardous Management Regulatory Program (SB 1082, 1993) is a state and local effort to consolidate, coordinate, and make consistent existing programs regulating hazardous waste and hazardous materials management. Cal/EPA adopted implementing regulations for the Unified Program (CCR, Title 27, Division 1, Subdivision 4, Chapter 1) in January 1996. The Unified Program is implemented at the local level by Certified Unified Program Agencies (CUPAs).

The San Joaquin County Public Health Services, Environmental Health Department (SJCEHD) is the CUPA for all cities and unincorporated areas within San Joaquin County. The CUPA was created by the California legislature to minimize the number of inspections and different fees for businesses. The SJCEHD provides the management and record keeping of hazardous materials and underground storage tank (UST) sites for San Joaquin County, including the City. Through the Hazardous Materials Program, the SJCEHD inspects businesses for compliance with the Hazardous Waste Control Act. Hazardous waste is subject to storage time limits, disposal requirements and labeling requirements on containers.

The SJCEHD also issues permits to businesses that handle quantities of hazardous materials/ waste greater than or equal to 55 gallons, 500 pounds, or 200 cubic feet of a compressed gas at any time. Businesses who handle these quantities of hazardous materials/wastes are required to submit a Hazardous Materials Management Plan (HMMP) to the SJCEHD. The HMMP includes an inventory of hazardous materials and hazardous wastes, as well as an emergency response to incidents involving those hazardous materials and wastes.

Above-ground storage tanks over 660 gallons that contain petroleum products are inspected by the SJCEHD and are required to prepare a Spill Prevention Control and Countermeasures Plan (SPCCP). The SPCCP is kept on-site and is subject to inspection by the SWRCB. The SPCCP includes a requirement to prepare a response to a release of hazardous materials from above-ground storage tanks and to prevent a release. The SPCCP also identifies the requirement for secondary containment and mitigation measures.

Under a contract with the SWRCB, the SJCEHD conducts the Local Oversight Program to oversee the abatement and cleanup of releases of hazardous substances onto the ground or from USTs in San Joaquin County that do not involve chemical releases to water. The CVRWQCB is the lead agency responsible for chemical releases to water throughout the County. The Cal/EPA and the DTSC are responsible for overseeing the cleanup of hazardous waste sites in California.

San Joaquin County Office of Emergency Services

The San Joaquin County OES is responsible for effective planning for emergencies including those related to hazardous material incidents. The OES coordinates planning, response to emergencies, improves procedures for incident notification and provides training and equipment to safety personnel (City of Stockton, 1990). The California Health and Safety Code Section 25500 requires the OES to: (1) prepare an inventory and information system for the storage and location of hazardous materials in the County; (2) oversee the preparation and collection of plans for those businesses that use hazardous substances; (3) prepare area response plans that would incorporate inventory data, training for emergency responses and evacuation plans; and (4) present an inspection plan and data management plan for approval to the State.

San Joaquin County Plans and Policies

San Joaquin County prepared a Hazardous Waste Management Plan (HWMP) in November 1988. The City adopted this plan on January 9, 1989 (City of Stockton, 1990). The HWMP is intended to serve as the primary planning document for hazardous waste management in the County. The HWMP analyzes the hazardous waste situation within the County and makes recommendations. The recommendations within the HWMP encourage a variety of administrative programs to monitor and encourage hazardous waste reduction and to educate and inform hazardous waste generators and the public concerning hazardous waste problems. The HWMP also recommends that any Use Permit for a hazardous waste generator require the generator to implement a waste reduction program.

City of Stockton

The City's General Plan addresses issues of hazardous materials through the use of goals, policies and implementation measures outlined in the Safety Section of the General Plan Policy Document (City of Stockton, 1990). The following discussion outlines the City's goals and policies relevant to the project area.

Hazardous Material

Goal: Protect City residents from the risks involved in the transport, distribution, use, and storage of hazardous materials.

Policies:

1. Require proper storage and disposal of hazardous materials to prevent leakage, potential explosions, fires or the escape of harmful gases.

2. Cooperate with the County in the identification of hazardous material users (both large and small scale users) and in the development of an inspection process and an HMMP.

3. Jointly develop with San Joaquin County a household hazardous waste collection system.

4. Review the City's land use policies to maintain compatibility between hazardous material users and surrounding land use to insure public safety.

Emergency and Disaster Planning

Goal: Develop and maintain emergency preparedness programs and emergency health services in order to protect the public.

Policies:

1. Work with the County and other agencies to establish, maintain, and test a coordinated emergency response system to address a variety of hazardous and threatening situations.

2. Support and periodically update the various disaster plans concerning the City including the City's Emergency Operations Plan.

3. Major access and evacuation corridors should be available and unobstructed in case of major emergency or disaster.

4. Maintain water supply requirements for fire fighting needs in accordance with the Insurance Services Office "Guide for Determination of Required Fire Flow."

5. Continue to enforce minimum road widths and clearances around structures to promote fire and safety protection and access.

The Stockton General Plan and the land use planning process address emergency and disaster planning by trying to avoid such emergencies and disasters. The City has an Emergency Operations Plan that is designed to provide the basis for disaster response. The development of the Plan was overseen by an Emergency Planning Committee composed of representatives from the City's various departments. It is through the direction of the San Joaquin County OES that the City would respond to a disaster or emergency (City of Stockton, 1990).

City of Stockton Fire Department

The City's Fire Department (Fire Prevention Division) provides limited oversight of hazardous materials. The Fire Department is responsible for conducting inspections for code compliance and fire-safe practices, and for investigation of fire and hazardous materials incidents. The Fire Department regulates explosive and hazardous materials under the Uniform Fire Code, and permits the handling, storage, and use of any explosive or other hazardous material.

Risk Management Plans

Senate Bill 1889 requires businesses that handle threshold quantities of regulated substances on the Federal Accidental Release Prevention Program to submit Risk Management Plans (RMPs). Senate Bill 1889 also requires businesses that handle more than the threshold quantity of a state regulated substance that does not exceed the federal threshold to implement the Accidental Release Prevention Program upon request by the local government implementing agency. In cases where a CUPA has been established for a business, the CUPA would be the first contact.

The SJCEHD is the CUPA for San Joaquin County. The OES Hazardous Materials Division administers the RMP program which requires businesses that use specific extremely hazardous substances to prepare a comprehensive plan to reduce the risk of an accident.

An RMP includes safety information, hazard review, operating procedures, training, maintenance, compliance audits, and incident investigation. The RMP must consider the proximity to sensitive populations located in schools, residential areas, general acute care hospitals, long-term health care facilities, and child day care facilities. The RMP must also consider external events such as seismic activity.

3.8.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

A hazardous materials and/or public health impact would be considered significant if it would result in any of the following, which are adapted from the CEQA Guidelines, Appendix G:

- 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 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, the project would result in a safety hazard for people residing or working in the project area;
- For a project within the vicinity of a private airstrip, the project would 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.

METHODOLOGY

The presence of hazardous materials in the project area was determined through preliminary record searches and examination of readily available information. The absence of site-specific data does not indicate that hazardous materials are not present. The final determination that hazardous materials are present may require onsite field investigations.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.8-1 provides a summary of the hazardous materials and/or public health impacts associated with specific components of the DWSP.

TABLE 3.8-1
SUMMARY OF IMPACTS – HAZARDOUS MATERIALS / PUBLIC HEALTH

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
HAZ-1: Construction of the proposed DWSP facilities could result in the disturbance of contaminated soil and/or groundwater.	LS	LS	LSM	LS	LSM
HAZ-2: Construction of the proposed DWSP would involve the use and storage of hazardous materials such as gasoline and diesel fuels, oils, and solvents. Depending on the relative hazard of the hazardous material, if a spill of significant quantity were to occur, the accidental release could pose both a hazard to construction employees and the environment.	LSM	LSM	LSM	LSM	LSM
HAZ-3: Operation of the WTP could expose individuals to existing and/or potential future use of hazardous materials and generation of hazardous wastes.	NI	NI	NI	LSM	NI

LSM = Less than Significant Impact with Mitigation
LM = Less than-Significant Impact
NI = No Impact

IMPACT STATEMENTS AND MITIGATION MEASURES

Impact HAZ-1: Construction of the proposed DWSP facilities could result in the disturbance of contaminated soil and/or groundwater. Less than significant with mitigation for the raw and treated water pipelines. Less than significant for the intake facility and the WTP.

Intake Facility and WTP

Construction of DWSP facilities would involve excavation, soil stockpiling, and grading. Construction may result in possible worker contact with groundwater and surface water. A records search revealed no contaminated sites in the vicinity of the proposed intake site or WTP site. If contaminated soil and/or groundwater were encountered, appropriate jurisdictions will be notified and immediate containment and protection measures will be implemented. Therefore, the impact would be less than significant.

Raw and Treated Water Pipelines

Construction of the raw and treated water pipelines would involve excavation, soil stockpiling, grading, installation of the pipelines, and backfilling. Construction may result in worker contact with groundwater and surface water. Two contaminated sites (H & H Marina and King Island Resort) are located along Eight Mile Road. H & H Marina is located at the intersection of Eight Mile Road and Empire Tract Road; King Island Resort is located on Honker Cut between Eight Mile Road and Disappointment Slough. Extensive soil and groundwater contamination has been documented at these sites by the RWQCB and the San Joaquin County Environmental Health Division. Soil and groundwater contamination with TPH-g, BTEX, MTBE, TAME, and TBA have been found within and on either side of Eight Mile Road, where the proposed raw water pipelines would be installed. In addition, adjacent agricultural practices would have also resulted in soil and/or groundwater contamination from pesticides or other chemicals extending beneath the portions of the construction area. Construction activities would potentially uncover currently unknown contamination.

If contaminated soil and groundwater were encountered without taking proper precautions, the construction workers would be exposed to hazards that would potentially cause significant adverse health effects. Further, dewatering during construction would lead to extraction of contaminated groundwater. The quality of the groundwater would pose a concern if the water were discharged into a storm drain, sanitary sewer system, or surface water without treatment. Section 3.4, Drainage and Floodplain Management provides a further discussion of discharged groundwater. Individuals who accidentally ingest or come in direct contact with contaminated soil or groundwater would be at risk. Human health risks include exposure of on-site workers to chemicals in surface soil through incidental contact with the skin, ingestion of soil, inhalation of soil particles, or fumes during construction activities at contaminated sites, or adjacent property occupants or trespassers who come in contact with contaminated soil. This would be a potentially significant impact.

To lessen the possible impact to construction workers, Mitigation Measure HAZ-1 would ensure that regulatory agencies would be involved with remediation of contaminated areas within the construction area prior to any construction. In addition, the type of land uses would be restricted in areas of known contamination. A health and safety plan will be required prior to construction in areas with known contamination so that the appropriate precautions, e.g., no construction in heavily contaminated areas, appropriate level of safety gear worn by construction workers, etc., would be taken to ensure worker safety as well as the safety of adjacent property occupants. Implementation of Mitigation Measure HAZ-1 would reduce the impact to less than significant.

Mitigation Measure HAZ-1a: Prior to construction, the City shall conduct a Phase 1 Environmental Site Assessment according to ASTM protocol for intake and WTP sites and the pipeline alignments.

Mitigation Measure HAZ-1b: The City shall consult with the CVRWQCB to determine the precautions for installing the raw water pipelines within any area of contamination identified in the Phase 1 Environmental Site Assessment along Eight Mile Road. If soil and/or groundwater contamination are encountered, samples shall be collected prior to construction along the pipeline alignment in the area of known contamination to at least the depth of the proposed pipeline excavation. The samples shall be analyzed for the contaminants of concern identified for this area.

In addition, if any unidentified contaminated soil and/or groundwater are encountered or if suspected contamination is encountered during any construction activities, work will be halted in the area of potential exposure, and the type and extent of the contamination will be identified. A qualified professional, in consultation with the appropriate regulatory agencies, i.e., DTSC, CVRWQCB, SJCEHD, and the Stockton Fire Department, will then remediate the contamination and properly dispose of the contaminated material.

Significance After Mitigation: Less than significant.

Impact HAZ-2: Construction of the proposed DWSP would involve the use and storage of hazardous materials such as gasoline and diesel fuels, oils, and solvents. Depending on the relative hazard of the hazardous material, if a spill of significant quantity were to occur, the accidental release could pose both a hazard to construction employees and the environment. Less than significant with mitigation for all DWSP facilities.

During construction of the DWSP facilities, it is anticipated that limited quantities of hazardous substances, such as gasoline, diesel fuel, oils, solvents, and hydraulic fluid would be handled or used. Various contractors for fueling and maintenance purposes would use temporary bulk above ground storage tanks as well as storage sheds/trailers.

The proper handling and storage of hazardous materials would significantly decrease the chance for a release of the materials used during construction activities. Proper precautions and immediate clean-up of hazardous material releases at the construction sites would help to prevent a significant release of hazardous materials to the soil, groundwater, or nearby surface waters. If the amount of hazardous material were 660 gallons in a single tank or 1,320 gallons in multiple tanks, the City will prepare a SPCCP that would include preparation of a response to a release of hazardous materials from aboveground storage tanks and to prevent a release. Secondary containment and mitigation measures would also be identified. Implementation of Mitigation Measure HAZ-2 would reduce the impact to a less than significant.

Mitigation Measure HAZ-2: The City or its designated construction contractor shall prepare an HMMP for construction. The HMMP will address storage, containment, and transfers of hazardous materials related to project construction. This plan will also address equipment maintenance, monitoring, training of employees, and emergency response related to hazardous materials. The San Joaquin County Office of Emergency Services staff will review the HMMP, training documents, and general safety conditions during routine inspections.

Significance After Mitigation: Less than significant.

Impact HAZ-3: Operation of the WTP could expose individuals to existing and/or potential future use of hazardous materials and generation of hazardous wastes. Less than significant with mitigation for the WTP.

Water Treatment Plant

The proposed WTP would use potentially hazardous materials in the treatment of raw surface water. The hazardous materials described in Table 3.8-2 would be used to help remove suspended solids, control and adjust pH, and disinfect raw surface water all in an effort to consistently achieve mandated drinking water limitations (primary and secondary drinking water regulations) and provide customers with a quality drinking water product. In addition to the chemicals listed in Table 3.8-2, paint thinners, paints, waste oils, miscellaneous lubricating oils, laboratory solvents, compressed acetylene and oxygen gas, and diesel fuel would be stored in various small quantities throughout the WTP site. Stored in bulk, and not presented in Table 3.8-2, would be proprietary polymers: cationic polymer used as a coagulation aid, anionic polymer used as a flocculation aid, and nonionic polymer used as a filter aid.

Liquid sodium hypochlorite would be used for disinfection (chlorination) of the drinking water. Identical to common household bleach except with regards to concentration of the active ingredient (sodium hypochlorite), liquid sodium hypochlorite would be delivered to the site in tank trucks as a 12.5 percent (trade) solution. Liquid sodium hypochlorite is inherently safer and far less hazardous than compressed chlorine gas, commonly used in the drinking water treatment industry. Liquid sodium hypochlorite is moderately corrosive. However, liquid sodium hypochlorite in its natural liquid state poses a far less severe inhalation hazard as that associated with compressed chlorine gas. The use, storage, and toxicity of hazardous materials proposed for use at the WTP are presented in Table 3.8-2.

TABLE 3.8-2
POSSIBLE HAZARDOUS MATERIALS FOR USE AT 30 MGD WTP
Use, Storage, and Toxicity

Aluminum Sulfate (Alum) CAS No. 10043-01-3	Aluminum sulfate would be used as a coagulant in the treatment process. It would be stored as a liquid in two 10,000 gallon fiberglass tanks. Aluminum sulfate would be delivered as a liquid (49 percent solution) in bulk delivery with 30 days of onsite storage provided. Aluminum sulfate is a known skin irritant.
Carbon, Activated CAS No. 7440-44-0	Activated carbon would be used for control of organic compounds (pesticides, pharmaceuticals, and naturally occurring compounds) that would affect the taste and odor of the treated water. Conventional treatment would use granular activated carbon; membrane treatment would use powdered activated carbon. The activated carbon would be delivered in ten 4,000 pound supersacks with 30 days of onsite storage provided. Activated carbon affects respiratory and cardiovascular systems.
Sodium Hydroxide (Caustic Soda) CAS No. 7646-01-0	Sodium hydroxide would be used for pH control. It would be stored in two 5,000 gallon steel drums. Sodium hydroxide would be delivered as a liquid (25 percent solution) in bulk delivery with seven days of onsite storage provided. Sodium hydroxide is extremely corrosive.
Sodium Hypochlorite (Bleach) CAS No. 1310-73-2	Sodium hypochlorite would be used for filter pretreatment, disinfection, and maintaining a chlorine residual in the finished water. It would be stored in two 5,000 gallon fiberglass tanks. Sodium hypochlorite would be delivered as a liquid (12.5 percent solution) in tank trucks with 30 days of onsite storage provided. Sodium hypochlorite ingestion can cause severe gastrointestinal corrosion. Inhalation of sodium hypochlorite fumes can cause pulmonary edema.
Citric Acid CAS No. 5949-29-1	Citric acid would be used for membrane cleaning. It would be stored in a 270-gallon polyethylene tank. Citric acid would be delivered as a liquid with 60 days of onsite storage. There would be approximately six cleanings per year. Citric acid is an eye, skin, and respiratory irritant.
Sodium Bisulfite CAS No. 7631-90-5	Sodium bisulfite would be used for membrane cleaning. It would be stored in a 150-gallon polyethylene tank. Sodium bisulfite would be delivered as a liquid with 60 days of onsite storage. There would be approximately six cleanings per year. Sodium bisulfite is an eye, skin, and respiratory irritant.
Liquid Oxygen CAS No. 7782-44-7	Liquid oxygen would be stored in a steel tank at the WTP and would be used in the ozonation process. Approximately 10,000 gallons would be stored. Oxygen is a neutral gas that can support combustion. Because oxygen would be stored in a liquid state, it would be under great pressure.

SOURCE: Merck (2004).

Treatment and flocculation sludge would be generated in the water treatment process. Treatment plant sludge comprising material from sedimentation basins and filter backwash would be dried on-site before being taken to a landfill. Such sludge is primarily composed of mostly inert material containing the particles removed from the raw water (primarily silt and clay) aluminum hydroxide produced during coagulation; it is not a hazardous waste.

Specific storage containers, containment systems, and storage locations have not yet been specified. Compliance with state and federal regulations would prevent potential hazards, such as storage of incompatible chemicals with contiguous containment systems, use of bulk storage vessels or chemical delivery systems in areas where vehicles would contact them, use of hazardous materials in a manner they were not intended that would result in accidental upset and subsequent exposure of workers, visitors, or the environment to possibly occur.

Numerous federal and state programs address design and operational controls applicable to the storage and use of hazardous materials. Each operator of a system involving the use of hazardous materials is responsible for implementing programs to ensure compliance with applicable laws and regulations and to impose additional, more stringent precautions when necessary. Each operator is also responsible for ensuring that safe work practices are followed. The extent to which facility occupants are exposed to hazardous materials is related to the training they receive, how conscientiously they follow given safety procedures, and the extent that compliance with safety policies is supervised and enforced.

Compliance with state and federal laws and regulations and the implementation of effective health and safety programs are essential to ensure that the impact of increased hazardous substance use would be less than significant. Many of the environmental protection and health and safety programs established by industrial operators, as intended by many regulations, include self-audit mechanisms to ensure that program implementation and effectiveness (including compliance status) is documented with the appropriate governing agency.

Storage and use of hazardous materials at the WTP would pose a potentially significant impact that would be mitigated by the City complying with the applicable design and operation regulations and implementing the required safety programs and monitoring procedures.

Because of the use of hazardous materials on the WTP site, there would be an increase in the amount of hazardous materials transported on the existing local roadway network. Special tanker or flatbed trucks, operated by trained drivers, typically transport hazardous materials shipments. Deliveries to the WTP would travel along local surface streets. Delivery routes would be established in compliance with applicable City and County transport requirements (e.g., regarding vehicle weight and contents). Due to the bulk storage capacities at the proposed WTP, deliveries would occur on a schedule of approximately every 14 to 30 days. Exact delivery schedules would be determined on material consumption, and would likely increase during the summer season when demand for water is at its greatest.

Federal and state agencies determine driver training requirements, load labeling procedures, and container specifications for hazardous materials transport. Hazardous materials delivered in bulk by trucks would be transported to the WTP site by licensed transporters and would require special vehicles with cargo containers designed to withstand impacts as a result of a typical highway accident.

Caltrans consolidates general accident data for accidents occurring on state highways (Caltrans, 1996). Statewide, the accident rate is approximately 1.57 accidents per million vehicle miles traveled. The rate for rural San Joaquin County, in comparison to the statewide rate, is relatively low, and because vehicles carrying hazardous materials are often designed to withstand impacts, fewer accidents involving hazardous materials transporters would also involve a subsequent release of those materials. Therefore, accidents involving the release of hazardous materials in transport are considered quite infrequent and, therefore, the potential impact from accidents is considered less than significant.

Mitigation Measures HAZ-3a and HAZ-3b shall be implemented to reduce this impact to less than significant. The mitigation measures will include preparation of a HMMP, sufficient to describe emergency response, training, monitoring, and containment of hazardous materials used on the WTP site.

Mitigation Measure HAZ-3a: The design engineer shall design the WTP to comply with all pertinent sections of the UBC, Uniform Fire Code, and HMMP. Final project design shall include, but not be limited to, the following design features and measures:

- Incompatible chemicals will be physically separated;
- Fire suppression and control systems in chemical storage areas will utilize the appropriate fire retardant;
- All spill collection systems, containment, and aprons will be contained on site for truck pick up and not routed to any storm drain system;
- Outdoor storage vessels will be protected from accidental vehicle contact; and
- Bulk liquid hazardous materials delivery areas will include a delivery vehicle spill containment with collection sump.

Mitigation Measure HAZ-3b: The City shall consult with the appropriate authorities regarding its responsibilities concerning hazardous materials and their inventory, handling, and emergency response training. The City shall also consult with the CUPA regarding compliance with all relevant sections of the State Health and Safety Code. Upon consultation with these agencies, the project applicant shall prepare and implement all required/requested documentation.

Significance After Mitigation: Less than significant.

3.8.3 REFERENCES

California Department of Transportation. 1996. 1995 Accident Data on California State Highways. Transportation, and Housing Agency; Department of Transportation; Division of Traffic Operations. May 6, 1996.

Central Valley Regional Water Quality Control Board (CVRWQCB). 2004a. List of Spill and Leak Sites Cleanup Cases in the Central Portion of the Central Valley Region. Available at: http://www.swrcb.ca.gov/~rwqcb5/available_documents/index.html

Central Valley Regional Water Quality Control Board (CVRWQCB). 2004b. List of Leaking Underground Storage Tank Cases in the Central Valley Region. Available at: http://www.swrcb.ca.gov/~rwqcb5/available_documents/index.html

City of Stockton. 1990. City of Stockton General Plan: Policy Document. Adopted January 22, 1990; last amended November 3, 1998.

Hodgson, E., and P. Levi. 1987. Modern Toxicology. Appleton & Lang, Norwalk, Connecticut.

Merck & Co. 2004. The Merck Index. 13th ed. Merck & Co., Inc., Whitehouse Station, New Jersey.

State of California. 1998. Hazardous Waste and Substances Sites List, dated April 1998.

3.9 TRANSPORTATION AND TRAFFIC

This section discusses existing transportation and traffic facilities within the project area and surrounding vicinity, associated regulatory framework, and an analysis of potential impacts to these facilities that would result from implementation of the proposed DWSP.

3.9.1 SETTING

The proposed DWSP facilities would be located primarily along existing local roadways and the San Joaquin River (Stockton Deep Water Ship Channel).

REGIONAL TRANSPORTATION NETWORK

Regional access to the project area and local roadways would be provided by I-5, SR 99, and the San Joaquin River (Figure 2-2); these are described below.

Interstate 5 is a major north-south freeway and the primary regional roadway in the DWSP vicinity. I-5 is a six-lane divided freeway, with an overpass at Eight Mile Road. Its diamond interchange with Eight Mile Road is signalized at both the northbound and southbound ramps. Both the proposed raw and treated water pipelines would tunnel beneath I-5 just north of its intersection with Eight Mile Road.

Union Pacific Railroad operates a railroad line that crosses the eastern portion of the project area. Both the proposed raw and treated water pipelines would tunnel beneath the railroad tracks north of the rail line's intersection with Eight Mile Road, about 2,000 feet east of Davis Road.

Stockton Deep Water Ship Channel is used by fully loaded vessels in the 45,000 to 55,000 ton class and maximum 60,000 ton class (for certain wide-beam vessels). Up to 80,000 ton class vessels can transit the channel partially loaded. There is no width restriction of vessels, and ships up to 900 feet in length can navigate the channel. The total number of annual calls at the Port of Stockton is approximately 20. The proposed intake facility would be located near the ship channel, which may be used for potential deliveries of DWSP construction materials.

LOCAL TRANSPORTATION NETWORK

Local roadways that would be affected by the additional truck and equipment traffic and pipeline construction are described below and shown in Figure 2-2. There are no fixed-route public transit services on these roadways.

Empire Tract Road is a two-lane undivided roadway built on the water-break levee. The roadway follows the curvature of the Delta and has discontinuous gravel shoulders. Recreational fishing occurs along the full length of the roadway. Empire Tract Road terminates at its south end in an informal gravel parking area that is gated. The road's paved cross-section is approximately 18 feet wide. The roadway is posted at 30 mph, with a 5 mph posting near the fishing docks.

Empire Tract Road is stop controlled on its northbound and eastbound approach at its intersection with Eight Mile Road.

Levee Road is a 13-foot wide restricted-access gravel road at the southern end of Empire Tract Road. The road is used for levee maintenance. A gate restricts access.

Eight Mile Road is an arterial with varying width, consisting of a two-lane undivided road for the majority of its length within the project area.[1] Between Empire Tract Road and Mokelumne Circle about 0.7 mile west of I-5, the two-lane Eight Mile Road ranges between 20 and 26 feet in width, with discontinuous gravel shoulders. Eight Mile Road is posted at 30 and 45 mph along this stretch; with slower speed limits near the two draw bridges over Honker Cut and Bishop Cut.

Between Mokelumne Circle and Trinity Parkway (about 300 feet west of I-5), Eight Mile Road remains a two-lane arterial, but widens to approximately 49 feet. A detached sidewalk is adjacent to a housing development on the south side of Eight Mile Road. There is no on-street parking.

Near I-5 (on both sides of the underpass), Eight Mile Road is currently under construction. The roadway remains a two-lane roadway with no on-street parking. Near Oak Grove Regional Park, just east of the I-5 interchange, Eight Mile Road becomes a four-lane roadway, with two eastbound lanes, one center turn-lane, and one westbound lane. A sidewalk and on-street parking are present in the westbound direction. In this area, Eight Mile Road is approximately 60 feet wide and is posted at 55 mph.

Between Thornton Road and West Lane, Eight Mile Road returns to be a two-lane roadway, with a width of about 30 feet. Eight Mile Road is posted at 55 mph with discontinuous gravel shoulders.

Davis Road is a two-lane undivided arterial, with discontinuous on-street parking and a paved cross-section of approximately 60 feet. The roadway is posted at 55 mph, with a 25 mph posting in the school zone. Davis Road is a four-way stop at its intersection with Eight Mile Road.

West Lane is a four-lane divided arterial. West Lane has emergency on-street parking only and a paved cross-section of approximately 30 feet on each side of the median. The roadway is posted at 55 mph. West Lane is signalized at its intersection with Eight Mile Road.

Lower Sacramento Road is a two-lane undivided arterial. Lower Sacramento Road has discontinuous gravel shoulders and a paved cross-section of approximately 32 feet. The roadway is posted at 55 mph. Lower Sacramento Road is signalized at its intersection with Eight Mile Road.

[1] Eight Mile Road is envisioned as an eight-lane arterial between I-5 and SR-99 in existing planning documents. However, at present there is no foreseeable date for the widening to begin.

TRAFFIC VOLUMES

The operating conditions experienced by motorists are described as the “level of service” (LOS). The LOS is based on several factors, including:

- traffic volumes,
- intersection lane configurations,
- design and type of intersection control,
- speed and travel time,
- traffic interruptions,
- freedom to maneuver, and
- driving comfort and convenience.

The LOS may be expressed qualitatively with letters “A” through “F” to indicate from best to worst, which cover the entire range of traffic operations that might occur. LOS A through E generally represents traffic volumes at less than roadway capacity, while LOS F represents over-capacity or forced flow conditions. The City and County consider LOS A through D to be acceptable operating conditions for roadways. The City considers LOS E and F to be unacceptable.

Roadway segments were analyzed using the methodology found in the Transportation Research Board’s (TRB) 1985 Highway Capacity Manual. The evaluation criteria used for daily LOS assessment are shown in Table 3.9-1. Table 3.9-2 provides the volume-to-capacity (v/c) and qualitative descriptions of traffic conditions, which correspond to the various LOS.

Weekday traffic within the DWSP area consists primarily of commute traffic within the peak-traffic periods, and a mix of trips generated by residential, agricultural, commercial, and industrial uses throughout the day. Daily traffic on roadways is highest on West Lane and Lower Sacramento Road, followed by Eight Mile Road east of I-5. Existing daily traffic volumes on roadways potentially affected by the DWSP are presented in Table 3.9-3.

REGULATORY SETTING

Policies that have been interpreted as potentially applicable to short-term traffic impacts during construction of the DWSP facilities are described below.

San Joaquin County General Plan

Policies:

1.1 The County shall plan, develop, and coordinate transportation facilities on a regional basis.

1.8 Development shall provide transportation systems improvements necessary to serve the development.

2.3 Transportation needs and access shall be considered when locating land uses.

TABLE 3.9-1
LEVEL OF SERVICE CRITERIA

Level of Service	Roadway	Freeway
A	Free flow operations at average travel speeds usually about 90 percent of free flow speed for the arterials. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at traffic signals is minimal.	Free flow vehicle unaffected by other vehicles in the traffic stream.
B	Reasonably unimpeded operations at average travel speeds usually 70 percent of the free flow speed for arterials. The ability to maneuver within the traffic stream in only slightly restricted and stopped delays are not bothersome.	Higher speed range of stable flow. Volume 50 percent of capacity or less.
C	Stable operations. However, ability to maneuver and change lanes in mid-block locations may be more restricted than LOS B, and longer queues and/or adverse signal coordination may contribute to lower average travel speeds of about 50 percent of the average free flow speed.	Stable flow with volumes not exceeding 75 percent capacity.
D	Borders on a range on which small increases in flow may cause substantial increases in approach delay and, hence, decreases arterial speed. Average speeds are about 40 percent of free flow speeds.	Upper end of stable flow conditions. Volumes do not exceed 90 percent of capacity.
E	Significant approach delays and average travel speeds of one-third free flow speed or lower.	Unstable flow at roadway capacity. Operating speeds 30 to 25 mph or less.
F	Arterial flow at extremely low speeds below one-third to one-quarter of the free flow speed.	Stop-and-go traffic with operating speeds less than 30 mph.

Source: Transportation Research Board, 1985

TABLE 3.9-2
EVALUATION CRITERIA FOR ROADWAY LEVELS OF SERVICE (DAILY VOLUMES)

Facility Type	C	D	E
Urban Streets	V/C = 0.71-0.80	V/C = 0.81-0.90	V/C = 0.91-1.00

v/c = volume-to-capacity

Source: Transportation Research Board, 1985

TABLE 3.9-3
EXISTING DAILY TRAFFIC VOLUMES ON ROADWAYS IN THE PROJECT AREA

Roadway	Location	Daily Traffic (VPD) [a]	Count Date
San Joaquin County			
Davis Road	south of Eight Mile Road	5,070	5/13/93
Eight Mile Road	east of Interstate 5	8,490	7/10/96
	west of Interstate 5	2,670	7/10/96
	east of West Lane	9,020	6/15/95
	west of West Lane	13,160	6/15/95
	west of Davis Road	8,710	6/09/95
	west of Thornton Road	7,020	6/09/95
	at Union Pacific rail tracks	9,390	6/09/95
Empire Tract Road	south of Eight Mile Road	175	11/01/80
Lower Sacramento Road	north of Eight Mile Road	11,490	6/09/95
West Lane	south of Eight Mile Road	13,230	6/05/95

[a] VPD = vehicles per day.

SOURCE: San Joaquin County Traffic Engineering Division, 2004

3.1 The County shall plan for a road system of adequate capacity and design to provide reasonable and safe access by vehicles with minimum delay.

3.7 Development shall provide all right-of-way and on-site road improvements necessary to serve the development and mitigate off-site traffic impacts triggered by the development.

3.8 On Minor Arterials and roadways of higher classification, the County shall maintain a LOS no lower than D at all intersections and following on the throughway: (a) on State highways, LOS D, (b) within a city's sphere of influence, LOS D, or LOS C when the city plans for that level of service or better, (c) on other roads, LOS C.

City of Stockton General Plan

Goals:

III.1.A Develop a street and highway system which promotes the safe, efficient, and reliable movement of people and goods.

Policies:

4. Priority shall be given to street and highway improvements that increase safety, minimize maintenance costs, and increase the efficiency of the street system.

7. Maintain existing arterial streets and develop new arterial streets to function as routes for efficient intra-city travel (i.e., street paralleling State highways).

9. For traffic operating conditions use "Level-of-Service" (LOS) of "D" or better on a p.m. peak hour basis as the planning objective for the evaluation of new development, mitigation measures, impact fees and public works capital improvement programs.

3.9.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

According to the CEQA Guidelines, a project would normally result in an impact to transportation and traffic if it would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system. Occasional post-construction maintenance activities would briefly affect only local segments. Therefore, these impacts would be less than significant.

The duration of potentially significant impacts, related to short-term disruption of traffic flow and increased congestion generated by construction vehicles and/or loss of a travel lane to accommodate the construction work zone would be limited to the period of time needed to complete construction of the project components. Therefore, mitigation measures identified below focus on reducing the short-term project construction effects; long-term mitigation measures would not be needed.

For the proposed DWSP, an impact would be considered potentially significant for the following conditions:

- Cause an increase in traffic that is substantial in relating to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).
- Exceed, either individually or cumulatively, a LOS standard established by the County congestion management agency for designated roads or highways.
- Result in a change in traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to design feature or incompatible uses.
- Result in inadequate emergency access.
- Result in inadequate parking capacity.
- Conflict with adopted policies, plans, or programs supporting alternative transportation.

METHODOLOGY

This analysis relies upon available information and a field reconnaissance of the DWSP area. The reconnaissance identified roadway characteristics (e.g., pavement widths and existence of on-street parking).

Assessment of impacts related to construction of DWSP facilities involved evaluating the effects of those activities on traffic and circulation resulting from increases in traffic volumes, loss of travel lanes and/or parking areas, and potential safety effects associated with construction. Construction characteristics, including proposed manpower and equipment, location of construction, and rate of construction were used to conservatively determine the potential number of vehicles that could be required for facilities installation.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.9-4 provides a summary of the significant and less than significant transportation and traffic impacts associated with DWSP facilities.

IMPACT STATEMENTS AND MITIGATION MEASURES

Impact TR-1: Construction of the raw and treated water pipelines could temporarily reduce the number of, or the available width of, travel lanes on roads, resulting in an unacceptable LOS or v/c ratio. Less than significant impact with mitigation for the raw and treated water pipelines.

Construction of the proposed raw and treated water pipelines would involve either open-cut trenching (the predominant method) or trenchless construction techniques. The proposed pipeline would be 54 inches in diameter, requiring a trench width of seven to eight feet. The width of the construction work zone along the open trench would be wider than the trench width to facilitate access by trucks and loaders; for purposes of this analysis, the work zone would be up to 80 feet wide. The minimum practicable construction corridor width would be 47 feet in constrained areas. In recognition of constrained roadway widths along some segments of the proposed pipeline alignments, the construction work zone would need to provide a minimally acceptable 10-foot pavement width to maintain alternate one-way traffic flow past the construction zone. If it is not possible to provide the minimum 10-foot travel width, then the roadway would have to be closed to all except emergency vehicles during construction work hours. Pipeline installation would occur at a rate of 350 feet per day in low-volume sections of roadways. In more developed areas, the installation rate is expected to average approximately 200 feet per day. At this time, it is anticipated that at least two crews would be working on the pipeline installation on a typical workday.

TABLE 3.9-4
SUMMARY OF IMPACTS – TRANSPORTATION AND TRAFFIC FACILITIES

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
TR-1: Construction of the raw and treated water pipelines could temporarily reduce the number of, or the available width of, travel lanes on roads, resulting in an unacceptable LOS or v/c ratio.	NI	NI	LSM	NI	LSM
TR-2: Construction would generate short-term increases in vehicle trips by construction workers and construction vehicles that could cause a substantial decrease in the LOS.	LSM	LSM	LSM	LSM	LSM
TR-3: Construction of the raw and treated water pipelines could adversely affect access to adjacent land uses and streets for both commercial and emergency traffic, and bicycle/pedestrian access.	NI	NI	LSM	NI	LSM
TR-4: Construction of the raw and treated water pipelines could generate a demand for construction worker parking, and could temporarily displace existing on-street parking on pipeline routes.	NI	NI	LSM	NI	LSM
TR-5: Construction of the raw and treated water pipelines could increase potential traffic safety hazards for vehicles, bicyclists and pedestrians on affected public roadways.	NI	NI	LSM	NI	LSM
TR-6: Construction could increase wear-and-tear on the designated haul routes used by construction vehicles to access the project work site.	LSM	LSM	LSM	LSM	LSM
TR-7: Operation of the proposed WTP could increase vehicle trips on area roadways.	NI	NI	NI	LS	NI

LSM = Less than Significant Impact with Mitigation
LS = Less than Significant Impact
NI = No Impact

Raw Water Pipelines

The raw water pipelines would be constructed underground beneath existing regional transportation facilities including I-5 and the Union Pacific Railroad tracks. Therefore, the construction of the raw water pipelines would have no impact on these transportation facilities.

Construction of the raw water pipelines would typically require an 80-foot construction corridor within the ultimate 90-foot wide pipeline easement. This easement would include a 15-foot wide excavation area; a 12- to 25-foot wide passage way for excavators, equipment, and haul trucks; and 10- to 15-foot wide materials laydown or soil storage area. The actual width of the construction zone would vary according to site-specific conditions, restrictions, and need.

The construction of the raw water pipelines would not affect Empire Tract Road. The pipelines would be installed 250 feet east of the roadway.

Installation of the pipelines along Eight Mile Road between Bishop Cut and I-5 has the potential to temporarily interfere with existing traffic movement, temporarily reduce roadway and intersection capacity to result in congested conditions, and cause an unacceptable LOS. The pipelines would be installed on the north side of Eight Mile Road and traffic flow would be maintained, although it may be restricted to a one-way, flagger-control in some sections. Mitigation would minimize the impact of pipeline construction along Eight Mile Road and Lower Sacramento Road to less than significant.

Treated Water Pipelines

Treated water pipelines would be installed along Davis Road, Lower Sacramento Road, West Lane, and segments of Eight Mile Road. While the easement for the pipelines would be 80 feet wide to allow sufficient space to maintain the pipelines; the minimum practicable construction corridor would be 47 feet. For purposes of this analysis, the width of the construction work zone along the open trench on the paved roadway was estimated to be 25-feet wide.

On Davis Road, the pavement width would accommodate a 25-foot-wide construction work zone, and would allow two-way traffic flow within the remaining width (with restriping and/or traffic cones to channelize vehicles through the zone). On West Lane, it is assumed that the pipeline would be installed on one side of the center median, with two-way traffic flow maintained during work hours on the opposite side of the median (with restriping and/or traffic cones to channelize vehicles through the zone).

Along Lower Sacramento Road, the pipeline would be placed under the west (southbound) lane of traffic. The work zone would lie within the paved cross-section, and would leave less than the 10-foot pavement width required to maintain alternate one-way traffic flow (with flaggers to control flow) through the zone. Therefore, without additional pavement width within the right-of-way, one lane of Lower Sacramento Road would need to be closed to traffic during work hours.

Refer to the discussion above regarding impacts of pipeline installation on Eight Mile Road. The following mitigation measures would reduce the effect of these impacts to less than significant.

Mitigation Measure TR-1a: The City shall prepare and implement a Traffic Control Plan for all project-affected roadways and intersections. The Traffic Control Plan will comply with requirements in encroachment permits issued by the County. The Traffic Control Plan will include, but not be limited to, the following measures:

- Limit the construction work zone to a width that, when feasible, maintains one-way traffic flow past the construction zone. Where this is not feasible, construct temporary widening within the construction right-of-way to maintain alternate one-way traffic flow, or use detour signing on alternate access streets when temporary full street closure is required.
- Restrict construction to non-peak traffic periods as required for work sites on roadways and intersections operating at less than LOS D.
- During non-construction periods provide traffic controls and safety signage at all construction sites to manage traffic control and flows.
- Coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to commercial areas (e.g., Christmas holiday shopping period) and schools.
- Post advisories of construction activities (e.g., signs, articles in newspapers, the City's website, notices on radio/TV, etc.) to allow motorists to select alternative routes in advance.

Mitigation Measure TR-1b: In consultation with the County, the City shall identify areas where night construction may be appropriate. Candidate locations would be in non-residential zones operating at less than LOS D and where there are no sensitive noise receptors.

Mitigation Measure TR-1c: The City shall arrange for a 24-hour telephone hotline and/or website to address public questions and complaints during project construction, and to offer information about detours, carpooling opportunities, and traffic delays and congestion.

Significance After Mitigation: Less than significant.

Impact TR-2: Construction of the proposed DWSP facilities would generate short-term increases in vehicle trips by construction workers and construction vehicles that could cause a substantial decrease in the LOS to less than LOS D, i.e., approaching unstable operations where small increases in volume produce substantial increases in delay and decreases in speed. Less than significant with mitigation for all DWSP facilities.

The buildout of the DWSP would include installation of parallel pipelines in future years to increase capacity. Each of these actions would generate short-term increases in vehicle trips by construction workers and construction vehicles on area roadways.

Intake Facility

The majority of project traffic related to construction of the intake facility would occur during earthwork/grading, foundation, and structural construction. Less construction traffic would be generated by equipment installation, utilities works, and operation set up. The typical crew size would be 14 people, plus inspectors. Construction worker trips traveling to and from each work site are not anticipated to exceed 22 round trips (44 one-way trips) per day. The construction would occur in periodic activity peaks, requiring brief periods of considerable effort followed by longer periods of reduced activities. Average daily truck trips, over the duration of the project construction, are expected to be about 55 truck round trips (110 one-way trips).

Project-related hauling and deliveries would be dispersed throughout the day, thus lessening the effect on peak-hour traffic. Construction-related truck traffic occurring on weekdays during the hours of 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. would coincide with peak-period traffic on access roadways, and therefore, would have the greatest potential to impede traffic flow. Project-generated trips, dispersed over various access roads, would not be substantial relative to background traffic conditions on the area’s arterials and freeways, and would fall within the daily fluctuations of traffic volumes (i.e., would not significantly affect traffic flow conditions) for those roadways. The impact of traffic generated by construction activities would mostly occur on the minor roadways serving the construction sites, such as Empire Tract Road, where the construction of the intake facility and installation of the raw water pipelines would substantially increase the current traffic volumes.

Raw and Treated Water Pipelines

Traffic-generating construction activities related to pipeline installation would consist of the daily arrival and departure of construction workers to each work site; trucks hauling equipment and materials to each work site; and the hauling of excavated spoils from, and import of new fill to, each work site. Construction-generated traffic would be temporary, and therefore, would not result in any long-term degradation in operating conditions or LOS on any project area roadways. The primary off-site impacts from the movement of construction trucks would include short-term and intermittent lessening of roadway capacities due to slower movements and larger turning radii of the trucks as compared to passenger vehicles.

Raw Water Pipelines

The typical crew size would be approximately 14 crew members, plus inspectors. Construction worker trips to and from each work site are not anticipated to exceed 22 round trips (44 one-way trips) per day. Using an expected trench size (up to 10 feet) and construction rate (about 200 feet per day), it is estimated that up to 400 cubic yards (CY) of trench spoils would be hauled off-site daily, and a similar volume of new fill would be imported daily. Using an average haul load of 15 CY per truck, this would amount to up to about 55 truck haul round trips (110 one-way trips) generated per work day for the pipeline installation. There also would be miscellaneous deliveries of construction materials, fuel, and other items, which would be shipped on demand to the construction site throughout the construction period. It is expected that these deliveries would generate an average 5 round-trips (10 one-way trips) per day.

Treated Water Pipelines

The typical crew size would be approximately 14 crew members, plus inspectors. Construction worker trips traveling to and from each work site are not anticipated to exceed 22 round trips (44 one-way trips) per day. Using the expected trench size (up to 5 feet) and construction rate (about 200 feet per day), and assuming no backfilling of soil, it is estimated that up to 150 CY of trench spoils would be hauled off-site daily, and a similar volume of new fill would be imported daily. Using an average haul load of 15 CY per truck, this would amount to up to about 20 truck haul round trips (40 one-way trips) generated per work day for the pipeline installation. There also would be miscellaneous deliveries of construction materials, fuel, and other items, which would be shipped on demand to the construction site throughout the construction period.

Water Treatment Plant

The majority of project traffic related to construction of the WTP would occur during earthwork/grading, foundation, and structural construction. Less construction traffic would be generated by equipment installation, utilities works, and operation set up. The typical crew size would be 11 to 15 people, plus inspectors. Construction worker trips traveling to and from each work site are not anticipated to exceed 22 round trips (44 one-way trips) per day. The construction would occur in periodic activity peaks, requiring brief periods of considerable effort followed by longer periods of reduced activities. Average daily truck trips, over the duration of the project construction, is expected to be about 18 truck round trips (36 one-way trips).

Mitigation Measure TR-2a: As part of the Traffic Control Plan (see Mitigation Measure TR-1a), the City and the construction contractor shall specify designated haul routes for the project after consultation with agencies with local roadway jurisdiction.

Mitigation Measure TR-2b: Where feasible, the City shall schedule the multiple daily work sites such that their relative locations shall disperse truck trips over a number of different haul routes, thereby lessening the number of truck trips on any one road at one time.

Significance After Mitigation: Less than significant.

Impact TR-3: Construction of the proposed raw and treated water pipelines could adversely affect access to adjacent land uses and streets for both commercial and emergency traffic, and bicycle/pedestrian access. Less than significant with mitigation for the raw and treated water pipelines.

As discussed in Impact TR-1, the proposed DWSP would have temporary effects on traffic flow, particularly with pipeline installations proposed within road segments. Pipeline construction within or across streets, and temporary reduction in travel lanes, would result in delays for emergency vehicle access in the vicinity of the work sites. In addition, access to driveways and to cross-streets along the construction route may be temporarily blocked due to trenching and paving. This would 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 work day through the use of steel trench plates or trench backfilling. Based on the estimated work pace, construction would occur for a maximum of about three to five days in front of an individual property on affected roads.[2] Access would still be provided to the affected properties; only access to parking (on- or off-street) adjacent to the property would be affected, and truck deliveries would be difficult. The duration of this short-term inconvenience would be less than significant with sufficient advance notification of the timing of construction in front of each affected property.

Some of the proposed pipeline alignments would result in temporary full street closures if the required width of the construction zone were to reduce the usable width of the street so as to prevent maintenance of, at minimum, alternate one-way traffic flow (i.e., on 10 feet of pavement width). Potential locations that would be subject to temporary closure would be Lower Sacramento Road and Empire Tract Road.

Mitigation Measure TR-3a: As part of the Traffic Control Plan for roadway segments and intersections (refer to Mitigation Measure TR-1a), the City shall develop a plan for maintaining emergency access and schools in consultation with local jurisdictions. The plans will include, but not be limited to, providing access through the construction zone, parking of fire trucks outside the firehouse on the side of the street opposite the construction during affected work hours, and identification of alternate routing around construction zones. Also, police, fire, and other emergency service providers will be notified of the timing, location, and duration of construction activities throughout the project, and the location of detours and lane closures.

Mitigation Measure TR-3b: The City shall use detour signing on alternate access streets established when temporary full street closure is required.

Mitigation Measure TR-3c: The City shall provide 72-hour advance notice of access restrictions for residents and businesses.

Significance After Mitigation: Less than significant.

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[2] Applying the estimated pace of completed work (100 feet per day) and the overall active work zone on any given workday (about 300 to 600 feet) to examples of the duration of short-term impacts that people in the project area would experience, the length of time that active construction work is immediately in front of a property (assuming, for example, a 100-foot lot line) would likely be about three to five days.

Impact TR-4: Construction of the proposed raw and treated water pipelines could generate a temporary demand for construction worker parking, and construction activity could temporarily displace existing on-street parking on pipeline alignment routes. Less than significant with mitigation for the raw and treated water pipelines.

Although on-street parking is permitted on many of the roadways proposed for the pipeline alignments, there is not a large parking demand. The roadway that would be most affected if on-street parking were restricted would be Empire Tract Road due to the higher number of vehicles parked to access recreational fishing.

The project would create temporary parking demand for construction workers and construction vehicles. Assuming each worker drives alone to each day's work location, each crew installing pipeline would require about 12 parking spaces, and construction of the WTP and intake facility would generate a demand for about 15 parking spaces. Pipeline installation within roads also would temporarily displace existing on-street parking on affected streets. Segments of Eight Mile Road and other roadways on the proposed pipeline alignments do not have on-street parking spaces, and construction workers would have to park outside the immediate area of those streets. Given the proposed rate of construction during pipeline installation, impacts to on-street parking would be relatively brief at any one location throughout the project area. Given the work area at the WTP site, it is expected that workers would park on portions of the WTP site as construction proceeds. Because of the above-cited parking constraints at the proposed intake facility site and along the portions of the proposed pipeline alignment along Empire Tract Road, parking by construction workers would adversely affected parking conditions on Empire Tract Road.

Mitigation Measure TR-4: The City shall require the contractor(s) to provide off-street parking for construction worker's vehicles in the vicinity of the work zone, and if sufficient parking cannot be locally provided, workers will be van-pooled to the work site from an off-site parking location.

Significance After Mitigation: Less than significant.

Impact TR-5: Construction of the proposed raw and treated water pipelines could increase potential traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways. Less than significant with mitigation for the raw and treated water pipelines.

Heavy equipment operating adjacent to or within a road right-of-way would increase the risk of accidents. Construction-generated trucks on project area roadways would interact with other vehicles. Creation of construction work zones on high-volume and/or high-speed roadways (e.g., portions of Eight Mile Road and West Lane) heighten concerns about increased traffic safety hazards, because of the need to safely transition traffic into the travel lane(s) adjacent to the work zone. In addition, lane blockages or roadway closures during pipeline installation would result in temporary alteration in bicycle and pedestrian circulation. Potential conflicts also would occur between construction traffic and bicyclists and/or pedestrians. These potential impacts would be reduced to less than significant for all pipeline segments with the mitigation measures presented below.

Mitigation Measure TR-5a: As part of the Traffic Control Plan for roadway segments and intersections (refer to Mitigation Measure TR-1a), the City shall ensure that the plan includes installation of advance warning signs and speed controls to achieve required speed reductions for safe traffic flow through the work zone.

Mitigation Measure TR-5b: The City shall incorporate into contract specifications for all DWSP facilities, the requirement that traffic control plans (see Mitigation Measure TR-1a) include detours for bicyclists and pedestrians in all areas potentially affected by DWSP construction.

Significance After Mitigation: Less than significant.

Impact TR-6: Construction of the proposed DWSP facilities could increase wear-and-tear on the designated haul routes used by construction vehicles to access the project work sites. Less than significant with mitigation for all DWSP facilities.

The use of trucks to transport equipment and material to and from the project work sites would affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur would depend on the design (pavement type and thickness) and existing condition of the road. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. Therefore, impacts are expected to be negligible on those roads. However, rural roadways and residential streets may not have been constructed to support the weight and use by construction equipment.

Mitigation Measure TR-6: Roads damaged by construction activities will be repaired to a structural condition equal to that which existed prior to construction activity.

Significance After Mitigation: Less than Significant.

Impact TR-7: Operation of the proposed WTP could increase vehicle trips on area roadways. Less than significant for the WTP.

The WTP will operate 24 hours per day, every day of the year. Total full-time employment will be 11 employees, with a day shift of eight employees and a night or weekend shift of four employees. The employees traveling to and from the WTP would not exceed 60 round trips

(120 one-way trips) per day. In addition, there would be deliveries of materials (e.g., chemicals), scheduled and emergency maintenance, and waste disposal service trips generated by the facility. Project trips on access roadways are expected to be negligible. Therefore, the impact would be less than significant.

Mitigation: No mitigation is required.

3.9.3 REFERENCES

City of Stockton. 1990. City of Stockton General Plan: Policy Document. Adopted January 22, 1990; last amended November 3, 1998.

San Joaquin County. 1992. San Joaquin County General Plan 2010. Adopted July 29, 1992.

San Joaquin County. 2004. Average Daily Traffic – Single Day Counts. Traffic Engineering Division, San Joaquin County. June 24, 2004.

Transportation Research Board (TRB). 1985. Highway Capacity Manual. Special Report No. 209. Washington D.C.

3.10 PUBLIC SERVICES AND UTILITIES / ENERGY

This section addresses potential impacts to public services and utilities from the construction and long-term operation of the DWSP. This section also addresses potential impacts to energy resources due to potential substantial use of energy resources for project construction and operation.

3.10.1 SETTING

The DWSP would be constructed in unincorporated areas of San Joaquin County (County), except for the treated water pipelines located south of Eight Mile Road, which would be located in the City.

Police

The San Joaquin County Sheriff's Department provides law enforcement services within the unincorporated parts of the County (San Joaquin County, 1992). The Stockton Police Department provides protection services to the City (City of Stockton, 2004a). The California Highway Patrol enforces traffic regulations outside the City (San Joaquin County, 1992).

Fire Protection

The Stockton Fire Department serves the City and the surrounding unincorporated County area that includes the project area. The department operates from 12 locations throughout the City and utilizes approximately 7,000 hydrants in key locations to provide adequate water for the surrounding development. Fire Station Number 14 is located in the project area. The station has one engine and one grass rig (City of Stockton, 2004b).

Medical Services

Three major hospitals serve the City: San Joaquin General Hospital, St. Joseph's Medical Center, and Dameron Hospital (City of Stockton, 2004c). San Joaquin General Hospital is located in the unincorporated community of French Camp in San Joaquin County. Dameron Hospital is located south of the project area at approximately one mile north of SR 4 between I-5 and SR 99. St. Joseph's Medical Center is located approximately five miles north of the project area (immediately north of SR-12 between I-5 and SR-99).

Schools

The City is served by seven unified school districts: Escalon, Lincoln, Linden, Lodi, Manteca, Stockton, and Tracy. The Stockton Unified School District serves the largest portion of the general planning area, followed by the Lodi School District (City of Stockton, 2004b). Elkhorn Elementary School of the Lodi Unified School District, located on North Davis Road just south of Eight Mile Road in Stockton, is closest to the project area (City of Stockton, 2004b).

Library Facilities

Most library facilities in San Joaquin County are provided by the Stockton-San Joaquin County Public Library System. The Chavez Central Library in Stockton supports collections for nine branches, a bookmobile, and other various services. Branch libraries are located in Thornton, Linden, Tracy, Manteca, Ripon, Escalon, and throughout the City.

Communication

SBC Communications Inc. provides telephone service to the City and County. Telephone lines are placed in easement right-of-ways and are subject to the regulations governing those areas. Cellular telephone service is available through seven major service providers including AT&T Wireless, Cingular, Metro PCS, Sprint, T-Mobile, Verizon, and Virgin (City of Stockton, 2004b).

Comcast provides cable television. Direct TV and Dish Network satellite television systems are available through many private installation companies.

Basic internet service is available through direct telephone lines. High speed digital subscriber line (DSL) and cable internet are available depending on location and service provider.

Solid and Hazardous Wastes

The County Department of Public Works is responsible for administration of solid wastes and operation of facilities. The Environmental Health Division is involved in administering local and state regulations regarding waste management and has been appointed as the local enforcement agency throughout the County. Waste is collected by the cities or the County, or by private firms franchised and licensed by the cities or the County. The cities and the County are individually responsible for their own solid waste facilities, including transfer stations, disposal sites, and resource recovery facilities. San Joaquin County maintains three active landfills (San Joaquin County, 1992).

The City's solid waste is transported and disposed in the privately-owned Forward Landfill in Stockton, and the County-owned Foothill Landfill and North County Sanitary Landfill in Lodi. The City has signed a 15-year agreement with the landfill effective January 2004 for disposal of solid wastes. Upon its expiration, the agreement can be extended for an additional five years (City of Stockton, 2004b). Prior to transport to the landfills, the City's solid waste is transported to transfer stations. All residential waste is transported to either the East Stockton Transfer Station or the Lovelace Material Recovery Facility. At the transfer stations, recyclable materials are separated and then transported to a recyclable materials processing plant. The remaining residual waste is transported to the Forward Landfill (City of Stockton, 2004b).

Commercial and industrial solid waste is transported to the Forward Landfill via the East Stockton Transfer Station. To a lesser extent, commercial and industrial waste is also transported to the North County Landfill. However, the North County Landfill is primarily used by the City of Lodi (City of Stockton, 2004b).

Three franchises provide solid waste collection services for the City. Two of the franchises operate both commercial and residential services and one franchise operates solely as a commercial service. Sunrise Sanitation and Stockton Scavengers are the two waste management companies that operate in the City (City of Stockton, 2004b).

Wastewater

Wastewater treatment services are provided in the incorporated cities. Septic systems are used in many of the unincorporated communities and areas. The unincorporated areas are served by a combination of City sewers, county service districts, and private septic tanks (San Joaquin County, 1992).

The City operates a wastewater collection system through a system of pumping stations and sewer lines (San Joaquin County, 1992). The Stockton RWCF provides secondary and tertiary treatment of municipal wastewater throughout the City. The RCWF has a current dry weather flow capacity of 42 mgd. Current dry weather flows at the facility are estimated to be on the order of 35 mgd, or approximately 80 percent of the current dry weather capacity. The RWCF is located north of SR 4 on both sides of the San Joaquin River. The primary and secondary treatment facilities are located east of the river, while the secondary polishing facilities (630 acres of oxidation ponds plus dissolved air flotation facilities), filtration facilities, and disinfection facilities are located on the west side of the river. Primary and secondary solids are treated by anaerobic digestion, dewatered, and disposed off-site. Effluent is discharged into the San Joaquin River adjacent to the RWCF (City of Stockton, 2004b).

Water

Water agencies acquire water from ground and surface supplies, treat the water, and distribute the treated water to the users (San Joaquin County, 1992). The water agencies include the cities, public districts empowered to provide water, and quasi-public agencies such as Cal Water (San Joaquin County, 1992). Retail water purveyors in the COSMA include the Stockton MUD, Cal Water, and San Joaquin County (through the Lincoln Village and Colonial Heights Maintenance Districts (Figure 2-1).

The COSMA is divided into four separate water storage and distribution systems: North Stockton, Central Stockton, Walnut Plant Area, and South Stockton. The North Stockton water system, operated by the Stockton MUD and the San Joaquin County Maintenance Districts, currently produces approximately 5.7 mgd from groundwater wells and receives 16 mgd from the Stockton East Water District (SEWD) WTP. Twenty-two groundwater wells are in service with pump design flows ranging from 550 to 2,800 gallons per minute (gpm). Additionally, there are two 3 million gallon storage tanks near 14 Mile Slough and two 3.43 million gallon storage tanks near the Northwest Reservoir. These tanks deliver water through 18-, 24-, and 30-inch diameter mains. Additionally, a 48-inch diameter pipeline connects the system to the SEWD WTP.

The Walnut Plant Area, operated by the Stockton MUD, has three groundwater wells with production capacities ranging from 780 to 2,500 gpm. The system is connected to the Cal Water system and receives surface water. One 55,000 gallon tank delivers water through 12-inch diameter mains.

The Central Stockton water system, operated by Cal Water, pumps approximately 11.3 mgd from groundwater wells and receives 19.2 mgd from the SEWD WTP. There are approximately 58 groundwater wells, each with a production capacity of about 1,500 gpm. Additionally, there are 12 storage tanks ranging in size from 0.74 to 3.8 million gallons. The system is connected to the SEWD WTP via a 42-inch diameter transmission main.

The South Stockton water system, operated by the Stockton MUD, pumps approximately four mgd from groundwater wells and does not receive any surface water from the SEWD WTP. There are six groundwater wells with pump design flows ranging from 900 to 2,500 gpm. There is one three million gallon tank located near the Weston Ranch Subdivision.

According to the City of Stockton General Plan Background Report (City of Stockton, 2004b), segments of the treated water pipelines that would be located within the City limits would occur in the north Stockton service area. Stockton MUD and the San Joaquin County Maintenance Districts (SJCMDs) serve the north Stockton service areas (City of Stockton, 2004b).

Storm Drainage

Drainage facilities are operated by the incorporated cities, urban communities, and irrigation districts, including the City. Urban portions of the City are served by a system of underground storm drains that are separate from the sanitary sewer system (San Joaquin County, 1992). Storm water flows to catch basins or to outfall points along the City's natural drainage ways. At several locations storm drain catch basins feed into the sanitary collection system. The storm drainage system is generally connected to flood control canals and channels that drain into sloughs of the San Joaquin River and the Delta. Some incorporated portions are served by roadside drainage ditches (San Joaquin County, 1992).

Storm water management in the City is regulated by certain federal, state, and local regulations, standards, and criteria related to the computation of runoff, facility design, and quality of runoff entering streams (City of Stockton, 2004b).

Gas and Electric Service

San Joaquin County is primarily served by PG&E for natural gas and electric service. All of the energy used in San Joaquin County, except energy derived from wind and co-generation facilities, is imported from outside the County (San Joaquin County, 1992). PG&E provides electricity in the COSMA (City of Stockton, 2004b) from the inter-grid system, which serves the entire state.

Electrical transmission lines are located east of Empire Tract Road. The electrical service for the intake pump station would be brought from the existing substation located at Eight Mile Road and I-5. New cables would be located overhead on new or possibly existing power poles.

High voltage electrical transmission lines are located just west and parallel to I-5 including a substation at the intersection of Eight Mile Road and I-5. The transmission lines follow Eight Mile Road along segments through I-5 and toward Lower Sacramento Road.

Electrical service requirements at the WTP would be greater than at the intake pumping station, so developing primary service voltage for the WTP would provide an opportunity to coordinate service to the intake pumping station. The electrical service for the intake pump station would be brought to a new substation near the intake site, served from the existing substation located at Eight Mile Road and I-5. New cables would be located overhead on new or possibly existing power poles.

Energy Resources

The proposed WTP is within the electric and natural gas service of PG&E. PG&E has existing 12 kV power lines and a substation close to the WTP site.

REGULATORY SETTING

This section discusses the policies and objectives in the San Joaquin County and City of Stockton General Plans that govern public services and facilities.

SAN JOAQUIN COUNTY GENERAL PLAN

The San Joaquin County General Plan (1992) lists the following objectives and policies for different infrastructure services.

Wastewater Treatment

Objective 1. To ensure adequate wastewater treatment and the safe disposal of liquid waste.

> Policies provide for requirements for wastewater treatment facilities, expansion of urban communities to be limited to areas where community wastewater treatment systems can be provided, permitting of septic systems, and restricted areas for construction of sewage treatment facilities.

Water Supply

Objective 1. To maintain an adequate and safe water supply for County users.

> This includes policies for availability of long-term and reliable potable water supply in the planning areas of growth and minimum requirements for water supply.

Storm Water Drainage

Objective 1. To collect and dispose of storm water in a manner that least inconveniences the public, reduces potential water-related drainage, and enhances the environment.

This includes policies for minimum requirements for storm water drainage facilities.

Solid Waste Disposal

Objective 1. To ensure the safe and efficient disposal or recycling of wastes generated in San Joaquin County.

This includes policies for mandatory requirement of waste collection in all urban and rural communities of San Joaquin County, promotion of maximum use of solid waste reduction, recycling, and composting, requirements for new sanitary landfills and consistency with the County's Waste Management Plan.

Utility Corridors

Objective 1. To protect the public and the natural environment from possible hazards associated with utility corridors.

Objective 2. To protect the scenic value of the County landscape from inappropriately located overhead utility lines.

Objective 3. To protect land uses from the placement of utility corridors across property at inappropriate locations.

These include policies for environmental assessment of new or expanded utility lines, and use of existing transmission corridors for new lines.

City of Stockton General Plan

The City of Stockton General Plan (1990) governs the placement and subsequent extension of the public infrastructure within the project area. The following goals and polices are provided in the Land Use and Public Facilities Elements as they relate to public facilities and services.

Public Facilities and Services

Goal 1: Provide public facilities and City services throughout the urbanized area.

Policies:

1. Give priority to providing services to existing urban areas and to prevent the deterioration of existing levels of service.

4. Promote the consolidation of overlapping special service districts in order to increase efficiency and the quality of service and delivery.

5. Development proposals shall be reviewed for their impacts on various infrastructure components (i.e., sewer, water, fire stations, libraries, streets) and should be required to provide appropriate mitigation measures if development reduces service levels.

6. Require recycling programs, which reduce demand for solid waste disposal capacity.

11. PG&E, Pacific Bell, and Continental Cablevision should upgrade their facilities and acquire appropriate easements to accommodate development.

Goal 3: Assure that public facilities are compatible with surrounding land use and are an asset to the area.

Policy

3. Governmental and semi-public agencies shall provide facilities that are attractive and complementary with their environment.

Fire Safety

Goal 1: Incorporate fire safety precautions in existing urbanized areas and in planning for new development.

Policies:

1. Protection from fire hazards shall be a consideration in all planning, regulatory, and capital improvement programs.
2. Fire prevention programs shall be continued to reduce fire hazards and to increase public awareness.
3. Locate and maintain fire stations according to fire service area standards and maintain the water supply system necessary to provide the required water flow for fire fighting purposes.
4. New development shall provide adequate access for emergency vehicles, particularly fire fighting equipment, as well as proved evacuation routes.
5. Regulate the storage of flammable and explosive materials and strongly encourage the proper transportation of such materials.

Police Protection

Goal 1: Provide protection to the public through effective law enforcement and the incorporation of crime prevention features into new development.

Policies:

1. Seek to promote the inclusion of security features into all structures.
2. Defensible space design techniques shall be considered in the review of new development in order to enhance crime prevention.

Safety Element

Emergency and Disaster Planning

Goal 1: Develop and maintain emergency preparedness programs and emergency health services in order to protect the public.

Policies:

4. Maintain water supply requirements for fire fighting needs in accordance with the Insurance Services Office "Guide for Determination of Required Fire Flow."

5. Continue to enforce minimum road widths and clearances around structures to promote fire and safety protection and access.

3.10.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The CEQA defines a significant effect on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. According to the CEQA Guidelines, Appendix G, an impact to the public services would be considered significant if the project would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services,

(a) Fire protection;
(b) Police protection;
(c) Schools;
(d) Parks;
(e) Other public facilities.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.10-1 provides a summary of the significant and less than significant public services and utilities and energy impacts associated with specific components of the DWSP.

IMPACT STATEMENTS AND MITIGATION MEASURES

Impact PUB-1: DWSP pipeline construction could result in temporary, planned, or accidental disruption to utility services. Less than significant with mitigation for raw and treated water pipelines.

TABLE 3.10-1
SUMMARY OF IMPACTS – PUBLIC SERVICES AND UTILITIES / ENERGY

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
PUB-1: DWSP pipeline construction could result in temporary, planned, or accidental disruption to utility services.	NI	NI	LSM	NI	LSM
PUB-2: Construction in specific segments of the proposed pipeline alignments could result in utility conflicts.	NI	NI	LSM	NI	LSM
PUB-3: Pipeline construction could temporarily block access routes for city police departments, San Joaquin County Sheriff's Department, fire department, and emergency services.	NI	NI	LSM	NI	LSM
PUB-4: DWSP construction could require short-term police and fire protection services to assist in traffic management or to respond to a construction-related accident.	LSM	LSM	LSM	LSM	LSM
PUB-5: DWSP construction could result in a substantial use of nonrenewable energy resources.	LS	LS	LS	LS	LS
PUB-6: DWSP operation could result in substantial energy consumption.	LS	LS	NI	LS	NI

LSM = Less than Significant Impact with Mitigation
LS = Less than Significant Impact
NI = No Impact

Raw and Treated Water Pipelines

Utility services would be disrupted as a result of project construction. Because the typical cover for small diameter utilities ranges from 3.5 to five feet, the pipelines would be installed deeper than five feet to avoid potential conflicts with many existing and future adjacent utilities. In agricultural areas, the pipelines will have a minimum cover of seven feet. In most cases, impacts to utility services would involve temporary disruption that would not exceed one day. All utility lines and cables that would potentially be disrupted during project construction would be identified during preliminary design. As a condition of approval for either a utility excavation permit or an encroachment permit, a detailed engineering and construction plan, which thoroughly describes construction techniques and protective measures for minimizing impacts to utilities, would be prepared by the City and its contractors. This plan would require review by special service districts and utility services in the project area.

Accidental disruption of smaller utility lines and cables is potentially possible within the project area. Temporary and accidental impacts to smaller utility lines would be considered adverse, but not significant, because the affected area and duration of the impacts would be limited. However, disruptions to major utility lines would be considered significant, but mitigable. Thus, this impact would be reduced to a less than significant level with implementation of Mitigation Measure PUB-1.

Mitigation Measure PUB-1: A detailed study identifying utilities within the facility sites/alignments shall be conducted during the pre-design stages of the project. For DWSP facilities with adverse impacts, the following mitigation measures are identified:

- Utility excavation or encroachment permits shall be required from the appropriate agencies. These permits will include measures to minimize utility disruption. The City and its contractors shall comply with permit conditions, and such conditions shall be included in construction contract specifications.
- Utility locations shall be verified through field survey (potholing) and use of the Underground Service Alert services.
- Detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of the City's construction plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services.
- The City shall employ special construction techniques in areas where the water pipelines would parallel wastewater pipelines. These special measures, which will be included in the engineering specifications, shall include trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the water main.
- Residents and businesses in the project area shall be notified of planned utility service disruption two to four days in advance, in conformance with county and state standards.

Significance After Mitigation: Less than significant.

Impact PUB-2: Construction in specific segments of the proposed pipeline alignments could result in utility conflicts. Less than significant with mitigation for raw and treated water pipelines.

Raw and Treated Water Pipelines

Water, sewer, storm drain, natural gas, oil, electric, and/or communication lines are located within project area roadways, and therefore within proposed segment alignments. The proposed pipelines would run parallel to and cross under or over these utilities. Areas of high congestion and possible utility conflicts may occur at intersections where there are multiple crossing pipelines. It is not anticipated that the project would require relocation of existing utilities. The pipelines would have minimum cover of seven feet in agricultural areas and five feet in other areas to avoid potential conflict with utilities. However, the proximity of wastewater pipelines, in particular, may complicate the construction of proposed pipeline segments, as Department of Health Services (DHS) regulations require a 10-foot horizontal separation between parallel potable water and wastewater effluent lines, and a one-foot vertical separation for crossing potable water and effluent lines. These potential utility conflicts would be considered significant.

Mitigation Measure PUB-2: In order to reduce potential impacts associated with utility conflicts, the following measures shall be implemented in conjunction with Mitigation Measure PUB-1:

- Disconnected cables and lines shall be reconnected as soon as possible.
- Based on the utilities investigation to be conducted under Mitigation Measure PUB-1, the City shall consult with any entities having utility conflicts with the DWSP to negotiate relocation efforts or other plans to resolve the conflict.
- The City shall observe DHS standards which require 1) a 10-foot horizontal separation between parallel sewer and water mains (gravity or force mains); 2) one-foot vertical separation between perpendicular water and sewer line crossings. (In the event that separation requirements could not be maintained, the City shall obtain a DHS variance through provisions of sewer encasement, or other means deemed suitable by the DHS); and, 3) encasing water pipelines in protective sleeves where the pipeline crosses under or over an existing wastewater pipeline.

Significance After Mitigation: Less than significant.

Impact PUB-3: Pipeline construction could temporarily block access routes for city police departments, San Joaquin County Sheriff's Department, fire departments, and emergency services. Less than significant with mitigation for raw and treated water pipelines.

Raw and Treated Water Pipelines

Construction on all segments of each pipeline alignment would temporarily block access to police, fire, or other emergency service providers. The location of police and fire stations, hospitals, and other emergency service providers are indicated in the setting above. Most locations are more than one mile from the proposed alignment. Standard construction methods would be utilized to maintain access to all providers of emergency services. These methods are identified in Section 3.9, Transportation and Traffic. Pipeline construction along Eight Mile

Road would proceed at an average rate of 350 feet per day west of I-5 and 200 feet per day east of I-5. As a result, access to individual residences or businesses would be affected on average for one to two days. As discussed in Section 3.9, Transportation and Traffic measures will be included in the Traffic Control Plan to maintain access to individual residences and businesses. In addition, the following mitigation measures would result in a less than significant impact.

Mitigation Measure PUB-3a: The City shall coordinate with the Stockton Fire Department to maintain the required 24-hour access to Fire Station #14.

Mitigation Measure PUB-3b: In order to avoid blocking access to any nearby hospital, the City and its contractors shall schedule work on sections of the alignment so that multiple access points to the hospital are not blocked simultaneously.

Mitigation Measure PUB-3c: The City shall provide, upon request, a copy of the Traffic Control Plan to the sheriff's department, local police departments, county fire departments, and local fire departments for their review prior to construction. The City shall provide 72-hour notice to the local emergency service providers prior to construction of individual pipeline segments. Discussion on the Traffic Control Plan is provided in Section 3.9, Transportation and Traffic, under Mitigation Measure TR-1a.

Mitigation Measure PUB-3d: The City shall include, as part of construction contract specification provisions, steel trench plates at the construction site to maintain emergency access.

Significance After Mitigation: Less than significant.

Impact PUB-4: DWSP construction could require short-term police and fire protection services to assist in traffic management or to respond to a construction-related accident. Less than significant with mitigation for all DWSP facilities.

The DWSP would potentially generate a short-term demand for police and fire services if an accident were to occur as a result of the project. Project-related hazards include traffic congestion and rough road conditions, open trenches, and operation of heavy construction equipment. Construction activities would also result in interference with high-pressure gas lines and other high-voltage lines. Such activities may require response from fire units. Additionally, short-term police and/or fire protection services may be required to assist with traffic management during construction activities.

Mitigation Measure: Implementation of Mitigation Measure PUB-3c, above, will reduce potential impacts to less than significant. No additional measures will be required.

Significance After Mitigation: Less than significant.

Impact PUB-5: DWSP construction could result in a substantial use of nonrenewable energy resources. Less than significant for all DWSP facilities.

Construction would expend both direct and indirect uses of energy. Combustion of the refined petroleum products by construction equipment would be direct energy use. The energy consumed through mining and extraction of raw materials, manufacturing, and transportation to make the steel and all other materials used in project construction would be indirect energy use. The energy consumed during construction would represent irreversible consumption of finite natural energy resources.

Based on a projected daily peak of 100 construction-worker vehicle trips, project operations would result in fuel consumption of about 45 gallons per day or about 5.6 million British thermal units (Btu) per day. The maximum combined construction energy consumption would, therefore, be about 867 million Btu per day. Electricity would be used by construction equipment, such as welding machines and power tools. Energy consumed by construction power equipment would be relatively minimal.

Construction energy consumption would be a one-time impact and would not be an ongoing strain on finite natural resources. Construction would consume energy primarily in the form of fuel and would not have a significant effect on PG&E's energy resources. Therefore, energy consumption by construction activities would not be a significant impact therefore mitigation would not be required.

Mitigation: No mitigation is required.

Impact PUB-6: DWSP operation could result in substantial energy consumption. Less than significant for intake facility and WTP. No impact for the raw and treated water pipelines.

Intake Facility and WTP

Operational energy consumption for the DWSP would consist of electricity use by the intake facility and the WTP. Pumps would lift water from the intake facility and deliver it to the WTP. At the intake, three pumps at 200 horsepower would be installed initially, and six pumps would be installed at ultimate capacity. The total required lift to the WTP would be approximately 51 feet for delivery of 30 mgd through an initial 54-inch diameter pipe.

Energy demands for the transmission of treated water from the WTP at initial capacity would range from 6,900 to 7,500 kW. The pump station located at the WTP site would have an initial capacity of 30 mgd. The estimated power requirements for the WTP would be 2,630 kVA for conventional treatment and 2,700 kVA for membrane treatment. Actual energy requirements would vary depending on precise WTP siting and raw and treated water pipeline alignments.

No permanent employees or daily worker trips would be required to operate the intake system and the raw and treated water pipelines. Operation of the WTP would require a day shift of approximately 10 operations and maintenance staff.

Energy would be required for the operation of the intake facility and the WTP and would not consume substantial amounts of finite natural resources. No substantial upgrade to the existing PG&E facilities would be required for project operation. One feed would connect with the Mettler substation in the Lower Sacramento Road/Armstrong Road area. The second feed would be routed from the Hammer Lane substation. The Hammer Lane substation connection would need to be extended approximately 0.5 mile to reach the WTP site. The service voltage would be 12 kV. Therefore, the projected energy consumption for the project would be less than significant.

Raw and Treated Water Pipelines

The raw and treated water pipelines once installed would require only periodic inspection and maintenance. No permanent employees or daily worker trips would be required to operate the pipelines. Therefore, operation of the pipelines would not involve an increase in energy consumption.

Mitigation: No mitigation is required.

3.10.3 REFERENCES

City of Stockton. 2004a. City of Stockton Police Department. Available at http://www.stocktongov.com/police/. Accessed May 26, 2004.

City of Stockton. 2004b. Stockton General Plan Background Report. Chapter 12, Public Facilities.

City of Stockton. 2004c. City of Stockton Health and Social Services. Available at http://www.stocktongov.com/qualityoflife/socialservices.htm. Accessed May 21, 2004.

San Joaquin County. 1992. San Joaquin County General Plan 2010. Adopted July 29, 1992. Available at http://ceres.ca.gov/planning/counties/San_Joaquin/plans.html.

Stockton Unified School District. 2004. Available at http://www.stockton.k12.ca.us/html/map.html. Accessed May 21, 2004.

3.11 CULTURAL RESOURCES

This section provides an overview of the cultural history of the project area, a description of known cultural resources within and near the DWSP, regulatory requirements, and an analysis of potential impacts to cultural resources that could result from implementation of the DWSP.

3.11.1 SETTING

ETHNOGRAPHY

The Northern Valley Yokuts (Yokuts) aboriginally inhabited the project area. Because of the early decimation of the aboriginal populations in the San Joaquin Valley, most of the information on the Yokuts is derived from the translated accounts of Spanish military and missionaries. According to Wallace (1978), the crest of the Diablo Range on the west and the foothills of the Sierra Nevada on the east roughly defined the Yokuts territory. The southern boundary was located approximately where the San Joaquin River bends northward; while the northern boundary was roughly midway between the Calaveras and Mokelumne Rivers. The Yokuts may have been fairly recent arrivals in the San Joaquin Valley, arriving about 500 years ago.

Population estimates for the Yokuts vary from 11,000 to greater 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 numbered 30 to 40; each speaking their own dialect of the Yokuts language. The dialects when combined with the dialects of the Southern Valley Yokuts and the Foothill Yokuts formed the Yokutsan linguistic family of the Penutian Stock (Shipley, 1978).

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. Public structures were large and earth covered. Sedentism was fostered by the abundance of riverine resources in the area.

Subsistence among the Northern Valley Yokuts revolved around the waterways and marshes of the lower San Joaquin Valley. Fishing activities employed the use of dragnets, harpoons, and hook and line, which yielded salmon, white sturgeon, river perch, and other species of fish. Waterfowl and small game attracted to the water also provided a source of protein. The contribution of big game to the diet was probably minimal. Vegetal staples included acorns, tule roots, and seeds.

Goods not available locally were obtained through trade. Paiute and Shoshone groups on the eastern side of the Sierra were suppliers of obsidian (volcanic glass used for tools). Shell beads and mussels were obtained from Salinan and Coastanoan groups. Trading relations with Miwok groups yielded baskets and bows and arrows. A network of trails facilitated land transport; tule rafts were used for water transport.

Most of the Yokuts groups had their first contact with Europeans in the early 1800s, when the Spanish began exploring the Delta. The gradual erosion of the Yokuts culture began during the mission period. Epidemics of European diseases played a large role in the decimation of the native population. With the secularization of the mission and the release of neophytes, tribal and territorial adjustments were set in motion. People returned to other groups, and a number of polyglot "tribes" were formed. The final blow to the aboriginal population came with the Gold Rush and its aftermath. In the rush to the southern mines, native populations were forced out of their existing territories. Settlers in the valley applied further pressure to the native groups by altering the landforms and waterways of the area. 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 (Wallace, 1978).

PREHISTORY

Humans may have inhabited the Central Valley as early as 10,000 years ago. However, any evidence of early human use is most likely buried by alluvial deposits that accumulated during the last several thousand years. Later periods are better understood because more representation occurs in the archaeological record. Central California archaeology has been described as a series of patterns. Fredrickson (1973) defines "pattern" as an essentially non-temporal, integrative cultural unit - the general life way shared by people within a given geographic region. Three such patterns that overlap somewhat in adjoining areas are recognized for central California: the Windmiller, Berkeley, and Augustine Patterns (Fredrickson, 1973).

The Windmiller Pattern, which may represent the advent of early Penutian speaking populations, extends from approximately 4,500 to 3,000 Before Present (B.P.). This pattern was focused primarily on the lower Central Valley and Delta regions, and reflects the influence of a lacustrine or marsh adaptation. This economic stance may have pre-adapted them for the environment of the lower Sacramento-San Joaquin Valley and Delta, and they may have entered the region with this adaptation more or less fully developed.

The Berkeley Pattern extends roughly from 3,000 to 1,500 B.P. and was more widespread or at least more archaeologically visible than the preceding complex. The Berkeley Pattern placed greater emphasis on the exploitation of the acorn as a staple than the other patterns. The Berkeley Pattern initially may represent the spread of proto-Miwok and Costanoans, collectively known as Utians, from their hypothesized lower Sacramento Valley/Delta homeland (Fredrickson, 1973).

The Augustine Pattern extended temporally from circa 1,500 B.P. to European contact. The Augustine Pattern initially appeared to be largely an outgrowth of the Berkeley Pattern. However, the pattern may have become a blend of Berkeley traits and the traits carried into the state by the migration of Wintuan populations from the north (Moratto, 1984).

Several investigations have been conducted on the Central Valley prehistory in San Joaquin County. Much of the literature has supported the notion that large populations existed along the banks of major waterways, wetlands, and streams. Although many sites are more obtrusive, such as shell mounds, most of the archaeological record for the region has likely been buried beneath the vast alluvial deposits by erosion and depositional processes typical of the valley, especially over the last 9,000 years. Consequently, archaeological materials could be unexpectedly revealed during excavation throughout the Central Valley.

HISTORY

After the initial phases of exploration by the Europeans and Russians beginning in the late 1500s, an era commonly referred to as the Hispanic Stage (1769–1822) followed. This period was marked most notably by the missionization of the indigenous population and the development of presidios, civilian ranchos, and pueblos throughout California. This irrevocably changed, and in some cases decimated the California landscape and its indigenous peoples. This era effectively began the inexorable industrialization and agricultural movements of the 19th and 20th centuries. By 1822, the Mexican government gained control of California and began to wield more power over the affairs of California and its economy, which led to a greater degree of secularization of the missions and ranchos. This, in turn, led to the purchasing of various land grants, for the first time, by non-Hispanics such as John Sutter and Charles M. Weber.

In 1839, John Sutter acquired 1,000 square miles in the area where the City of Sacramento is currently located (Chartkoff and Chartkoff, 1984). Ten years later, the Gold Rush of 1849 brought about a much-punctuated change to California, particularly for the Central Valley and Bay Area. As a result, the small developing colonies in Stockton and Sacramento rapidly expanded. Captain Charles M. Weber, a German immigrant, founded the small colony of French Camp, near present-day Stockton (Marschner, 2000).

Much of the project area falls within the boundary of the *Rancho Campo de los Franceses*, a 49,000-acre land grant made to Captain Weber by the Mexican government (Marschner, 2000). Weber and his business partner William Gulnac organized a company in 1843 to form a colony at French Camp. The company established a settlement in 1845, building corrals and shelters on the peninsula in the Stockton Channel, known today as Weber Point. Emigrants were offered free land as an inducement to settle. However, due to the Mexican-American War, hostile native Americans in the area, plague, and limited food supplies, settlement was undesirable. Disappointed, Gulnac sold his property to Weber for $60.00. Weber subsequently ended up giving away the major portion of the rancho. In 1847, he laid out the town first known as Tuleburg, then Weberville and Weber's Embarcadero before it was officially renamed Stockton in honor of Naval Officer Commodore Robert F. Stockton in 1849 (Marschner, 2000).

The City experienced its most rapid growth as a result of its role as a major gold rush supply and transportation center in the mid-1800s. In 1850, the City was incorporated and by 1854, the City had grown to 7,000 inhabitants, making it the fourth largest city in the State. In the later half of the 19th century and as gold mining waned, disenchanted miners turned to agriculture, and Stockton became a major shipping point for overseas grain trade. Agriculture was also the catalyst for other related industry such as flourmills, shipyards, agricultural machinery, financial institutions, and tannery. A notable event in the history of Stockton's developing agricultural economy was the invention of the first commercially successful track-type tractor by Benjamin Holt who founded the Stockton Wheel Company in 1883 (Marschner, 2000).

Residential development resulted from Stockton's thriving agricultural economy. Owners of businesses and industries developed many of the residential neighborhoods in the central portion of the City that reflect the relative affluence of the owners. These homes, dating to the late 1800s reflect the high Victorian style (Marschner, 2000).

Shipping was an important aspect of the local economy throughout Stockton during the 20th century. This was largely due to the City's location at the edge of the San Joaquin-Sacramento River Delta and in an area conducive to transporting goods. With the incorporation of the City, the resources on Rough and Ready Island were used for reclamation and farming activities associated with the creation of the Port of Stockton. The economic evolution of Stockton during this period encouraged the development of suburbs during the latter part of the 20th century, which drew businesses and residential development to outlying areas (Marschner, 2000).

REGULATORY SETTING

Federal

Federal issuance of a permit, approval, or funding requires compliance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations. Section 106 requires federal agencies, or those they fund or permit, to consider the effects of their actions on the properties that may be eligible for listing or are listed on the National Register of Historic Places (NRHP). To determine whether an undertaking could affect NRHP-eligible properties, cultural resources (including archaeological, historical, and architectural properties) must be inventoried and evaluated for listing in the NRHP. The Section 106 review process normally involves the following four-step procedure described in detail in the Section 106 Regulations (36 CFR Part 800):

- Determine the area of potential effects, identify, and evaluate cultural resources in consultation with the State Historic Preservation Officer (SHPO) and interested parties;
- Assess the effects of the undertaking on historic properties that are eligible for inclusion in the NRHP;
- Consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties if they are to be adversely affected and notify the Advisory Council on Historic Preservation; and
- Proceed with the project according to the conditions of the agreement.

State

CEQA requires that public or private projects financed or approved by public agencies must assess the effects of the project on unique or significant historical resources. Historical resources are defined as buildings, sites, structures, objects or districts, each of which may have historical, architectural, archaeological, cultural, or scientific significance (Public Resources Code 21083.2; California Code of Regulations 15064.5).

CEQA requires that if a project results in an effect that may cause a substantial adverse change in the significance of an historical resource, then alternative plans or mitigation measures must be considered; however, only significant historical resources need to be addressed. Therefore, prior to the assessment of effects or the development of 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 a project on all eligible historical resources.

Local

San Joaquin County General Plan.

The San Joaquin County General Plan establishes policies to protect San Joaquin County's valuable architectural, historical, archaeological and cultural resources (San Joaquin County, 1992). These policies are as follows:

- The County shall continue to encourage efforts, both public and private, to preserve its historical and cultural heritage.

- Significant archaeological and historical resources shall be identified and protected from destruction. If evidence of such resources appears after development begins, an assessment shall be made of the appropriate actions to preserve or remove the resources.

- No significant architectural, historical, archaeological or cultural resources shall be knowingly destroyed through County action.

- Reuse of architecturally interesting or historical buildings shall be encouraged.

- The County shall promote public awareness of and support for historic preservation.

City of Stockton General Plan

The City's General Plan (1990) addresses cultural resources under the Open Space Element, as follows:

Goal

1. Preserve and enhance open space areas for the preservation of natural resources including plant life, habitat for fish and wildlife species, ecologically sensitive areas, and historic and cultural resources.

Policy:

6. Continue to recognize and preserve Stockton's historical and cultural resources.

City of Stockton Municipal Code

Within the purview of the City's Planning and Zoning Code, Chapter 16, Part 7 reflects the city's policies regarding cultural resource preservation (City of Stockton, 2004). The purposes of these policies are as follows:

- Designate, preserve, protect, restore, enhance, and perpetuate those historic structures, districts, sites, zones, and neighborhoods which contribute to the cultural and aesthetic benefit of the City.
- Encourage public knowledge, understanding and appreciation of, and a sense of identity with, the City's past.
- Foster civic and neighborhood pride in the beauty and accomplishments of the past.
- Stabilize and improve the economic value of historic structures, districts, zones, and neighborhoods.
- Preserve diverse architectural styles and design reflecting phases of the City's history, and encourage complementary contemporary design and construction.
- Promote and encourage continued private ownership and utilization of such buildings and other structures now so owned and used, to the extent that the objectives listed above can be attained under such policy.

The City's Municipal Code establishes rules and procedures for the Cultural Heritage Board, which was established in 1969 to assist in the preservation of the City's historic districts and landmarks. In addition, the Code establishes criteria and procedures for the designation and maintenance of landmarks and historic sites. Chapter 16, Part VII, Section 16-150 of the Stockton Municipal Code specifies that all property owners and tenants of Landmarks, Structures of Merit, and structures in a Historic Preservation District shall maintain and keep in repair such structures and premises, and shall comply with all applicable building and housing codes and other state and local laws. In addition, a Certificate of Appropriateness approved by the Community Development Director, with advice from the Cultural Heritage Board, must be obtained for the construction, demolition, alteration, removal, or relocation of any publicly or privately owned landmark, or any structure, natural feature, or site within a Historic Preservation District.

3.11.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

According to the CEQA, a project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment (CEQA rev. 1998 Section 15064.5(b)). CEQA further states that a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired. Actions that would materially impair the significance of a historic resource are any actions that would demolish or adversely alter those physical characteristics of an historical resource that convey its historical significance and qualify the resource for inclusion in the California Register of Historic Resources (CRHR) or in a local register or survey that meet the requirements of Sections 5020.1(k) and 5024.1(g) of the Public Resources Code.

METHODOLOGY

Methodology to identify cultural resources in the project area included a cultural resources record search, contacts with Native Americans, and a field survey.

A records search of all pertinent survey and site data was conducted at the Central California Information Center at California State University, Stanislaus on November 17, 2003. The records were accessed by utilizing the Bouldin Island, Terminous, and Lodi South USGS 7.5-minute quadrangle maps, Township 1N, Range 7E. The review followed the proposed intake site, WTP site, and the raw and treated water pipeline alignments along with a 0.25-mile buffer (study area). Previous surveys and studies and archaeological site records were accessed as they pertained to the study area. Records were also accessed and reviewed in the Directory of Properties in the *Historic Property Data File for San Joaquin County* for information on sites of recognized historical significance within the *NRHP*, the *CRHR*, the *California Inventory of Historic Resources* (1976), the *California Historical Landmarks* (1996), and the *California Points of Historical Interest* (1992). General Land Office plats, the Historic Bridge Survey (Caltrans, 1989 and updates), and the *Survey of Surveys* (OHP, 1989) were also reviewed for the project area.

Professional archaeologists conducted an archaeological field inspection of the project area on May 6, 2004. The surface of the project area was inspected using a combination of systematic survey transects. A cursory survey inspection was conducted in areas of low visibility and very low sensitivity. Areas of visible surface, especially in the higher sensitivity area west of I-5 and along Little Connection Slough levee, were examined for evidence of archaeological remains such as artifacts, bone, features, or culturally modified soil horizons using intensive pedestrian survey techniques. The 126-acre parcel containing the 56-acre WTP site and some portions of the treated water pipeline alignment (developed areas and areas of very low sensitivity) were examined using cursory inspection methods.

On May 10, 2004, the Native American Heritage Commission (NAHC) was contacted. The NAHC was requested to provide information on locations of importance to Native Americans and a list of Native Americans that should be contacted. The NAHC provided contact information for Katherine Perez, who should be contacted concerning locations of importance to Native Americans in the project area. A letter was sent to Katherine Perez, providing information about the proposed DWSP and requesting information on locations of importance to Native Americans.

Ms. Perez telephoned the archaeologist and indicated that some portions of the proposed DWSP area are sensitive for the presence of buried Native American archaeological sites and that those areas should be monitored during construction.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.11-1 provides a summary of the cultural resources impact associated with specific components of the DWSP.

TABLE 3.11-1
SUMMARY OF IMPACTS – CULTURAL RESOURCES

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
CUL-1: Construction of DWSP facilities could damage unidentified buried archaeological, historical, or paleontological resources within the project area.	LSM	LSM	LSM	LSM	LSM

LSM = Less than Significant Impact with Mitigation

Three prehistoric sites and no historic period sites have been recorded within a 0.25-mile of the project area, i.e., outside of the project areas.

IMPACT STATEMENTS AND MITIGATION MEASURES

Impact CUL-1: Construction of DWSP facilities could damage unidentified buried archaeological, historical, or paleontological resources within the project area. Less than significant with mitigation for all DWSP facilities.

Intake Facility

No cultural resources, including archaeological remains or historical buildings and structures, have been identified for either the in-river or in-bank intake facility sites, associated facility locations, or the construction staging area. No cultural resources have been documented at the intake site. However, because no subsurface testing was conducted, the nonexistence of subsurface cultural resources cannot be demonstrated. Unidentified, buried archaeological remains would be present at the intake site. Buried archaeological remains such as prehistoric midden deposits, flaked and ground stone artifacts, bone, shell, building foundations and walls, and other buried cultural materials would be damaged during grading, trenching, and other construction related activities. Buried human remains that were not identified during field investigations would be inadvertently unearthed during construction-related activities, which would result in damage to these remains. Damage to significant buried archaeological and/or human remains would be a significant impact. Implementation Mitigation Measure CUL-1 would reduce this impact to less than significant.

Raw and Treated Water Pipelines

No archaeological resources have been identified along the raw or treated water pipeline alignments. No archaeological resources have been documented along the pipeline alignments. However, because no subsurface testing was conducted, the nonexistence of subsurface cultural resources cannot be demonstrated. Although unlikely, unidentified, buried archaeological remains would be present along the pipeline alignments. Buried archaeological remains such as prehistoric midden deposits, flaked and ground stone artifacts, bone, shell, building foundations and walls, and other buried cultural materials would be damaged during grading, trenching, and other construction related activities. Buried human remains that were not identified during field investigations would be inadvertently unearthed during construction-related activities, which would result in damage to these remains. Damage to significant buried archaeological and/or human remains would be a significant impact. Implementation of Mitigation Measure CUL-1 would reduce this impact to less than significant.

Two potentially significant structures have been identified along the pipeline alignments: (1) the draw bridge on Eight Mile Road crossing Honker Cut, and (2) the Union Pacific Railroad tracks crossing Eight Mile Road east of Davis Road. In addition, the records search indicated that 11 cultural resource inventories and surveys have been conducted within the pipeline alignment, although only a small fraction of the footprint of the proposed alignment has been previously investigated for the presence of cultural resources (Napton, 1987; Byars, 1993; Busby et al., 1997; Jensen, 2002).

The bridge crossing Honker Cut (built in 1936) was previously evaluated for NRHP eligibility by Caltrans (1989) and was determined to be ineligible. A second draw bridge crossing Bishop Cut on Eight Mile Road was also noted; however, this bridge, built in 1989, is not potentially significant because it is less than 50 years old. Neither of these structures would be affected by the proposed DWSP. No direct or indirect effects would result from implementation of the proposed DWSP. Both of these structures would be avoided through the use of trenchless construction techniques that would tunnel beneath these structures. No physical or visual impacts would result from placement of the raw water pipelines and no mitigation is necessary.

Another potentially significant structure identified along the raw and treated water pipeline alignments is the Union Pacific Railroad tracks crossing Eight Mile Road east of Davis Road. This structure would not be affected by the pipeline alignments and no direct or indirect effects would result from implementation of the DWSP. The Union Pacific Railroad tracks would be avoided through the use of trenchless construction techniques that would tunnel beneath the tracks. No physical or visual impacts would result from placement of the treated water pipelines and no mitigation is necessary.

Water Treatment Plant

No archaeological resources or potentially significant structures have been identified in the 126-acre parcel containing the WTP site. No archaeological resources have been documented for the proposed WTP site. However, because no subsurface testing was conducted, the nonexistence of subsurface cultural resources cannot be demonstrated. Although unlikely, unidentified buried archaeological remains would be present in the WTP site. Buried archaeological remains such as prehistoric midden deposits, flaked and ground stone artifacts, bone, shell, building foundations and walls, and other buried cultural materials would be damaged during grading, trenching, and other construction related activities. Buried human remains that were not identified during field investigations would be inadvertently unearthed during construction-related activities, which would result in damage to these remains. Damage to significant buried archaeological and/or human remains would be a significant impact. Implementation of Mitigation Measure CUL-1 would reduce this impact to less than significant.

A farm house and two buildings were identified on the 126-acre parcel containing the WTP site. Although these buildings may be over 50 years old, they do not appear to be potentially significant because they have been extensively modified in recent times, are in very poor condition, appear to have been moved from their original location, and are not unique structures but are standard farm labor buildings.

Mitigation Measure CUL-1: Work shall be stopped in affected areas if cultural resources are discovered during project construction and appropriate measures will be implemented.

Pursuant to CEQA Guidelines 15064.5 (f), "provisions for historical or unique archaeological resources accidentally discovered during construction" shall be instituted. Therefore, in the event that any prehistoric or historic subsurface cultural resources are discovered during ground disturbing activities, all work potentially affecting the resources shall be halted and the project proponent and/or lead agency shall consult with a qualified archaeologist or paleontologist to assess the significance of the find. If any find is determined to be significant, representatives of the project proponent and/or lead agency and the qualified archaeologist and/or paleontologist shall meet to determine the appropriate avoidance measures or other appropriate mitigation. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards.

If the discovery includes human remains, CEQA Guidelines 15064.5 (e)(1) shall be followed:

(e) In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps shall be taken:

   (1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

      (A) The San Joaquin County coroner must be contacted to determine that no investigation of the cause of death is required, and

      (B) If the coroner determines the remains to be Native American:

1. The coroner shall contact the NAHC within 24 hours.

2. The NAHC shall identify the person or persons it believes to be the most likely descended from the deceased Native American.

3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or

(2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

(A) The NAHC is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.

(B) The descendant identified fails to make a recommendation; or

(C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the NAHC fails to provide measures acceptable to the landowner.

Significance After Mitigation: Less than significant.

3.11.3 REFERENCES

Busby, C. I., et al. 1997. Cultural Resources Assessment, San Joaquin Area Flood Control Restoration Plan. On file at the Central California Information Center, Turlock, CA: File # 3130.

Byars, M. A., 1993. A Cultural Resources Study of the North Stockton Projects Annexation, San Joaquin County. On file at the Central California Information Center, Turlock, CA: File # 1998.

California Department of Parks and Recreation. 2003. *California Historical Landmarks.* The Resources Agency, Department of Parks and Recreation, Sacramento, California.

California Department of Parks and Recreation. 2003. *California Points of Historical Interest.* The Resources Agency, Department of Parks and Recreation, Sacramento, California.

California Department of Transportation (Caltrans). 1989 and updates. Historic Bridge Survey. Available at: http://www.dot.ca.gov/hq/structur/strmaint/historic.htm

California Office of Historic Preservation (OHP). 1989. Survey of Surveys: A Summary of California's Historical and Architectural Resource Surveys.

Chartkoff, J. L., and K. K. Chartkoff. 1984. The Archaeology of California. Stanford University Press, Stanford, California.

City of Stockton. 1990. City of Stockton General Plan: Policy Document. Adopted January 22, 1990; last amended November 3, 1998.

City of Stockton. 2004. Planning and Zoning Code, Chapter 16, Part 7.

Fredrickson, D. A. 1973. Early Cultures of the North Coast Ranges, California. Ph.D. dissertation. Department of Anthropology, University of California, Davis.

Jensen, P. M. 2002. Archaeological Inventory Survey, Proposed North Stockton Development Project. On file at the Central California Information Center, Turlock, CA: File # 4755.

Marschner, J. 2000. *California 1850:* A Snapshot in Time. Coleman Ranch Press, Sacramento, California.

Moratto, M. J. 1984. California Archaeology. Academic Press, Orlando, Florida.

Napton, L. K. 1987. Cultural Resource Investigation of the Proposed 1285-Acre Spanos Park Project, Stockton, San Joaquin County, California. On file at the Central California Information Center, Turlock, CA: File # 778.

San Joaquin County. 1992. San Joaquin County General Plan 2010. Adopted July 29, 1992. Available at http://ceres.ca.gov/planning/counties/San_Joaquin/plans.html.

Shipley, W. F. 1978. "Native Languages in California." *Handbook of North American Indians.* Volume 8, *California*. R. F. Heizer, volume editor. Smithsonian Institution, Washington, DC.

Wallace, W. J. 1978. "Northern Valley Yokuts." *Handbook of North American Indians.* Volume 8, *California*. R. F. Heizer, volume editor. Smithsonian Institution, Washington, DC.

3.12 CUMULATIVE IMPACTS

An EIR must discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects (CEQA Guidelines Section 15130[a]). CEQA Guidelines Section 15130(b) requires that the discussion of cumulative impacts reflect the severity of the impacts and their likelihood of occurrence. The CEQA Guidelines note that the cumulative impacts discussion does not need to provide as much detail as is provided in the analysis of project-only impacts and should be guided by the standards of practicality and reasonableness.

In addition, Section 15130(b) of the CEQA Guidelines identifies that the following three elements are necessary for an adequate cumulative impact analysis:

- Either: (A) a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the Lead Agency (i.e., the list approach); or (B) a summary of projections contained in an adopted general plan or related planning document designed to evaluate regional or area-wide conditions (i.e., the plan approach). Any such planning document shall be referenced and made available to the public at a location specified by the Lead Agency.

- A summary of expected environmental effects to be produced by those projects. The summary shall include specific reference to additional information stating where that information is available.

- A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable options for mitigating or avoiding any significant cumulative effects of a Proposed Project.

3.12.1 APPROACH

This analysis uses the "list" method described above for identifying potential cumulative impacts. Table 3.12-1 provides a list of projects that may affect similar environmental resources as the DWSP. However, certain cumulative analyses also incorporate local or regional projections in order to more fully address potentially significant effects. Therefore, this section also incorporates the adopted City's 1990 General Plan EIR by reference (City of Stockton, 1990). The potentially significant environmental effects identified in the General Plan EIR are listed in Table 3.12-2 (City of Stockton, 1990). The City's General Plan is also discussed in Chapter 6, Growth Inducement Potential and Secondary Effects of Growth. The General Plan EIR cannot be solely relied upon for the DWSP analysis, as many of the facilities are outside of the 1990 General Plan's study area.

The projects in Table 3.12-1 are either (a) within the vicinity of the DWSP facilities; or (b) of a similar nature (infrastructure improvements) to the DWSP. The identified projects are under construction, have been recently approved, or are pending approval.

TABLE 3.12-1
PROPOSED AND APPROVED PROJECTS IN VICINITY OF PROPOSED DWSP

Name of Project	Acreage	Location	Description of Project	Status
North Stockton Subdivisions	352	South of Eight Mile Road, west of Thornton Road	1,516 residential units and 168,000 SF commercial.	52% complete for all projects
Spanos Park West	258	Eight Mile Road, west of I-5	1,198 residential units 1,000,000 SF retail center	81% complete
Morada Ranch	39	Hammer Lane and Holman Road	Commercial Development (Wal-Mart)	
Westlake Villages (Spanos)	688	Bishop Tract	2,630 single family residential development	Approved
Sphere of Influence (SOI) Amendment Nos. 1 and 2	5,615	North Stockton	5,615-acre addition to Stockton SOI, including 4,451 acres of Bishop and Shima Tracts	SOI approved
Eight Mile Road Improvements	--	Eight Mile Road east and west of I-5	(1) Widening of Eight Mile Road to 110 feet between Trinity Parkway and I-5; (2) freeway interchange improvements including installation of 30-inch diameter sewer line; and (3) half width widening (55 feet) between I-5 and east side of Oak Grove Regional Park	Under construction
System 9 Wastewater Collection System	--	NE Stockton (SR 99 south of Hammer Lane)	Wastewater collection system for 2,900-acre future growth area	Design phase
Regional Wastewater Control Facility	--	SW Stockton (SR 4 and Daggett Road)	Wastewater treatment plant upgrades to meet water quality standards and restore 48 mgd treatment capacity	Project approved
South Stockton Aqueduct	--	SE Stockton, from Gillis & Main to Pock & Togninali	5.1-mile long pipeline connecting SEWD WTP with the existing City water distribution system	Construction to begin in 2005
Hammer Lane/ SR 99 Improvements	--	Hammer Lane and SR 99	Freeway interchange reconstruction; widening of overpass to eight lanes, widening of SR 99 to 6 lanes from Hammer Lane to SR 4	Construction to begin in 2005
El Dorado Street/ March Lane Intersection Improvements	--	El Dorado St., north and south of March Lane	Intersection reconstruction and widening of El Dorado Street at March Lane	Under construction, 75% complete
March Lane Extension	--	March Lane, between SR 99 and West Lane	Extension of March Lane to SR 99	Design phase

SOURCE: Environmental Science Associates, 2005

TABLE 3.12-2
CITY OF STOCKTON 1990 GENERAL PLAN EIR ENVIRONMENTAL EFFECTS

Issue	Impact	Significance
Land Use	Potential land use compatibility problems; conflicts between residential, commercial, and industrial uses.	LSM
	Potential for proposed annexations in the future growth areas to conflict with LAFCO policies related to City service plans and prime agricultural lands.	LSM
	Potential conflict with San Joaquin County General Plan Land Use Element map and policies.	LSM
Population and Employment	Population and employment growth are a fundamental determinant of the wide range of impacts resulting from urban growth.	SU
Housing	Potential for General Plan to designate an inadequate supply of developable land for housing (causes price of land to rise, which affects affordability and availability of housing).	LSM
	Lack of affordable housing (affects supply of housing for persons of low and moderate incomes).	Unknown[1]
	Governmental constraints affect the supply, distribution, and cost of housing.	LSM
	Deterioration of housing stock/neighborhoods in the older areas of the City (affects amount of housing available for low and moderate incomes).	LSM
	Lack of accessibility to housing for the elderly, minorities, handicapped, the homeless, and others with special needs.	Unknown[1]
Topography, Geology, and Soil	Potential hazards to new and existing structures due to the earthquakes and development on organic peat soils and expansive clay soils.	LSM
Agricultural Resources	Eventual development of the future growth areas would result in the loss of about 9,000 acres of agricultural land, approximately one-half of which is considered to be prime farmland. The inducement of urban growth onto agricultural land beyond the planned urban boundary is also possible.	SU
	Conflicts and incompatibility between agricultural and urban uses, including dust, smoke, pesticides, noise from agricultural operations impinging on urban uses, and the potential for nearby urban residents to trespass upon, litter, or vandalize agricultural land and equipment.	SU
	Parcelization of agricultural land on the fringe of Stockton into units too small to maintain agricultural viability.	LSM
Biological Resources	Development in accordance with the proposed General Plan would result in the eventual loss of over 9,000 acres of agricultural land and potential wildlife habitat within the future growth areas, about 3,300 acres of which is considered to be within or on the fringe of the Delta. The Delta, with its wetlands and waterways, provides the most sensitive and highest value wildlife and plant habitat in the planning area. The Delta is home to a number of special status species, provides an important wintering area for migrating water fowl, and is an important fishery. Agricultural land is also an important source of food and cover for wildlife, including special status species.	SU
	The remaining Valley Oak trees within the planned growth areas may be lost if they are not properly incorporated into new development.	LSM
	Construction of the western beltway road in the Delta beyond the western boundary of the planning area would adversely impact biological resources in terms of direct construction-related impacts, and more significantly, from the potential of the roadway to induce urban growth further west in the Delta. (The western beltway is not shown in the proposed General Plan but was included in the traffic analysis at the request of the Public Works Department.)	LSM

TABLE 3.12-2 (Continued)
CITY OF STOCKTON 1990 GENERAL PLAN EIR SIGNIFICANT ENVIRONMENTAL EFFECTS

Issue	Impact	Significance
Transportation	The projected increase in traffic volumes would result in a number of capacity deficiencies on a number of existing streets and freeway segments (as noted on Tables J-7 and J-8 of the EIR).	SU
	Improper design of the street system can create adverse impacts on surrounding land uses and safety problems, such as through traffic being routed through residential neighborhoods, lack of design for speed restriction, lack of off-street parking, too many access points to arterial streets and inadequate right-of-way widths and dedications.	LSM
	Impacts related to the western beltway road are summarized under Biological Resources.	LSM
	A greater demand for public transportation services will be created as urbanization occurs in the future growth areas.	LSM
	As growth continues to occur in the Stockton area, it will be important to assure and promote convenient and safe non-motorized transportation in the form of pedestrian and bikeway facilities. Not planning for these transportation modes can act to discourage these non-polluting alternatives to automobile use.	LSM
	Stockton has a substantial number of at-grade railroad crossings, which can be a safety and convenience problem, as well as block emergency vehicle access to an area. Railroads are also a significant source of noise due to train engine and wheel noise, brakes whistles and signals, and switching activities.	LSM
	The operation of an airport has the potential to result in significant noise and safety problems in relation to surrounding land uses.	LSM
	The industrial and shipping activities in the Port area would be incompatible with residential land uses.	LSM
Air Quality	The Stockton area currently exceeds federal and state standards for carbon monoxide (CO), ozone, and particulates. Development in accordance with the proposed General Plan and master plans will significantly worsen the extent to which these standards are exceeded due to a substantial increase in vehicular and stationary pollutant sources and will add to both local and regional air quality problems.	SU
	Based upon traffic projections and air quality modeling , the 8-hour federal and state air quality standards for carbon monoxide(CO) are projected to be exceeded at three major street intersections (West Lane/Hammer Lane, Thornton Road/Hammer Lane and West Lane/March Lane) in the year 2010 assuming buildout of the proposed General Plan.	SU
Noise	Noise from freeways and major streets, railroads and railroad yards, industrial operations, and airports may adversely impact residential and other noise sensitive land uses proximate to these noise sources. The noise contours along the freeways and many major streets will significantly increase with the projected increase in vehicular traffic.	SU (for freeway and major streets)
Water Supply and Quality	Depletion of groundwater table beyond safe yield.	LSM
	Inadequate supply of surface water to serve long-term projected growth.	LSM
	Lack of capital facilities to distribute and deliver water in and efficient and effective manner.	LSM
	Increased saline groundwater intrusion in the western portion of the planning area.	LSM
	Potential for migration of groundwater contaminated with pesticides into the planning area.	LSM

TABLE 3.12-2 (Continued)
CITY OF STOCKTON 1990 GENERAL PLAN EIR SIGNIFICANT ENVIRONMENTAL EFFECTS

Issue	Impact	Significance
	Potential surface and groundwater contamination could result from urban runoff and the use and storage of hazardous materials by commercial industrial and institutional uses.	LSM
Wastewater Collection and Treatment	Potential for growth inducement within and beyond areas planned for urban expansion. A 6,000 acre area is designated for agriculture in south Stockton that was master planned for urban-level sewer services.	SU
	Potential to overload the wastewater collection and treatment system, which can lead to overflows and backups in the collection system and exceedence of the capacity of the treatment plant, causing inadequately treated sewage to be discharged into the San Joaquin River.	LSM
	Generation of hydrogen sulfide in sewer lines, which can corrode concrete and steel, and pose a safety and odor problem.	LSM
	Direct impacts from the actual construction of sewer lines and facilities, such as noise, dust, traffic disruption, utility line disruption safety hazards, and disturbance of below surface cultural resources.	LSM
	The disposal of sludge has the potential to result in adverse environmental impacts in terms of potential groundwater contamination from the sludge lagoons and the landfill site.	LSM
Flood Control	Portions of the existing community and portions of the future growth areas are subject to flood hazards (within a 100-year flood zone) from inadequate levees adjacent to the Delta and along the various watercourses traversing the metropolitan area.	LSM
Solid Waste	The City's Austin Road Landfill is nearing capacity and will either need to be expanded or a new site will have to be established prior to the mid-1990s.	LSM
	The continued discard of recyclable items by homes and businesses results in the use of more landfill space than necessary and also wastes substantial amounts of raw material resources and energy.	LSM
	The groundwater in the vicinity of the Austin Road Landfill is being contaminated by toxic substances originating from the landfill.	LSM
Law Enforcement	Additional growth and development will place greater demands on law enforcement personnel and resources. The current (FY 89–90) number of sworn employees is 245. The Police Department anticipates the need for a staff of 486 officers by 2005. The growth in employees will worsen the need for headquarters expansion, which is estimated to cost $15.3 million.	LSM
	With increased growth and development in the western portion of the planning area adjacent to the Delta and associated waterways, the Department is concerned that these areas could be subject to theft and vandalism related to waterway access.	LSM
	Potential for inadequate emergency access to new development.	LSM
	Potential for inadequate security features and defensible space design in new development.	LSM
	Potential for the theft and vandalism during the construction process.	LSM
Fire Protection and Emergency Services	Additional fire stations will be needed in north and south Stockton to accommodate projected urban growth and development.	LSM
	Potential for inadequate emergency access to new development.	LSM

TABLE 3.12-2 (Continued)
CITY OF STOCKTON 1990 GENERAL PLAN EIR SIGNIFICANT ENVIRONMENTAL EFFECTS

Issue	Impact	Significance
Schools	Full development of the future growth areas of the proposed General Plan would theoretically result in the generation of about 44,000 additional K-12 students and a need for 27 elementary schools, seven middle schools, and six high schools. Continued strong growth will perpetuate existing overcrowding and facility shortage problems.	LSM
Parks and Recreation	Urbanization of the future growth areas as set forth in the proposed General Plan will create a need for new parks and recreation facilities in these areas, including community centers. The proposed General Plan map depicts 18 new neighborhood parks and nine new community parks within the future growth areas.	LSM
	Regional park acreage is currently deficient (based upon a standard of 8 acres per 1,000 persons) and would not improve significantly under the proposed General Plan given the fact that, except for the 45 acre sports park to be provided in the Spanos Park project, no additional regional park acreage is provided.	LSM
Utilities: Electricity, Gas, Telephone, and Cable TV	Residential and commercial development of the future growth areas in accordance with the land use designations of the proposed General Plan would result in a 39 percent increase in natural gas usage and a 35 percent increase in electrical usage as compared to existing usage. (PG&E indicates that it will have no problem serving the future growth areas, however their facilities would need to be upgraded and additional substations would be required).	LSM
	The generation of electrical power involves the use of substantial amounts of non-renewable fossil fuels. Natural gas is also a non-renewable resource.	SU
Library Services	Projected growth will create the need for two new branch libraries in north Stockton and a new branch library in south Stockton.	LSM
Hazardous Materials	Improper storage, disposal, transport, and use of hazardous materials, including chemicals, solvents, petroleum products, natural gas, pesticides, heavy metals, explosives and radioactive materials can result in air, soil, and groundwater contamination, as well as pose a serious safety hazard.	LSM
Aesthetics	The rural, pastoral view for those living on the urban fringe would eventually be lost due to urban development.	SU
	The view along highways may present negative image of the City to highway travelers.	LSM
	New development may occur in a manner that results in a negative aesthetic impact.	LSM
	Deterioration of the older areas of the City will have a negative aesthetic effect.	LSM
Cultural Resources	Undiscovered cultural resources existing in the future growth areas may be disturbed by construction activities associated with new development.	LSM
Fiscal	Public facility capital costs to accommodate new development may put an extreme financial burden on the City.	LSM
	Build-out of the future growth areas could create the need for 27 new elementary schools, seven new middle schools, and 6 new high schools, which could put a substantial financial burden on affected school districts.	LSM

[1] Significance of certain housing impacts is identified as unknown in the General Plan EIR.
SU = Significant unavoidable.
LSM = Less than significant with mitigation.
SOURCE: City of Stockton, 1990

The DWSP vicinity with respect to proposed facilities encompasses North Stockton and the unincorporated area between the Cities of Stockton and Lodi. This geographic scope is based on the reasonable likelihood of DWSP environmental effects overlapping or interacting with effects from the other identified projects. This area extends approximately two miles from the proposed DWSP facilities and is bordered by Hammer Lane to the South, the Lodi city limits (Harney Lane) to the north, SR 99 to the east, and Little Connection Slough to the west. Certain environmental impacts required consideration of a larger geographic area. For example, air quality impacts were examined at the level of the air basin. In addition, infrastructure projects have been included in Table 3.12-1 because they are similar in nature to the DWSP, even though they may be located outside of the project vicinity.

3.12.2 CUMULATIVE IMPACTS

The following section discusses potential cumulative impacts related to the construction and operation of the DWSP. Cumulative impacts to Delta resources are addressed separately in Chapter 4, Delta Water Resources and Fisheries. In addition, cumulative impacts to groundwater are addressed in Chapter 5, Groundwater Resources.

SUMMARY OF IMPACTS BY PROJECT COMPONENT

Table 3.12-3 provides a summary of the cumulative impacts associated with specific DWSP facilities.

TABLE 3.12-3
SUMMARY OF IMPACTS – CUMULATIVE IMPACTS

Impact	In-River Intake Facility	In-Bank Intake Facility	Raw Water Pipelines	Water Treatment Plant	Treated Water Pipelines
CUM-1: Implementation of the DWSP would contribute to the cumulative loss of important farmland in San Joaquin County.	LSM	LSM	LSM	LSM	LSM
CUM-2: Construction activities associated with the proposed DWSP facilities would temporarily generate cumulatively considerable levels of PM_{10} and ozone precursor (ROG and NO_x) emissions to the SJVAB.	SU	SU	SU	SU	SU

LSM = Less than Significant Impact with Mitigation
SU= Significant Unavoidable Impact

LAND USE, AGRICULTURE, RECREATION AND AESTHETICS

The approved projects identified in Table 3.12-1 are consistent with the City's 1990 General Plan. As discussed in Section 3.2, Land Use, Recreation, Aesthetic Resources of this EIR, the DWSP would not conflict with existing and planned land uses surrounding the project, nor would it physically divide an established community. Therefore, the DWSP would not contribute to a cumulative land use impact.

Residential development identified in Table 3.12-1 will contribute to a cumulative impact to recreational facilities by requiring new or expanded facilities. These impacts will be mitigated to less than significant through the dedication of land or payment of fees per Government Code 66477 (Quimby Act). The DWSP would not create additional demand for recreational facilities. Impacts caused by construction of the DWSP to recreation facilities (access) would be temporary, and would not contribute to a cumulative recreational impact.

San Joaquin County contains 626,404 acres of important farmland (CDOC, 2002). In 1992, the County contained 635, 655 acres of important farmland (CDOC, 1996). These data show an average net loss of 925 acres of important farmland per year has occurred over the past 10 years.[1] Full development of the projects, listed in Table 3.12-1, would result in a significant cumulative loss of important farmland (approximately 1,200 acres). The construction of the WTP would convert 56 acres of important farmland (six acres of Prime Farmland, 50.02 acres of Farmland of Statewide Importance) to non-agricultural use - a significant direct impact (Impact LU-5). Based on the incremental effects of the listed projects, and the overall amount of farmland lost each year in the County, the DWSP would contribute to a significant cumulative impact. As discussed in Section 3.2, Land Use, Recreation, and Aesthetic Resources, Mitigation Measure LU-5b would require acquisition of agricultural conservation easements on a 1:1 basis for important farmland converted by the DWSP. By protecting important farmland within the County, the DWSP's contribution to a cumulative impact would be mitigated to less than significant.

The City's 1990 General Plan EIR identifies the conversion of agricultural and open space on the urban edge as a significant cumulative visual impact (City of Stockton, 1990). Several of the residential and commercial projects identified in Table 3.12-1 would contribute to this cumulative effect. This EIR identifies significant impacts to aesthetic resources associated with the proposed DWSP intake facility, including impacts within a scenic route (Empire Tract Road and degradation of visual quality at the intake facility (Impact LU-10), and creation of a substantial new source of nighttime lighting in the Delta and at the WTP site (Impact LU-11). Despite proposed mitigation measures, these impacts would remain significant unavoidable at the intake and WTP sites. However, because none of the projects identified in Table 3.12-1 would be located within the same viewshed as the intake facility and WTP, the visual impact caused by the

[1] During this reporting period, 1992–2002, an annual average of 5,547 acres of important farmland was converted to other uses and 4,603 acres were gained through conversion from other uses, particularly grazing land. However, most agricultural land converted to non-agricultural uses tends to be prime farmland or farmland of statewide importance, while most "new" farmland is classified as unique or locally important farmland—a lower classification of farmland.

intake and WTP would not act in a cumulative manner with the other listed projects. The WTP would have a less than significant visual impact, as discussed in Impact LU-10. The WTP would be effectively screened from public view, and would not contribute to the cumulative loss of open space views north of Eight Mile Road. Therefore, the DWSP would not contribute to a significant visual cumulative impact.

Impact CUM-1: Implementation of the DWSP would contribute to the cumulative loss of important farmland in San Joaquin County. Less than significant with mitigation for all DWSP facilities.

Mitigation Measure CUM-1: Implement Mitigation Measure LU-5b –contribute in-lieu fees to a ”farmland trust” fund for San Joaquin County for future acquisition of equivalent ACEs.

Significance After Mitigation: Less than significant with mitigation.

GEOLOGY, SOILS, AND SEISMICITY

Construction of the DWSP would involve soil-disturbing activities and vegetation removal that could lead to accelerated erosion (Impact GEO-1). Erosion has the potential to affect agricultural productivity in the DWSP vicinity and result in sedimentation of local surface waters. The projects identified in Table 3.12-1 would result in similar erosion impacts during construction. These projects would be required to comply with Section 13-501 of the City's Municipal Code, the Grading and Erosion Control Ordinance. In addition, projects that would disturb one acre or more would be subject to the requirements of an NPDES storm water construction permit. The City must submit a Notice of Intent to the RWQCB prior to the beginning of construction to be covered by the General Construction Permit. The General Storm Water Construction Permit requires the preparation of a SWPPP before construction begins. The SWPPP includes specifications for BMPs to be implemented during construction to control contamination of surface flows. Implementation of the SWPPP starts with the commencement of construction and continues through the completion of the project.

Potential cumulative erosion and sedimentation impacts would be reduced to less than significant through implementation of local and state requirements and use of BMPs. The DWSP would also comply with these requirements, as discussed in Mitigation Measure GEO-1.

Potential seismic hazards identified for the DWSP would be reduced to less than significant through implementation of standard mitigation measures (Mitigation Measure GEO-2). The implementation of other projects in the cumulative setting would neither increase nor decrease seismic risk for persons or structures in the vicinity.

Therefore, the DWSP would not contribute to a significant cumulative impact related to geology, soils, and seismicity.

DRAINAGE AND FLOODPLAIN MANAGEMENT

Drainage impacts are related to soil-disturbing activities and vegetation removal activities, as discussed above. The mitigation measures for erosion control discussed previously also serve as mitigation for drainage impacts during construction. These measures are incorporated into the DWSP as Mitigation Measure GEO-1.

The DWSP would not contribute to a significant cumulative impact with regard to floodplain management, as discussed in Impact DFM-5. Of the DWSP facilities, the intake facility and a portion of the raw water pipeline would be located within a potential 100-year floodplain. The measures incorporated into the DWSP as Mitigation Measure DFM-5 would ensure that the intake facility and raw water pipeline would not interfere with 100-year flood flows or expose additional people to a 100-year flood event.

Therefore, the DWSP would not contribute to a significant cumulative impact related to drainage and floodplain management.

BIOLOGICAL RESOURCES

Cumulative loss of wildlife habitat is identified as a significant impact in the City's 1990 General Plan EIR, particularly for sensitive habitats located within the Delta. The development projects identified in Table 3.12-1, would in many cases contribute to this cumulative loss of habitat. They would mostly generate temporary impacts to the habitat due to construction. However, certain projects, such as housing development or road widening, may contribute to permanent significant cumulative habitat impacts resulting from habitat loss.

Impacts to biological resources are discussed in Section 3.5, Biological Resources of this EIR. Potentially significant impacts, including loss of wetlands, impacts to special status species, and impacts to riparian habitats would be reduced to less than significant through implementation of mitigation measures. The DWSP would not result in a net loss of wetlands; therefore, it would not contribute to a cumulative impact to this sensitive habitat. Similarly, by avoiding sensitive riparian habitat, the DWSP would not contribute to a cumulative effect on this resource.

The project would result in the conversion of 56 acres of agricultural land for the WTP site and 0.2 acre for the raw water pipeline appurtenant facilities. Agricultural fields may provide habitat for certain special-status species, as discussed in Impact BIO-2. Implementation of Mitigation Measure BIO-2, which provides several potential actions to minimize impacts if sensitive plants are present on the facility sites, would provide compensation for any permanent habitat loss, thus rendering the project's incremental contribution to a cumulative impact less than considerable.

AIR QUALITY

The DWSP lies within the San Joaquin Valley Air Basin (SJVAB). The SJVAB is highly susceptible to pollutant accumulation over time due to the region's topographic features that restrict air movement through and out of the basin. The SJVAB is designated as "severe nonattainment" and "nonattainment" for the State standards for ozone and PM_{10}, respectively (SJVAPCD, 2004). With respect to federal standards, the SJVAB is designated as "extreme nonattainment" and "serious nonattainment" for ozone and PM_{10}, respectively (SJVAPCD, 2004). San Joaquin County is considered "attainment" for the state CO standard and "unclassified or attainment" for the federal CO standard.

Both the federal CAA and the state CAA require "nonattainment" areas to prepare plans that include strategies for achieving attainment. The SJVAPCD has prepared a PM_{10} Attainment Plan (PM_{10} Plan), updated in 2003, that lists rules and regulations to achieve the federal PM_{10} standards. The SJVAPCD also has attainment plans for ozone and hazardous air pollutants.

Section 3.6, Air Quality**,** identifies potentially significant air quality impacts resulting from DWSP construction (Impact AIR-1) and operation of the WTP (Impact AIR-2). On a project level, the construction-related impacts would be reduced to less than significant by implementation of fugitive dust control measures pursuant to SJVAPCD Regulation VIII. The operation of the WTP would be subject to SJVAPCD permit requirements, including chemical scrubbers and controls on the use of diesel back-up generators, which would reduce this impact to less than significant.

The SJVAPCD does not currently recommend a quantitative analysis of cumulative PM_{10} emissions (SJVAPCD, 2002b). Instead, cumulative analysis should examine the potential PM_{10} exposure to sensitive receptors near the project site from earth-disturbing activities from construction of the DWSP and any nearby projects that may occur at the same time. If it appears that the level of activity may cause an adverse impact, the project should implement enhanced dust control measures listed in the SJVAPCD Guidelines (2002b), in addition to the Regulation VIII measures, to reduce the impact to less than significant.

The DWSP's cumulative air quality emissions impacts were evaluated using the SJVAPCD's 2002 Guide for Assessing and Mitigating Air Quality Impacts (SJVAPCD, 2002a; b). This analysis considers the possibility that construction could also have a cumulative impact on ozone precursors (ROG and NO_x). Construction-related PM_{10} impacts may be cumulatively significant in combination with other construction projects in the vicinity (Table 3.12-1).

The City's 1990 General Plan found that air quality emissions would be a significant unavoidable impact of the General Plan build-out due to the generation of vehicular and stationary source air pollution. Because of the current and projected nonattainment status of the SJVAB, addition of the DWSP and other cumulative projects (over 7,000 acres are listed in Table 3.12-1) would increase air pollutant emissions in the SJVAB and make it difficult for the SJVAB to attain air quality standards for PM_{10} and ozone. This would be a significant cumulative air quality impact.

During the two-year construction phase, the DWSP would generate PM_{10}, ROG, and NOx emissions during each active day of construction. These emissions would be considerable at times during construction and would be a significant cumulative air quality impact. The project's construction impact would be considered cumulatively considerable because (1) the SJVAB is severe nonattainment already, and although mitigated by SJVAPCD Regulation VIII, (2) project construction would occur on all days, including days with PM_{10} and ozone already in excess of state standards. After construction, the air emissions from the DWSP on-going operations would not be cumulatively considerable.

Impact CUM-2: Construction activities associated with the proposed DWSP facilities would temporarily generate cumulatively considerable levels of PM_{10} and ozone precursor (ROG and NO_x) emissions to the SJVAB. Significant unavoidable for all DWSP facilities.

Mitigation Measure CUM-2: The City shall implement appropriate SJVAPCD enhanced additional control measures (SJVAPCD, 2002b). These measures may include the following:

1. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent;
2. Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site;
3. Install wind breaks at windward side(s) of construction areas;
4. Suspend excavation and grading activity when winds exceed 20 mph; (regardless of wind speed, an owner/operator must comply with Regulation VIII's 20 percent opacity limitation);
5. Limit area subject to excavation, grading, and other construction activity at any one time;

6, Minimize construction equipment idling time (e.g., 10 minute maximum);

Significance After Mitigation: Significant unavoidable.

NOISE

Cumulative noise impacts may result from simultaneous construction activities, or the operation of the proposed DWSP when considered with other increases in ambient noise levels. The projects identified in Table 3.12-1 would cause temporary increases in noise due to construction activity. In addition, the projects would contribute to permanent increases in the ambient noise level, primarily due to additional vehicle traffic.

The DWSP would create a significant, although temporary, noise impact during construction (Impact Noise-1). This impact would be reduced to less than significant through the implementation of Mitigation Measure Noise-1. The installation of the raw and treated water pipelines would potentially occur in the same area and time frame as some of the projects identified in Table 3.12-1. However, pipeline installation would occur at a more rapid pace compared to the projects identified in Table 3.12-1 (approximately 200 feet per day east of I-5 and 350 feet per day west of I-5). The relatively brief amount of construction time affecting a particular sensitive receptor, and the implementation of Mitigation Measure Noise-1 would result in a less than considerable cumulative contribution to construction noise impacts.

Operational noise impacts of the DWSP would be concentrated at the intake and WTP facilities. Both of these impacts would be less than significant with mitigation measures incorporated. The projects identified in Table 3.12-1 would not be close enough to the intake or WTP facilities to increase ambient noise levels at those sites.

Therefore, the DWSP would not contribute to a significant cumulative noise impact.

HAZARDOUS MATERIALS/PUBLIC HEALTH

Hazardous materials/public health impacts related to construction projects include disturbance of contaminated soil and/or groundwater, and accidental releases of hazardous materials used in the construction process, such as gasoline or diesel fuel, oil, and solvents. Standard mitigation measures, identified in Section 3.8, Hazardous Materials/Public Health of this EIR (HAZ-1 and HAZ-2) would reduce this impact to less than significant. Similar requirements are standard for all large excavation and construction projects, including those identified in Table 3.12-1.

Potential health impacts from the operation of the DWSP would include hazards associated with the storage and use of toxic materials at the WTP facility. These materials, and appropriate mitigation measures, are discussed in Impact HAZ-3. This impact would be less than significant with implementation of Mitigation Measure HAZ-3. None of the projects identified in Table 3.12-1 are similar in type or location to the WTP facility to create a cumulatively significant impact.

Cumulative impacts related to hazardous materials and/or public health would be less than significant.

TRANSPORTATION AND TRAFFIC

The residential and commercial projects identified in Table 3.12-1 would contribute to a significant cumulative traffic impact in the vicinity of the DWSP, particularly Eight Mile Road. Currently, Eight Mile Road operates at an unacceptable level of service (LOS), defined as LOS E or F from Lower Sacramento Road to West Lane. The intersection of Eight Mile Road and Davis Road operates at an unacceptable LOS (City of Stockton, 2004). Without mitigation, it is projected that most of Eight Mile Road will operate at an unacceptable LOS in the future (City of Stockton, 1990). Planned improvements (intersection and roadway improvements) will allow Eight Mile Road to operate at an acceptable LOS (City of Stockton, 1990). The projects identified in Table 3.12-1 will be required to contribute to off-site traffic improvements according to a fair share formula. This mitigation would reduce the cumulative impact of development in the project vicinity to less than significant.

Identified traffic impacts resulting from the construction of the project include temporary interruptions of traffic flow (Impact TR-1) and the degradation of the roadways used by construction vehicles (Impact TR-6). Temporary disruptions of traffic can be mitigated by proper traffic controls in the construction zone. The City intends to repair roadways damaged by construction of the DWSP. Other projects in the vicinity would be required to implement similar traffic controls and to schedule lane closures to prevent conflicts with other projects affecting the same roadway. Private development projects would be required to obtain encroachment permits or enter into development agreements, which would ensure any public roadways damaged during construction would be repaired. Therefore, with mitigation, cumulative impacts with regard to construction activity would be less than significant.

Traffic impacts resulting from continued operation and maintenance of the DWSP were found to be less than significant. Daily trips for the DWSP would be mainly to and from the WTP facility; however, daily trips would amount to less than 60 trips per day. According to the City's 1990 General Plan projections, Eight Mile Road and other major streets in the DWSP vicinity will accommodate at least 20,000 vehicles per day (City of Stockton, 1990). Sixty vehicle trips, which represent less than 0.3 percent of this amount, would not be a sufficient increase in trips to affect the future LOS on the affected streets. Therefore, the DWSP would not contribute to a significant cumulative effect as related to transportation and traffic.

PUBLIC SERVICES AND UTILITIES/ENERGY

Potential impacts on public services that could result from the DWSP, discussed in Section 3.10, Public Services and Utilities/Energy, would be primarily related to disruption of utility services or interference with emergency response during project construction. These impacts would be reduced to less than significant through implementation of mitigation measures during DWSP construction. Other projects identified in Table 3.12-1 could interfere with emergency response during construction. These projects would require traffic control measures, and identification of underground utilities for any work performed in the public right of way. These standard mitigation measures would reduce the potential for a cumulative, considerable disruption to utility service or interference with emergency response due to construction activity.

The operation of the DWSP would not require additional public services, such as emergency fire, medical, or police response; schools; parks, or community services; nor would it require expansion of the existing energy infrastructure. Therefore, the DWSP would not contribute to a cumulative impact as related to public services.

CULTURAL RESOURCES

No identified historical or significant cultural resources have been identified within the vicinity of the DWSP. Nevertheless, the accidental discovery of archeological, historical or paleontological resources is identified as a potentially significant impact (Impact CUL-1). However, this impact would be reduced to less than significant through application of appropriate mitigation measures. The projects identified in Table 3.12-1 may have similar impacts to undiscovered resources.

However, standard mitigation measures and reporting procedures (as identified in CEQA Guidelines Section 15064.5) would apply to these projects, resulting in a less than significant cumulative impact to cultural resources.

3.12.3 REFERENCES

California Department of Conservation (CDOC). 1996. Farmland Mapping and Monitoring Program. Farmland Conversion Report 1992 – 1994.

California Department of Conservation (CDOC). 2002. Farmland Mapping and Monitoring Program. Farmland Conversion Report 1998 – 2000.

City of Stockton. 1990. City of Stockton General Plan Revision and Infrastructure/Public Facilities Master Plans EIR. Certified January 22, 1990.

City of Stockton. 2004. City of Stockton General Plan Background Report. February 2004.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2002a. Guide for Assessing and Mitigating Air Quality Impacts, Technical Document, Information for Preparing Air Quality Section in EIRs, Public Draft.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2002b. Guide for Assessing and Mitigating Air Quality Impacts, Public Draft.

San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). 2004. Ambient Air Quality Standards & Valley Attainment Status. Available at: http://www.valleyair.org/aqinfo/attainment.htm